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Appendix B9

Construction Waste and Resources Management Sub-plan

M12 Motorway

May 2024

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Document control

File Name	M12PPW-ADAP-ALL-EN-PLN-000010_J_S3 _CWRMP
Title	M12 Motorway OCEMP Appendix B9 – Construction Waste and Resources Management Sub-plan
Document Number	M12PPW-ADAP-ALL-EN-PLN-000010

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Tracey Austin TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
Date 28.06.2024	Date 28/6/2024
Signed [redacted]	Signed [redacted]

Revision history

Revision	Date	Description
A	16/09/2020	First draft for TfNSW review
B	14/10/2020	Response to TfNSW comments
C	30/10/2020	Response to TfNSW comments
D	23/07/2021	Updated with Final NSW CoA
E	04/11/2021	Response to TfNSW and ER comments
F	15/11/2022	Additional design changes updates
G	13/02/2023	Response to TfNSW comments
H	21/03/2023	Response to ER comments
I	10/01/2024	Updated to reflect additional CAs
I.1	18/01/2024	Updated to address minor comments
J	09/04/2024	Updated to address comment from TfNSW, ER and Construction Contractors

J.1	06/05/2024	Updated to address minor comments

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Glossary/Abbreviations

Abbreviations	Expanded text
AEIs	Areas of Environmental Interest
AMP	Asbestos Management Plan
AR	Amendment Report
ARSR	Amendment Report to the Submissions Report
ASS	Acid Sulfate Soil
CCLMP	Construction Contaminated Land Management Sub-plan
CFFMP	Construction Flora and Fauna Management Sub-plan
CMS	Complaints Management System
CoA	Conditions of Approval
Construction	Includes all activities required to construct the CSSI as described in the documents listed in Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix A and approved under an environmental management plan(s) in accordance with Condition A24.
CSSI	Critical State Significant Infrastructure
CTTMP	Construction Transport and Traffic Management Plan
CWRMP	Construction Waste and Resources Management Sub-plan
CWSMP	Construction Soils and Water Management Plan
DAWE	Former Commonwealth Department of the Water, Agriculture and Environment
DECCW	Former Department of Environment, Climate Change and Water
DPE	Former Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI, with all planning functions falling to DPHI)
DPI	Department of Primary Industries
DPIE	Former Department of Planning, Industry and Environment
EDC	Elizabeth Drive Connection

Abbreviations	Expanded text
EES	Former Environment, Energy and Science Group
EHG	Environment and Heritage Group (a part of NSW DCCEEW)
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EMS	Environmental Management System
ENM	Excavated Natural Material, as defined in *The excavated natural material exemption*

Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway - Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway - Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW

Abbreviations	Expanded text
	• Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
Environmental Representative	A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. A key point of contact for the Planning Secretary in relation to environmental performance of the CSSI.
ESR	Construction Contractor Environmental Site Representative
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environmental Protection Licence
ERG	Environmental Review Group
ESM	Transport for New South Wales Environment and Sustainability Manager
EWMS	Environmental Work Method Statements
FCC	Fairfield City Council
GHG	Greenhouse Gas
GREP	NSW Government Resource Efficiency Policy
ISCA	Infrastructure Sustainability Council of Australia
IS	Infrastructure Sustainability
LCC	Liverpool City Council
M7 Motorway (MOD 6 Widening)	Refers to the State Significant Infrastructure project (SSI-663-MOD 6) to construct and operate an additional lane in both directions within the existing median of the M7 Motorway, south of the Kurrajong Road overhead bridge at Prestons to the M7 Motorway bridge at Richmond. This project interacts with the M12 East stage at the M7 interchange.
M7 Widening	Shorthand term for M7 Motorway (MOD 6 Widening)

Abbreviations	Expanded text
M7-M12 Integration Project	The M7-M12 Integration project incorporates the following: • M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) • M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the EP&A Act and split into separate stages or packages of work (West, Central (main construction), Central (temporary roundabout) and East). The M12 Motorway is also subject to a federal approval under the Environment Protection and Biodiversity Conversation Act 1999. The M7-M12 Integration project incorporates the M12 East package only.
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NSW CoA	NSW Conditions of Approval
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW DPE which has now been split into NSW DCCEEW and NSW DPHI)
OCEMP	Overarching Construction Environmental Management Plan
OCS	Overarching Communication Strategy
OEH	Former NSW Office of Environment and Heritage; now EES
PCC	Penrith City Council
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Planning Secretary	Secretary of the NSW Department of Infrastructure, Planning and Environment, or delegate
Primary CoA/REMM	CoA/REMM that are specific to the development of this Plan
RAP	Reclaimed asphalt pavement
REMM	Revised Environmental Management Measures
Resource	Resource covers energy, fuel, oil, water and other materials used for construction of the Project
RID Squad	Regional illegal dumping squad
Roads and Maritime	Former NSW Roads and Maritime Services. Now Transport for NSW
SEARs	Secretary's Environmental Assessment Requirements
Secondary CoA/REMM	CoA/REMM that are related to, but not specific to, the development of this Plan
SEMP	Site Establishment Management Plan

Abbreviations	Expanded text
SMP	Spoil Management Plan
tCO_2-e	Tonnes of CO_2 equivalent
TfNSW	Transport for New South Wales (formerly Roads and Maritime Services (RMS))
VENM	Virgin Excavated Natural Material
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
Work	Any physical work to build or facilitate the building of the CSSI, including low impact work, environmental management measures and utility works. However, it does not include activities that inform or enable detailed design of the CSSI and generate noise that is no more than 5 dB(A) above the rating background level at any sensitive receiver.
WRAPP	Waste Reduction and Purchasing Policy
WSIA	Western Sydney International Airport
WSP	Western Sydney Parklands

1 Introduction

1.1 Context

This Construction Waste and Resources Management Sub-plan (CWRMP or Plan) forms part of the Overarching Construction Environmental Management Plan (OCEMP) for the M12 Motorway (the Project).

This CWRMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, and Amendment Report Submissions report (ARSR), all applicable legislation and Transport for New South Wales (TfNSW) specifications.

1.2 Background

TfNSW is planning to construct and operate the M12 Motorway (the Project) to provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network. The M12 Motorway will run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres and is expected to be opened to traffic prior to opening of the WSIA.

The Project will be constructed in separate stages under separate construction contracts:

- M12 West – between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- M12 Central (main construction) – between about 250 metres east of Badgerys Creek and the Western Sydney Parklands at Duff Road, Cecil Park
- M12 Central (Temporary Roundabout) - temporary roundabout installation at Elizabeth Drive and Devonshire Road, Kemps Creek
- M12 East – (as part of the M7/M12 Integration Project)
    - Elizabeth Drive Connections (EDC) – a two-kilometre section from Duff Road to about 300 metres east of the M7 Motorway
    - M7/M12 Interchange – An interchange between the M12 Motorway and M7 Motorway and tie-in works for approximately four kilometres on the M7 Motorway

The Project is subject to an approval under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The Project is also a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), requiring a separate approval from the Australian Minister for the Environment.

An EIS was prepared to describe and assess the Project and recommended management measures to address impacts. The EIS was exhibited by the Former NSW Department of Planning,

Industry and Environment[1] (DPIE) for 34 days from 16 October 2019 to 18 November 2019 to give the community and stakeholders the opportunity to provide comment.

In accordance with Section 5.17 of the EP&A Act, the Planning Secretary requested TfNSW to provide a response to submissions. These were addressed within the Submission Report. Due to design developments since the exhibition of the EIS, an Amendment Report has been developed to assess the impacts of these amendments. The Amendment Report was exhibited by DPIE for 14 days from 21 October 2020 to 4 November 2020. Following exhibition of the Amendment Report, an ARSR was developed in December 2020 to provide a response to submissions on the Amendment Report. Further supplementary information was provided via an amendment to the ARSR in March 2021. Collectively the EIS, Submissions Report, Amendment Report, ARSR and ARSR amendment are herein referred to as Environmental Assessment Documentation.

The following additional assessments have since been undertaken:

- Two Consistency Assessments (CA) for M12 West and Central addressing detailed design changes for the Project construction boundary approved in October 2021
- Sydney Water Consistency Assessment related to construction boundary extensions associated with Sydney Water utility crossings; approved in June 2022
- Design Boundary Change Consistency Assessment related to design boundary changes within the M12 alignment. This required an extension of the construction footprint and operational footprint, property adjustments and the demolition of Building No.1 at McMasters Field Station; approved in July 2022. Threatened Species Surveys were also undertaken along the M12 alignment between September and December 2021 to satisfy the NSW Conditions of Approval (CoA) E4, E5 and E6; the outcomes of which captured within the Design CA.
- Minor Consistency Assessment (M12 Central) required amendments to the construction footprint as a result of utility adjustments and tie in works, property adjustments for flood alleviation and improvements to ancillary facility access due to safety concerns, temporary widening of Elizabeth Drive and signage installation; approved in August 2022.
- Devonshire Road Temporary Roundabout Consistency Assessment required to address the requirements of REMM TT10. This has resulted in an increase to the construction footprint at the Elizabeth Drive and Devonshire Road intersection to allow for the construction of a temporary roundabout; approved in September 2023.
- Elizabeth Drive Connections Consistency Assessment addressed detailed design changes for the Elizabeth Drive Connections. This involved minor construction and operation boundary adjustments, design changes, new sediment basin locations, utility works, property access changes and property adjustments; approved in September 2023.
- M12 West Minor Consistency Assessment for the demolition of structures as 752 Luddenham Road required to address the need for the demolition of structures within Ancillary Facility 11. Whilst this ancillary facility is already located within the construction footprint and was previously assessed in the M12 Motorway Amendment Report, the demolition and disposal of structures in this location required assessment; approved in September 2023.

[1] Now split into two departments, NSW Department of Planning, Housing and Infrastructure (DPHI) and NSW Department of Climate Change, Energy, Environment and Water (NSW DCCEEW)

- M12 East AF9 Power Supply Minor Consistency Assessment required to address a minor temporary amendment to the construction footprint in order to provide permanent site power to the construction ancillary facility 9 (AF9); approved in October 2023.
- M12 East Cecil Road Laydown Area Minor Consistency Assessment required to address temporary amendment to the construction boundary to facilitate the installation of a DN150 Steel Secondary Gas main within Cecil Road; approved in October 2023.
- M12 East Temporary Construction Signage Minor Consistency Assessment required to address temporary traffic signage installed prior to the start of temporary barriers on the M7 Motorway; approved in October 2023.
- M12 East Sites 48, 50 and 51 Boundary Changes Minor Consistency Assessment addressed the required amendments to the construction footprint in three locations as a result of temporary traffic control measures, pavement build up and resurfacing; approved in December 2023.
- M12 Central Water Tower Access Road Minor Consistency Assessment addressed changes to the construction boundary to facilitate the construction of concrete slabs over the Sydney Water main, the construction of a temporary access road to the existing water town and radar tower, and the subsequent reinstatement of this temporary access road to pre-construction conditions; approved in January 2024.

The Project must be carried out generally in accordance with the EIS, Submissions Report, AR, ARSR and the ARSR - Amendment, M12 West and Central CA, Sydney Water CA, Design Boundary Change CA, Minor CA, Devonshire Road Temporary Roundabout CA, Elizabeth Drive Connections CA, M12 West Demolition of Structures as 752 Luddenham Road CA, M12 East AF9 Power Supply CA, M12 East Cecil Road Laydown Area CA, M12 East Temporary Construction Signage CA, M12 East Sites 48, 50 and 51 CA and M12 Central Water Tower Access Road CA in accordance with NSW CoA A1. These documents are collectively referred to as the Environmental Assessment Documentation (EAD). The CSSI must also be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the EAD as required by NSW CoA A2.

Approval for the Project under the EP&A Act was granted by the Minister for Planning on 23 April 2021 (SSI 9364). Approval for the Project under the EPBC Act was granted by the Federal Minister for the Environment on 3 June 2021 (EPBC 2018/8286).

As part of EIS development, a detailed waste and resources assessment was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by DPIE and the Commonwealth EIS Guidelines issued by the Commonwealth Department of the Water, Agriculture and Environment (DAWE).

Further assessment of waste and resources impacts was undertaken subsequent to exhibition of the EIS as part of the Amendment Report for the Project. The additional assessment considered the impacts on waste and resources due to refinements in the Project design, including changes in the Project footprint. Revised Environmental Management Measures (REMMs) were provided within the Amendment Report and ARSR. Where applicable, the REMMs from the Amendment Report and ARSR have been included in this CWRMP (Section 3 and Appendix A).

Additionally, the M12 East Stage is being delivered as part of the M7-M12 Integration Project which includes the M7 Motorway Widening Project (MOD 6 Widening (SSI-663-MOD 6)) (referred to herein as M7 Widening) delivered by Western Sydney Orbital Company (WSO Co). Additional assessments were undertaken as a part of the EAD for this project.

Further, design development has progressed, providing additional environmental assessment, and where relevant, this detail has been included within this Plan. Section 2 of the OCEMP provides a detailed Project description.

1.3 Scope of the Plan

The OCEMP and Sub-plans are related to the construction phase only. Early Works, as defined in Appendix B of the State Infrastructure Approval and Section 2.3 of the OCEMP, are not within the scope of the OCEMP and Sub-plans. Notwithstanding, where Early Works activities are undertaken during the construction phase, they will be governed by the approved OCEMP and Sub-plans.

The scope of this CWRMP is to describe how the Construction Contractors propose to manage potential waste and resource impacts during construction of the Project. The Construction Contractor responsible for each stage of the Project; M12 West, M12 Central (main construction), M12 Central (temporary roundabout), M12 East (Elizabeth Drive connections) and M12 East (M7/M12 interchange) must use this CWRMP as the basis for their sta

ge-specific CWRMP.

Operational waste and resources impacts and operation measures do not fall within the scope of this CWRMP and are therefore not included within the processes contained within the CWRMP.

1.4 Environmental Management Systems overview

The overarching Environmental Management System (EMS) for the Project is described in Section 3 of the OCEMP. The Construction Contractor delivering the Project will have an EMS consistent with the overarching EMS described in the OCEMP and will develop stage-specific CWRMPs in accordance with the OCEMP, the Environment Protection Licence (EPL) and their EMS.

This CWRMP forms part of the environmental management framework for the Project, as described in Section 3.3 of the OCEMP.

The Construction Contractor will be required to develop, as part of their stage-specific CWRMPs, detailed procedures and plans to address specific requirements of the CoA and REMMs identified in this overarching CWRMP.

The CWRMP should be read in conjunction with the Sustainability Strategy. The Sustainability Strategy includes objectives and targets for the delivery of the Project commitments to sustainability and that are relevant and complementary to the management measures outlined in this CWRMP. Stage specific plans and strategies will be prepared by the Construction Contractor for the Construction Contractor's Sustainability Strategy.

Management measures identified in this CWRMP may also be incorporated into site or activity specific Environmental Work Method Statements (EWMS). EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with the EWMS. A template EWMS for use by the Construction Contractor is provided in Appendix A8 of the OCEMP.

EWMS will be prepared by the Construction Contractor Environmental Site Representative (ESR) and reviewed by the TfNSW Environment and Sustainability Manager (ESM) (or delegate) and independent Environmental Representative (ER) prior to the commencement of the construction activities to which they apply. Construction personnel undertaking a task governed by an EWMS

will undertake the activity in accordance with the mitigation and management measures identified in the EWMS.

Used together, the OCEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by TfNSW and its Construction Contractor.

The review and document control processes for this CWRMP are described in Section 7 of the OCEMP. TfNSW will review the Construction Contractors documentation to confirm consistency with the requirements of this CWRMP and specifications.

1.4.1 CWRMP preparation, endorsement and approval

This overarching CWRMP has been prepared to satisfy the NSW CoA's in relation to management of waste and resource during construction of the Project.

This CWRMP was reviewed by the TfNSW Senior Project Manager and the ESM and endorsed by the ER prior to submission to the Planning Secretary of the Department of Planning and Environment (DPE; now DPHI) for approval, which was received on 21st December 2021. This CWRMP was submitted for the approval of the Planning Secretary no later than one month before commencement of construction of the Project, or as otherwise agreed by the Planning Secretary in accordance with NSW CoA C3.

In accordance with NSW CoA C10, construction of the Project did not commence before approval of the CWRMP by the Planning Secretary.

1.4.2 Interactions with other management plans

This Plan has the following interrelationships with other management plans and documents:

- The Construction Soil and Water Management Plan (CWSMP) addresses the erosion and sedimentation impacts associated with waste storage and handling as well as procedures for minimising water usage and managing wastewater and any contaminated waste including Acid Sulfate Soils (ASS) encountered during construction works
- The Spoil Management Plan (SMP) provides specific details for the management of spoil from construction works
- The Construction Contaminated Land Management Plan (CCLMP) provides detail for pre- and post-construction waste found within the Project footprint and disposal methods for any contaminated waste
- The Construction Flora and Fauna Management Plan (CFFMP) addresses reuse and recycling of green waste generated from vegetation clearing operations
- The Construction Transport and Traffic Management Plan (CTTMP) addresses the transportation and traffic impacts of waste transport and disposal
- The Sustainability Strategy sets out a framework covering energy management, workforce travel, resource use and procurement and water reuse
- The Construction Water Strategy sets out a framework to address Environmental Assessment Documentation and Infrastructure Sustainability Council of Australia (ISCA) requirements
- The Site Establishment Management Plan(s) (SEMP) include details of specific waste management locations as well as site specific management requirements

2 Purpose and objectives

2.1 Purpose

The purpose of this CWRMP is to describe how waste and resources will be protected and managed during construction of the Project.

2.2 Objectives

The objective of the CWRMP is to ensure that waste and resource impacts are managed appropriately throughout construction of the Project and consider mitigation and management measures referred to in:

- The Environmental Assessment Documentation prepared for M12 Motorway
- NSW CoA granted to the Project on 23 April 2021
- Commonwealth CoA granted to the Project on 3 June 2021
- TfNSW Specifications.

To achieve this objective, the Construction Contractors will:

- Ensure measures are identified and implemented to minimise and manage waste and conserve energy throughout the construction of the Project
- Ensure the preferred waste management hierarchy of avoidance, minimisation, reuse, recycling and finally disposal, is followed
- Provide site personnel with an increased level of understanding and awareness of waste and resources use management
- Ensure appropriate measures are implemented to address the requirements of the CoA outlined in Table 3-1 and the REMMs detailed in Table 7-1
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3 of this CWRMP.

2.3 Targets

TfNSW and its Construction Contractors are committed to ensuring the responsible management of unavoidable waste and promoting the reuse of such waste in accordance with the resource management hierarchy principles outlined in the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). The targets established for the management of waste and resources impacts during the Project are consistent with these resource management hierarchy principles, which are, in order of priority:

- Avoid the unnecessary production of waste during construction
- Resource recovery (including reuse, reprocessing, recycling and energy recovery)
- Dispose of waste materials in accordance with legislative requirements.

By adopting the above principles, the Construction Contractor aims to efficiently reduce resource use, reduce costs, and reduce environmental harm in accordance with the principles of ecologically sustainable development.

The following additional targets have been established for the management of waste impacts during construction of the Project:

- Minimise energy use and greenhouse gas emissions
- Optimise resource efficiency and waste management
- Efficiently manage water
- Minimise pollution generated by the Project.

Additionally, the Project will achieve the waste reuse / recycling targets nominated in Table 2-1 based on TfNSW Sustainability Strategy 2019-2023 for resource use and waste management targets (RMS, 2021).

Table 2-1: Construction waste streams and targets

Construction activity	Material	Minimum TfNSW Target	Target description
Demolition	Uncontaminated non-spoil (clean concrete and asphalt)	• 100% of clean concrete will be used for beneficial reuse • 100% of clean reclaimed asphalt pavement will be recycled	• Minimise the use of non-renewable resources and substitute with recycled or reused materials, cost effective and affordable, where possible. • Minimise the quantity of waste disposed to landfill.
Excavation	Usable spoil	• 100% of uncontaminated VENM will be reused on site • An average of 95% of usable spoil (non-VENM) will be reused and/or recycled across each stage	
Construction	Concrete	• An average of 10% cement replacement material in concrete (by mass) whilst maintaining specified quality and whole-of life-costs will be used for each stage	• Minimise the use of non-renewable resources and substitute with recycled or reused materials, cost effective and affordable, where possible. • Minimise the quantity of waste disposed to landfill. • Procure goods, services, materials and works for infrastructure development and maintenance Projects that over their lifecycle deliver value for money and contribute to the environmental, social and economic wellbeing of the community
	Road base, sub-base	• An average of 10% recycled content by volume will be used for each stage • An average of 40% of recycled material used in granular base and sub base will be used for each stage of the Project	
	Steel	• Source from suppliers certified under Australian Certification Authority for Reinforcing Steels or similar international association or organisation	

Construction activity	Material	Minimum TfNSW Target	Target description
Vegetation clearance	Uncontaminated material	• Green waste will be reused and/or recycled where possible	• Minimise the use of non-renewable resources and substitute with recycled or reused materials, cost effective and affordable, where possible • Minimise the quantity of waste disposed to landfill
Energy use	Electricity	• An average of 20% of renewable energy generated will be onsite and/or accredited GreenPower • A reduction of carbon emissions will be adopted for each stage of the Project	• Minimise energy use and reduce carbon emissions without compromising the delivery of services to our customers
Water use	Potable water	• An average of 33% of non-potable water across each stage • An average of 5% rainwater will be collected and recycled across each stage	• Minimise noise, water and land pollution from TfNSW construction, operation and maintenance activities

The overarching Sustainability Strategy embeds sustainability objectives, commitments and targets into the Project delivery management systems. The Sustainability Strategy complements the purpose, objectives and targets of the CWRMP.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

All legislation relevant to this Plan is included in Appendix A1 of the OCEMP. Legislation considered during the development of this Plan includes:

- *Environmental Planning and Assessment Act 1979* (EP& A Act)
- *Protection of the Environment Operations Act 1997 (*POEO Act*)*
- *Protection of the Environment Operations (General) Regulation 2009*
- *Protection of the Environment Operations (Waste) Regulation 2005*
- *Waste Avoidance and Resource Recovery Act 2001 (*WARR Act*)*
- *Dangerous Goods (Road and Rail Transport) Act 2008 (NSW)*
- Dangerous Goods (Road and Rail Transport) Regulation 2014 (NSW)
- *Contaminated Land Management Act 1997*
- *National Greenhouse and Energy Reporting Act 2007 (*NGER Act*)*
- *Biosecurity Act 2015*
- *Environmentally Hazardous Chemicals Act 1985.*

3.1.2 Additional approvals, licences permits and requirements

Refer to Appendix A1 of the OCEMP.

3.1.3 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this CWRMP include:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (Environment Protection Authority (EPA), 2014)
- *Waste Classification Guidelines* (EPA, 2014) *NSW Government Resource Efficiency Policy* (Office of Environment and Heritage, 2014)
- *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2008)
- *Environmental Sustainability Strategy 2019-2023* (Roads and Maritime, 2021)
- *Management of wastes on TfNSW land* (TfNSW, 2014)
- *Management of road construction and maintenance wastes* (TfNSW, 2016)
- *Technical Direction: Legal offsite disposal of TfNSW waste* (TfNSW, 2015)
- *Technical Direction: Coal tar asphalt handling and disposal* (TfNSW, 2015)
- *Stockpile Site Management Guideline* (TfNSW, 2011)
- *Greenhouse Gas Protocol* (World Business Council for Sustainable Development and World Resources Institute, 2004)

- Transport for NSW waste fact sheets:
  - Waste Fact Sheet 1 - Virgin Excavated Natural Material
  - Waste Fact Sheet 2 - Excavated Natural Material
  - Waste Fact Sheet 3 - Excavated Public Road Materials
  - Waste Fact Sheet 4 - Recovered Aggregates
  - Waste Fact Sheet 5 - Asbestos Waste
  - Waste Fact Sheet 6 - Waste Sampling
  - Waste Fact Sheet 7 - Reclaimed Asphalt Pavement
  - Waste Fact Sheet 9 - Re-use of Waste Off-site.
- NSW EPA orders and exemptions, including:
  - Compost Exemption 2016
  - Effluent Exemption 2014
  - Pasteurised Garden Organics Exemption 2016
  - The Excavated Natural Material Exemption 2014
  - The Excavated Public Road Material Exemption 2014
  - The Mulch Exemption 2016
  - The Recovered Aggregate Exemption 2014
  - The Blast Furnace Slag Exemption 2014
  - The Reclaimed Asphalt Pavement Exemption 2014
  - Treated Drilling Mud Exemption 2011
  - Stormwater Exemption 2014.

PS311 – Environmental Design and Compliance.

3.2 NSW Conditions of Approval

There are no primary CoA associated with this Plan. Refer to Appendix A for Secondary CoA.

3.3 Revised Environmental Management Measures

The primary REMMs relevant to the development of this Plan are listed in Table 3-1 below. Secondary REMMs relevant to this Plan are listed in Appendix A. A cross reference is also included to indicate where the REMM is addressed in this Plan or other Project management documents.

Table 3-1: Environmental management measures relevant to this CWRMP

ID	Measure/requirement	Timing	M12 West	M12 Central	M12 East	CWRMP Reference
W01	A Construction Waste and Resources Management Plan (CWRMP) will be prepared for the Project and outline appropriate management procedures. It will include, but not be limited to:	Prior to construction	✓	✓	✓	This CWRMP
	• Identification of the waste types and volumes that are likely to be generated by the Project		✓	✓	✓	Section 4.1
	• Adherence to the waste minimisation hierarchy principles of avoid/reduce/ reuse/recycle/dispose		✓	✓	✓	Section 5.12
	• Waste management procedures to manage the handling and disposal of waste, including unsuitable material or unexpected waste volumes		✓	✓	✓	Section 5
	• Identification of reporting requirements and procedures for tracking of waste types and quantities		✓	✓	✓	Section 8.6
	• A resource management strategy detailing the process to identify reuse options for surplus materials		✓	✓	✓	Section 6
	• A procurement strategy to minimise unnecessary consumption of materials and waste generation in accordance with relevant legislation and guidelines.		✓	✓	✓	Section 6.4

ID	Measure/requirement	Timing	M12 West	M12 Central	M12 East	CWRMP Reference
W02	A Spoil Management Plan (SMP) will be prepared for the Project as part of the CWRMP and in line with the CSWMP. The SMP will outline appropriate management procedures for the generation and importation of spoil. It will include, but not be limited to: • Procedures for classification of spoil	Prior to construction	✓	✓	✓	Appendix C
	• Identification of spoil reuse measures		✓	✓	✓	
	• Spoil stockpile management procedures		✓	✓	✓	
	• Spoil haulage routes		✓	✓	✓	
	• Spoil disposal and reuse locations		✓	✓	✓	
	• Imported spoil sources and volumes		✓	✓	✓	

3.4 TfNSW Specifications

TfNSW Specifications are a key source of environmental protection management processes relevant to this CWRMP. The TfNSW Specifications are Project contract documents and are not publicly accessible.

The TfNSW Specifications set out the minimum requirements for the detailed outcomes in terms of quality or performance expected in the finished product for construction projects and are relevant to various construction activities on work sites to minimise impacts to the environment.

The specifications set out environmental protection requirements, including Hold Points that must be complied with by the Construction Contractor during construction of the Project. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW.

The Construction Contractor will incorporate the appropriate M12 TfNSW Specifications into the stage specific CWRMPs:

- TfNSW G36 – Environmental Protection
- TfNSW R178 – Vegetation
- TfNSW R179 – Landscape Planting
- TfNSW G1 Annexure L – Sustainability Requirements
- TfNSW G3051 – Granular Pavement Base and Subbase Materials.

4 Environmental aspects and impacts

4.1 Construction waste streams

Waste generated during construction will primarily be from civil works associated with site preparation, relocation of utilities, construction of road infrastructure and landscaping.

The following construction related waste streams have been identified during the EIS:

- Surplus construction material including fencing, geofabrics, sediment, concrete, steel, timber and sand bags
- Excavated materials including spoil
- Vegetation waste from the removal of trees, shrubs and ground cover
- Excavated spoil unsuitable for reuse including contaminated spoil
- Contaminated water
- Demolition materials including concrete, bricks, road base, tiles, timber (untreated and treated), metals, plasterboard, carpets, electrical and plumbing fittings and furnishing (doors, windows). May also include tyres, asbestos and lead paint
- General construction waste including timber formwork, scrap metal, steel, concrete, plasterboards, and packaging material (crates, pallets, cartons, plastics and wrapping material)
- Surplus construction material including fencing, sediment, gravel/crushed rock, asphalt, concrete, steel, aggregate, formwork, asphalt, landscaping material and sand bags
- Sediment and sludge within sediment basins
- General waste from site offices including putrescibles, paper, cardboard, e-waste plastics, glass, site litter, cigarette butts, printer cartridges and sewage waste
- Waste from operation and maintenance of construction vehicles and machinery including adhesives, lubricants, waste fuels, cleaning products and chemicals, and oils, engine coolant, batteries, hoses and tyres
- Clean up waste in the event of an accidental spill of fuel or chemicals.

The Construction Contractor's CWRMP will confirm the waste types to be generated and provide estimations of how much of each waste type will be generated for each stage of the Project.

4.2 Resource use

The main construction materials required for the Project include:

- Fill for earthworks (general and select)
- Sand and soils for landscaping
- Geotextile materials
- Pavement materials including road base and sub-base
- Materials for lining drainage channels
- Aggregate for concrete, asphalt and bitumen

- Cement and concrete and pre-cast concrete (pipes, culverts, barriers)
- Steel
- Wood for use in formwork and other temporary structures
- Water for dust suppression, compaction of excavated fill material, gravel pavements, road sweepers, office amenities and landscape establishment
- Mechanical and electrical equipment for Variable Message Signs.

4.3 Energy use

Energy use during construction of the Project will result from the manufacture, processing and transport of materials (concrete, steel, asphalt, aggregate, timber, and piping), from the use of electricity, diesel and other fuels, waste generated, and land use and clearing.

Sources of construction related energy consumption (fuel and power) for the Project include:

- Procurement and delivery of materials to site
- Vegetation removal
- Site establishment, including compound and ancillary facility set up
- Operation of the concrete batching plant
- Relocation and protection of services
- Earthworks including earth and rock cuttings and retaining walls
- Removal, relocation and compaction of excavated material in fill embankments
- Construction of pavements, bridges and culverts
- Demolition of structures and pavements
- Operation of site compounds, ancillary facilities and lighting
- Construction plant including cranes, rollers, excavators, bulldozers, graders and water trucks
- Removal of waste from site.

4.4 Greenhouse gas emissions

The main sources of greenhouse gas (GHG) emissions during construction of the Project include:

- Construction vehicles and plant
- Use of construction materials
- Vegetation clearing.

The GHG Assessment presented in the Environmental Assessment Documentation was undertaken in accordance with the Greenhouse Gas Protocol (World Business Council for Sustainable Development and World Resources Institute, 2004). The Protocol provides guidance on the calculation and reporting of carbon footprints and defines three categories for GHG emissions:

- **Scope 1** – direct emissions from sources that are owned or operated by a reporting organisation (e.g. combustion of diesel in company owned vehicles or used in on-site generators)
- **Scope 2** – indirect emissions associated with the import of energy from another source (e.g. importation of electricity or heat)
- **Scope 3** – other indirect emissions (other than Scope 2 energy imports) which are a direct result of the operations of the organisation but from sources not owned or operated by them (e.g. business travel (by air or rail) and product usage).

Table 4-1 provides a summary of the construction GHG emissions estimated in the AR. The Construction Contractor will update the GHG Assessment in Table 4-1 as required for the Construction Contractor's CWRMPs. Note that no Scope 2 GHG emissions, as defined by the GHG Protocol, are estimated for the Project.

Table 4-1: Construction GHG emissions (tonnes of CO_2 equivalent (tCO_2-e)) presented in the Amendment Report

Emission Source	Scope 1 emission (tCO_2-e)	Scope 2 emission (tCO_2-e)	Scope 3 emissions (tCO_2-e)	Total emissions (tCO_2-e)	% of total emissions
Amendment report total construction emissions	148,441	-	193,774	342,225	100
Per cent of total	43%	0%	57%	100%	-

4.5 Impacts

The potential environmental impacts associated with construction waste generation and energy use for the Project include:

- Generation of large volumes of construction waste, such as excavated soil and rock
- Mixing of suitable and unsuitable material/contaminated material leading to materials that would have ordinarily been reused being rendered as waste
- Generation of vegetation waste from corridor clearing
- Generation of domestic waste from construction personnel
- Inappropriate disposal of hazardous waste
- Generation or spread of contaminated waste/soils, e.g. groundwater, used or expired chemicals, or construction materials
- Disturbance of contaminated soils
- Adverse effects on flora and fauna due to contamination of water or soils
- Water pollution due to sediment runoff from soil excavation and excess spoil storage
- Weed infestation from dispersion of seeds and so forth during clearing and access upgrading activities
- Odour impacts and increases in vermin from inappropriate general waste storage and disposal
- Consumption of non-renewable resources such as energy, diesel and other chemicals

- Greenhouse gas emissions due to consumption of energy from non-renewable resources.

The mismanagement of waste streams has the potential to result in the following impacts:

- Excessive waste being directed to landfill
- Various type of waste being generated and stored on site, with the potential for misclassification
- Water pollution
- Land contamination.

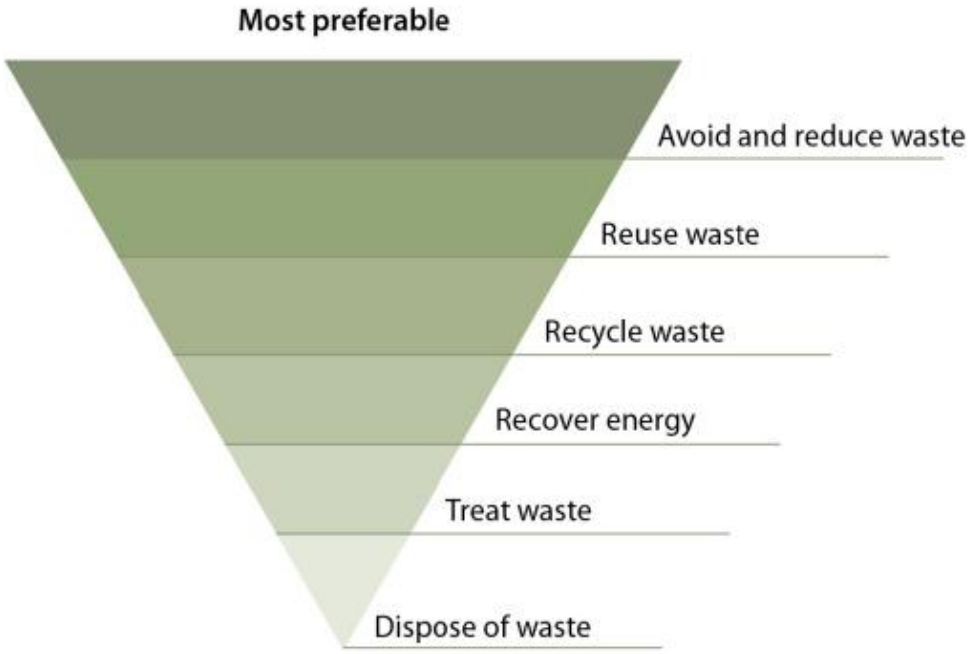
Waste classification will be required during construction to determine appropriate soil management and disposal, as detailed in Section 5.2 and Section 5.3.

A full list of management measures is included in Section 7 of this CWRMP. Refer to the Aspects and Impacts Register included in Appendix A2 of the OCEMP.

5 Waste management

5.1 Waste management hierarchy

The general approach to the hierarchy of waste management for the Project is in accordance with the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (EPA, 2014). The waste hierarchy provides guidance on the order of preference of approaches to achieve efficient resource use, as shown in Figure 5-1. The aspects of the hierarchy applicable to the construction of the Project are outlined below.



Source: NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA, 2014)

Figure 5-1: The waste hierarchy

5.1.1 Avoiding and reusing waste

Waste generation will be avoided and where avoidance is not reasonably practicable, waste generation will be reduced. This is because it preserves resources, avoids the use of additional resources to manage waste that would have been generated and aims to eliminate disposal costs. The goal is to maximise efficiency and avoid unnecessary consumption by:

- Selecting items with the least packaging or that require the least resources to produce
- Avoiding single-use materials or disposable goods
- Using products and materials that are recycled, recyclable, repairable, refillable, reusable or biodegradable.

Best endeavours will be used to target at least an average of 40% of recycled material used in road base and sub-base, whilst maintaining current quality and whole-of-life costs (Table 2-1).

5.1.2 Reuse and recycling

Where avoiding or reducing waste is not possible, waste will be reused, recycled, or recovered. Waste separation and segregation will be promoted on-site to facilitate reuse and recycling as a priority of the waste management program as follows:

- **Waste segregation on-site** – waste materials, including spoil and demolition waste, will be separated on-site into dedicated bins/areas for either reuse on-site or collection by a waste contractor and transported to off-site facilities
- **Water recovery** – in accordance with Section 5.9
- **Wood reuse** – woody debris and snags will be reused in a matter that enhances habitat for native fauna (refer to Section 6.4 of the CFFMP).

TfNSW Construction Contractors are required to propose recycled-content materials where they are cost and performance competitive and are at least the environmental equivalent of the non-recycled alternatives.

5.1.3 Waste handling and storage

Where waste is required to be handled and stored on-site prior to on-site reuse or off-site recycling/disposal, the following will occur:

- Spoil, topsoil and mulch will be stockpiled on-site in allocated areas, where appropriate, and mitigation measures for dust control and surface water management will be implemented as per the CSWMP (refer to Appendix B4 of the OCEMP)
- Liquid wastes will be stored in appropriate containers within bunded areas until transported off-site. Bunded areas will have the capacity to hold 110% of the liquid waste volume for bulk storage or 120% of the volume of the largest container for smaller packaged storage
- Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the *Environmentally Hazardous Chemicals Act 1985* and EPA waste disposal guidelines
- If asbestos or other hazardous materials are identified, they will be managed in accordance with the Asbestos Management Plan (AMP)(refer to Appendix D of the CCLMP)
- All other recyclable or non-recyclable wastes will be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations on-site and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities
- Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. These suitable areas will be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient area for stockpile storage.

5.1.4 Waste transportation

Waste being transported between site and/or a disposal facility will be covered. Uncovered loads of waste can spill onto the road that create litter or dust and can wash into waterways via stormwater drain.

Materials classified under the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) as hazardous during construction will be transported in accordance with the *Dangerous Goods (Road and Rail Transport) Act 2008 (NSW), Dangerous Goods (Road and Rail Transport)*

Regulation 2014 (NSW) and *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2008).

The transportation of asbestos waste will be completed in accordance with Asbestos Management Plan (AMP) (Appendix D of the CCLMP).

The NSW EPA guidelines will be followed for regulations when transporting hazardous and/or liquid wastes. An EPL and waste tracking are required to transport higher risk wastes and some liquid wastes (other than water or oil) that may be potentially hazardous or potentially harmful to human health or the environment.

Waste tyres and asbestos waste may be required to be tracked using the NSW EPA WasteLocate in accordance with clauses 76 and 79 of the *Protection of the Environment Operations (Waste) Regulation 2014*. WasteLocate will be used when:

- Consigning, transporting or accepting tyres with a total weight of more than 200 kilograms, or 20 or more tyres, in any single load
- Consigning, transporting or accepting more than 100 kilograms of asbestos waste, or more than 10 square metres of waste asbestos sheeting, in any single load.

For further detail on the transportation of asbestos waste, refer to the AMP.

5.1.5 Waste disposal

Where re-using, recycling or recovering waste is not possible, waste will be treated or disposed of at a waste management facility or premises lawfully permitted to accept the materials. Disposal of waste (and spoil) will be in accordance with the POEO Act and the WARR Act. The selection of waste disposal and recovery facilities will be dependent on the nature and volume of waste streams generated and the capacity of the receiving facilities at the time of the waste generation. Waste that is unable to be reused or recycled will be disposed of off-site to an appropriately licenced waste management facility following classification.

Where the Construction Contractor is to dispose of waste in an off-site location that is not a licensed waste facility (i.e. private property), the Construction Contractor will obtain a completed section 143 notice under the POEO Act for submission to the TfNSW ESM (or delegate). Waste in this context refers to spoil, virgin excavated natural material (VENM), excavated natural material (ENM), crushed rock, reclaimed asphalt pavement, mulch, waste concrete or any other construction waste material. The section 143 notice will include evidence that the waste site has the appropriate planning consent for receiving waste.

It is noted that the Contamination Assessment undertaken by GHD (2021) also provided preliminary waste classification for specific areas for contaminated waste within M12 Central. The Construction Contractor is to review this assessment to determine requirements for additional waste classification.

5.2 Classification of waste streams

Where waste cannot be avoided, reused, recovered or recycled it will be classified and disposed of appropriately. The classification of waste will be undertaken in accordance with the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) with appropriate records and disposal dockets retained for audit purposes in accordance with NSW CoA E103. The EPA guidelines identify six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid

(putrescible) and General Solid (non-putrescible) and describe a six-step process to classifying waste:

Step 1: Is it 'special waste'?

Establish if the waste should be classified as special waste. Special wastes include clinical and related waste, asbestos waste and waste tyres.

Note: Asbestos and clinical wastes must be managed in accordance with the requirements of Clauses 42 and 43 of the *Protection of the Environment Operations (Waste) Regulation 2005*.

Step 2: If not special, is it 'liquid waste'?

If it is established that the waste is not special waste it must be decided if it is 'liquid waste'. Liquid waste means any waste that: has an angle of repose of less than 5° above the horizontal, becomes free-flowing at or below 60°C or when it is transported, and is generally not capable of being picked up by a spade or shovel.

Liquid wastes are sub-classified into:

- Sewer and stormwater effluent
- Trackable liquid waste according to Protection of the Environment Operations (Waste) Regulation 2005 Schedule 1 Waste to which waste tracking requirements apply
- Non-trackable liquid waste.

Step 3: If not special or liquid, has the waste already been pre-classified by the NSW EPA?

The EPA has pre-classified several commonly generated wastes in the categories of hazardous, general solid waste (putrescibles) and general solid waste (non-putrescibles). If a waste is listed as 'pre-classified', no further assessment is required.

Step 4: If not pre-classified, is the waste hazardous?

If the waste is not special waste (other than asbestos waste), liquid waste or pre-classified, establish if it has certain hazardous characteristics and can therefore be classified as hazardous waste.

Hazardous waste includes items such as explosives, flammable solids, substances liable to spontaneous combustion, oxidizing agents, toxic substances and corrosive substances.

Step 5: If the waste does not have hazardous characteristics, undertake chemical assessment to determine classification

If the waste does not possess hazardous characteristics, it must be chemically assessed to determine whether it is hazardous, restricted solid or general solid waste (putrescible or non-putrescible). If the waste is not chemically assessed, it must be treated as hazardous.

Waste is assessed by comparing Specific Contaminant Concentrations of each chemical contaminant, and where required, the leachable concentration using the Toxicity Characteristics Leaching Procedure, against Contaminant Thresholds.

Step 6: Is the general solid waste putrescible or non-putrescible?

If the waste is chemically assessed as general solid waste, a further assessment is available to determine whether the waste is putrescible or non-putrescible. The assessment determines whether the waste is capable of significant biological transformation. If this assessment is not undertaken, the waste must be managed as general solid waste (putrescible).

5.3 Classification and management of potential waste streams

The construction activities and types of wastes which may be generated during the construction of the Project are outlined and classified in Table 5-1.

Table 5-1: Management of waste streams

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
Early works (including site establishment activities, installation of office accommodation, utilities, and other facilities and minor earthworks).	Surplus construction material including fencing, geofabrics sediment, concrete, steel, timber, and sand bags	General solid waste (non-putrescible)	Materials that are potentially recyclable would be disassembled and removed carefully to maximise reuse and recycling. To ensure diversion from landfill, materials would be clearly separated and stored temporarily on-site for reuse or removal to a recycling facility. Stockpiled materials would be monitored and managed in accordance with the OCEMP and Site Establishment Management Plan (SEMP). As a priority, surplus construction materials are to be stored by the Construction Contractor for reuse on the Project or be transferred to other sites for use in other TfNSW Projects. On-site assessment/treatment of surplus construction materials, such as visual assessment, screening/removal of oversized material, mixing and moisture conditioning, would facilitate the potential reuse of this material in the Project	Minimal Surplus construction material would be reused on-site or reused at alternate TfNSW Projects

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
			In the second instance, surplus construction materials may be recycled where possible. Sending surplus materials to landfill is to be avoided where possible.	
	Excavated materials including spoil	General solid waste (non-putrescible), restricted solid waste, hazardous waste and/or special waste	Excavation associated with establishment of ancillary facilities is to be minimised through selection of suitable ancillary facility locations that are as flat as possible. Excavated materials suitable for reuse are to be appropriately segregated and stored for future use on the Project. On-site assessment/treatment of these surplus construction materials, such as visual assessment, screening/removal of oversized material, mixing and moisture conditioning, would facilitate the potential reuse of this material as general fill or for landscaping. Earthworks waste is discussed further in the section below.	Minimal surplus excavated material is anticipated, as the Project would reuse excavated material where feasible * Note that quantities of contaminated spoil are specified together under earthworks below

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
Earthworks[2], drainage works and creek adjustment (including topsoil stripping, cut and fill preparation, and vegetation clearance)	Vegetation waste from the removal of trees, shrubs and ground cover	General solid waste (putrescible)	Where possible, vegetation clearing is to be minimised through Project design. Vegetation that is cleared would be mulched and reused where possible, including consideration of the Mulch Order and Mulch Exemption allowing for reuse on other TfNSW Projects. This may include the reuse of timber for fauna habitat and root balls in the rehabilitation of waterways. Remaining vegetation that is not reused is to be sent to an approved facility for sale or disposal. Weeds would be disposed of off-site at an appropriate licensed disposal facility (waste disposal locations are discussed in the following sections below under 'waste disposal locations'). On-site assessment/treatment of these surplus construction materials, such as visual assessment, screening/removal of oversized material, mixing and moisture conditioning, would facilitate the potential reuse of this material as general fill or for landscaping.	Minimal A majority of cleared vegetation is expected to be reused on-site or on other TfNSW Projects, other than weed species.

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
	Excavated spoil unsuitable for reuse (including contaminated spoil)	General solid waste (non-putrescible), restricted solid waste, hazardous waste, and/or special waste	Material that is identified as contaminated is to be segregated from uncontaminated material on-site to prevent cross-contamination and removed off-site to a licensed disposal facility. On-site assessment/treatment of surplus excavated materials, such as visual assessment, screening/removal of oversized material, mixing and moisture conditioning, would facilitate the potential reuse of this material as general fill or for landscaping. If asbestos or other hazardous materials are identified, they are to be disposed off-site to a licensed facility or managed in accordance with a Remedial Action Plan. Where reasonable and feasible, asbestos may be emplaced under the road pavement in accordance with a Remedial Action Plan. Waste disposal locations are discussed in the following sections under 'waste disposal locations'. The excavation, handling, storage, movement and disposal of waste material that is identified as being	Minimal excavated material is anticipated, as the Project would reuse excavated material where feasible. As an estimate, about 26,229 m^3 of contaminated material may need to be removed from site. In addition, areas of historical fill (totalling about 10,535 m^3) will be further investigated to determine if there is any contaminated material that would require excavation.

[2] These activities will not necessarily be carried out concurrently and will include low impact works such as investigations including archaeological and cultural salvage, minor vegetation clearing and minor excavation across the Project.

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
			contaminated would be carried out in accordance with the procedures detailed in this CWRMP in accordance with the *Work Health and Safety Regulation 2011 (NSW).*	
	Contaminated water (e.g. generated by a spill leading to contamination of surface water or encountering (already) contaminated groundwater)	Liquid waste	Erosion and sediment controls, appropriate bunding of all chemicals and use of water quality control measures would be implemented to minimise potential risk of surface water contamination. Contaminated water quantities are anticipated to be negligible or minor and are to be collected and disposed of by a suitably licensed contractor. Where contaminated water can be treated, it may be reused on-site for construction activities, including dust suppression, where possible.	Minimal
Demolition of existing structures on acquired/leased land and farm structures	Demolition materials including concrete, bricks, road base, tiles, timber (untreated and treated), metals, plasterboard, carpets, electrical and plumbing fittings and furnishing (doors, windows). May also include tyres, asbestos and lead paint.	General solid waste (non-putrescible), special waste and/or hazardous waste	Concrete and bricks are to be demolished using low impact techniques where practicable, so as to maintain the structure of the material, and thus its reusability. Materials are to be disassembled and removed carefully to maximise the potential for reuse and recycling. Where practical, removed road pavement is to be re-processed and	About 6,436 tonnes (This was calculated from house composition information provided in DECCW (2010f)

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
			used to provide sub-pavement layers for the Project or another TfNSW Project under a waste order or exemption where applicable. Where practical, concrete is to be recycled. Remaining material is to be disposed of at an offsite facility. Waste disposal locations are discussed in the following sections below under 'waste disposal locations'. Hazardous waste is to be removed by a qualified handler for recycling or recovery of energy where possible. If asbestos or other hazardous materials are identified, they are to be managed in accordance with a Remedial Action Plan or disposed of offsite at a licenced facility.	

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
Construction of pavements and bridges, retaining structures, including finishing works (e.g. line marking, installation of roadside furniture, landscaping and demobilisation and rehabilitation of construction facilities and disturbed areas)	General construction waste including timber formwork, scrap metal, steel, concrete, plasterboards, and packaging material (crates, pallets, cartons, plastics and wrapping material)	General solid waste (non-putrescible)	Materials that are potentially recyclable are to be disassembled and removed carefully to maximise further reuse and recycling. To ensure diversion from landfill, waste materials are to be clearly separated and temporality stored onsite for reuse or removal to a recycling facility. Stockpiled materials would be monitored and managed in accordance with the OCEMP and SEMP. Where possible, the amount of packaging waste is to be minimised by avoiding the ordering of unnecessary or excess supplies and by buying in bulk. Where reasonable and feasible, cost-effective suppliers that use sustainable, recycled and/or recyclable material are to be used. Packaging waste generated is to be sorted for recycling or disposal at an approved facility. In the event of excess supplies due to accidental over-ordering or design changes, excess material would be reused, returned to the supplier or recycled where feasible. Remaining material would be disposed of at a licenced facility.	Minimal

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
	Surplus construction material including fencing, sediment, gravel/crushed rock, asphalt, concrete, steel, aggregate, formwork, asphalt, landscaping material and sand bags.	General solid waste (non-putrescible)	Materials that are potentially recyclable would be disassembled and removed carefully to maximise further reuse and recycling. To ensure diversion from landfill, waste materials would be clearly separated and stored temporarily on-site for reuse or removal to a recycling facility. Stockpiled materials would be monitored and managed in accordance with the OCEMP and SEMP. As a priority, surplus construction materials may be transferred to other sites for use or stored by the Construction Contractor for future use. In the second instance, surplus construction materials may be recycled where possible. Surplus materials would be diverted from, landfill where possible. On-site assessment/treatment of surplus construction materials, such as visual assessment, screening/removal of oversized material, mixing and moisture conditioning, would facilitate the potential reuse of this material in the Project In the second instance, surplus construction materials may be recycled where possible. Sending	Minimal Surplus construction material would be reused on-site or reused at an alternate TfNSW Project where possible

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
			surplus materials to landfill is to be avoided where possible.	
Temporary works including the construction of work platforms, hardstand areas, and sediment basins	General construction waste including timber formwork, scrap metal, steel, concrete, plasterboards and packaging material (crates, pallets, cartons, plastics and wrapping material)	General solid waste (non-putrescible)	To ensure diversion from landfill, waste materials would be clearly separated and stored onsite, monitored and managed in accordance with this CWRMP. Where possible, the amount of packaging waste would be minimised by avoiding the ordering of unnecessary or excess supplies and by buying in bulk. Where reasonable and feasible, cost-effective suppliers that use sustainable, recycled and/or recyclable material would be used. Packaging waste generated would be sorted for recycling or disposal at an approved facility. In the event of excess supplies due to accidental over-ordering or design changes, excess material would be reused, returned to the supplier or recycled where feasible. Materials that are potentially recyclable would be disassembled and removed carefully to maximise further reuse and recycling.	Minimal
	Sediment and sludge within sediment basins	General solid waste (non-putrescible)	Sediment removed from basins would be dewatered and may be reused on-site (e.g. in landscaping	Minimal

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
			works) or in non-structural fill embankments. If the material cannot be reused on-site, it would be disposed of at an appropriately licensed facility.	Any sediment/ sludge is expected to be treated and reused on-site
Activities at site offices	General waste from site office including putrescibles, paper, cardboard, e-waste plastics, glass, site litter, cigarette butts, printer cartridges and sewage waste	General solid waste (non-putrescible)	Waste and recycling generated by the site offices would be source-separated into dedicated bins, such as: • General waste • Co-mingled recycling • Paper/cardboard • Toner/cartridges • E-waste • Food waste (where practicable). The segregation of recyclables from the general waste stream would maximise resource recovery and minimise materials sent to landfill. Bins will be clearly labelled and coloured to reflect the correct stream. Staff will be trained about the internal office waste management system to ensure adequate understanding across all employees. Sewage will be directed to the sewage mains or pumped out for disposal at an appropriately licensed facility.	Minimal Volumes of waste produced will be dependent on the number of workers onsite at any one time

Construction Activity	Waste Type	Waste Classification	Reuse options and waste management approach	Potential waste quantity requiring removal offsite
Operation of plant and equipment	Waste from operation and maintenance of construction vehicles and machinery including adhesives, lubricants, waste fuels, cleaning products and chemicals, and oils, engine coolant, batteries, hoses and tyres	Hazardous waste, special waste, liquid waste	Liquid waste will be collected and transferred to a dedicated recycling facility where possible, to ensure diversion from landfill. Batteries will be collected and recycled by a qualified handler.	Minimal
	Clean up waste in the event of an accidental spill of fuel or chemicals	Hazardous waste, Liquid waste	Materials collected during clean-up will be disposed of at an appropriately licensed facility	Minimal Any waste from spills will be dependent on the size and nature of the spill

5.4 Waste Management Register

Details of waste types, volumes and destinations will be recorded in the Waste Management Register in accordance with NSW CoA E104. A template waste management register is included in Appendix B. The Waste Management Register will detail the following:

- The quantity of each type of waste generated including its classification and source location (recorded using latitude and longitude coordinates)
- The destination location/s for all wastes generated during construction
- The quantities of any waste types imported onto any Project site, including their classification and emplacement location (recorded using latitude and longitude coordinates)
- The quantities and types of wastes that are subject to a Resource Recovery Order and/or Exemption
- Disposal records demonstrating that receiving facilities have lawfully accepted the waste type.

The Construction Contractor will collect and keep legible copies of all receipts and/or weighbridge dockets from transporters and/or contractors in relation to disposal of waste from the premises.

The Waste Management Register will be made available to the Planning Secretary and EPA on request.

5.5 Waste exemption

Clause 51 of the *Protection of the Environment Operations (Waste) Regulation 2005* enables the EPA to grant exemptions to the licensing and payment of levies for the land application or use of waste from some of the requirements under the *Protection of the Environment Operations Act* 1997 and Regulation for certain wastes and resource recovery activities where it can be demonstrated that waste reuse would not cause harm to human or environmental health. Under these provisions, the NSW EPA requires two separate applications, either or both of which may be applicable to the Project:

- A Resource Recovery Order made under Clause 93 of the Regulation, which covers the requirements for the generation and/or processing of material for reuse
- A Resource Recovery Exemption made under clauses 91 and 92 of the Regulation, which relates to the consumption of any material for reuse.

The general Resource Recovery Exemptions and Orders that the EPA has issued for a range of commonly recovered, high volume and well characterised waste materials that allow their use as fill or fertiliser at unlicensed, off-site facilities. The general Resource Recovery Exemptions and Orders that may be applicable to the Project are defined in Table 5-2 below and at EPA Current Orders and Exemptions. These are general gazette exemptions that do not require approval. A specific exemption may be granted where an application is made to the EPA.

Table 5-2: Waste Recovery Exemptions and Orders, and associated conditions relevant to the Project

Exemption/Order	General Conditions
Compost Exemption 2016	The chemical concentration or other attributes of compost listed in the Compost Exemption must not be exceeded The compost can only be applied to land as a soil amendment The consumer must ensure that they do not cause or permit the migration of leachate from the site The consumer must ensure that any application of compost to land occurs within a reasonable period of time.
Effluent Exemption 2014	The effluent can only be applied to land for the purposes of irrigation or as a soil amendment material. The consumer must apply the effluent within a reasonable period of time.
Pasteurised Garden Organics Exemption 2016	The chemical concentration or other attributes of the Pasteurised Garden Organics (PGO) listed in the Pasteurised Garden Organics Exemption must not be exceeded The PGO can only be applied to land as a soil amendment The consumer must ensure that they do not cause or permit the migration of leachate from the land application site The consumer must ensure that any application of pasteurised garden organics to land occurs within a reasonable period of time.
The Excavated Natural Material Exemption 2014	The chemical concentration or other attributes of the excavated natural material listed in the Excavated Natural Material Exemption must not be exceeded. The excavated natural material can only be applied to land as engineering fill or used in earthworks. ENM handling, processing and testing requirements are outlined in detail in the exemption.
The Excavated Public Road Material Exemption 2014	The excavated public road material can only be stored within the road corridor at the site where it is to be applied to land. The excavated public road material can only be applied to land within the road corridor for public road related activities including road construction, maintenance and installation of road infrastructure facilities. This exemption does not apply to the land application of excavated public road material on any land outside the road corridor. The excavated public road material cannot be applied on private land. The consumer must land apply the relevant waste within a reasonable period of time.
The Mulch Exemption 2016	The raw mulch can only be applied to land for the purposes of filtration or as a soil amendment material or used either singularly or in any combination as input material(s) to a composting process. The consumer must land apply the raw mulch within a reasonable period of time.

Exemption/Order	General Conditions
The Recovered Aggregate Exemption 2014	The chemical concentration or other attribute of the recovered aggregate listed in the Recovered Aggregate Exemption must be met. The recovered aggregate can only be applied to land for road making activities, building, landscaping and construction works. This approval does not apply to any of the following applications: • Construction of dams or related water storage infrastructure • Mine site rehabilitation • Quarry rehabilitation • Sand dredge pond rehabilitation • Back-filling of quarry voids • Raising or reshaping of land used for agricultural purposes and • Construction of roads on private land unless: ◦ the relevant waste is applied to land to the minimum extent necessary for the construction of a road and ◦ a development consent for the development has been granted under the relevant Environmental Planning Instrument (EPI) or ◦ it is to provide access (temporary or permanent) to a development approved by a Council or • The works undertaken are either exempt or complying development.
The Blast Furnace Slag Exemption 2014	Blast furnace slag or blended slag can only be applied to land in cementitious mixes such as concrete or in non-cementitious mixes such as an engineering fill in earthworks or roadmaking activities.
The Reclaimed Asphalt Pavement Exemption 2014	Reclaimed asphalt can only be applied to land for road related activities including road construction or road maintenance
Treated Drilling Mud Exemption 2011	At the time the treated drilling mud is received at the premises, the material must meet all chemical and other material requirements for treated drilling mud which are required on or before the supply of treated drilling mud under 'the treated drilling mud order 2014'. The treated drilling mud can only be applied to land as engineering fill or for use in earthworks. The consumer must keep a written record of the following for a period of six years: • the quantity of any treated drilling mud received; and • the name and address of the supplier of the treated drilling mud received. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request. The consumer must ensure that any application of treated drilling mud to land must occur within a reasonable period of time after its receipt.
Stormwater Exemption 2014	The stormwater can only be applied to land within the definitions of "application to land". The consumer must ensure that any application of stormwater to land must occur within a reasonable period of time after its receipt.

5.6 Management of surplus material approval

Earthworks will be required for construction activities, including road construction, bridge construction and drainage. To ensure the amount of waste is minimised, earthwork requirements will be managed across the entire Project, with construction staging taking into account efficient resource use and opportunities for reusing materials to limit waste generation.

Surplus material excavated from the Project may consist of VENM (being natural rock, soil, sand and clay), excavated natural material (at least 98% natural soil or rock material) or excavated public road materials (typically asphalt or concrete pavement materials). The preferred approach to managing surplus material is to re-use or recycle the material as fill on-site (with the exception of contaminated material) and within the Project boundary. TfNSW will also investigate whether unused resources could be used on other TfNSW Projects.

Unsuitable material is surplus material that cannot be used beneficially elsewhere on-site. Off-site disposal of unsuitable material will be required. Surplus spoil that is unable to be reused on-site will be transported for beneficial reuse off-site in accordance with a relevant EPA resource recovery exemption or disposed of at a licensed waste facility.

Before any surplus material is disposed off-site, it will be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) and the POEO Act.

Measures to avoid the risk of importation of pathogens or weeds into Project construction areas are included in the Section 6.6 of the CFFMP (refer to Appendix B2 of the OCEMP).

Waste generated outside the site will not be received for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the POEO Act, if such a licence is required in relation to that waste.

The Construction Contractor will prepare and implement stage-specific Spoil Management Plans (SMPs) before commencement of construction of the Project to identify spoil disposal site(s) and the management of spoil on-site and during off-site transport. The SMPs will be prepared in accordance with relevant EPA guidelines, TfNSW Specifications and the overarching SMP provided in Appendix C of this CWRMP. The purpose of the SMP is to:

- Identify the environmental management issues associated with the sourcing, handling, transportation, stockpiling, disposal and reuse of spoil material
- Document and describe the systems and procedures developed to mitigate environmental impacts
- Provide practical measures that will be implemented during construction of the Project to minimise adverse impacts on the surrounding environment resulting from spoil management

The Construction Contractor's SMPs will be reviewed by TfNSW for consistency with the requirements of this overarching CWRMP and appended to the Construction Contractor's CWRMPs.

5.7 Management of cleared vegetation waste

Vegetation cleared from the Project area to facilitate construction works will be collected and reused on- and off-site wherever possible. Cleared tree hollows, dead wood, dead trees, fallen logs and cleared tree trunks which provide fauna microhabitats if agreed by the TfNSW ESM (or delegate) and in consultation with local landowners and stakeholders, may be relocated under the supervision and direction of an Ecologist within the Project footprint for use in conjunction with soil

erosion and sediment control measures. Native tree materials may also be reused on-site as fencing material or for other suitable purposes. A Vegetation Clearing Procedure that outlines the re-use of cleared vegetation will be prepared as part of the CCFMP (refer to Appendix B2 of the OCEMP).

Non-reusable vegetation, such as exotic plant species and priority weeds will be disposed off-site, at a licensed landfill facility. Disposal of priority weeds will be carried out in accordance with their category under the *Biosecurity Act 2015* and following Department of Primary Industry guidelines.

The Construction Contractor will prepare a Clearing and Grubbing EWMS to detail the procedures for the disposal of priority weeds and exotic plants and for the recycling and disposal of all other materials from clearing and grubbing operations during construction of the Project (refer to Section 3.3.4 and Appendix B2 of the OCEMP). The Construction Contractor will prepare a Clearing and Grubbing EWMS before undertaking any clearing activities.

If reuse of cleared native trees and vegetation cannot be reused, the Construction Contractor will consult with relevant councils, Western Sydney Parklands Trust and Landcare groups and relevant government agencies, to determine if others in habitat enhancement, beneficial re-use and rehabilitation work could use the cleared vegetation instead of other disposal options.

5.8 Mulch

Native trees removed during clearing and grubbing that are not reused in conjunction with soil erosion and sediment control measures or other identified purposes will be converted to mulch and stockpiled for use during landscape planting. Native vegetation used for mulch in the landscaping works will take priority over the use of native vegetation in soil erosion and sediment control measures.

Excess mulch will be disposed off-site for beneficial reuse where practical. Any mulch material applied or stockpiled on land must fulfil the requirements of the Mulch Exemption and the Mulch Order as if the mulch were being applied to an environmentally sensitive area.

Preventative actions to control the potential spread of weeds will be implemented in accordance with the CFFMP (refer to Appendix B2 of the OCEMP).

5.9 Water

Construction activities may require the use of water, both non-potable and potable, include dust suppression, compaction of fill, pavement works, road finishing works, landscaping and use of office amenities.

Where available and practicable, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources (e.g., treated water from sediment basins, harvested rainwater) will be used in preference to potable water. The Project target is to source 33% of water from non-potable sources.

A Construction Water Reuse Strategy in accordance with REMM SWH03 will be prepared by the Construction Contractor. This strategy will detail considerations of the current and future demand of potable water within the Project corridor and consider possible alternate water sources to be used for the Project, where potable water may not be required.

5.10 Management of asbestos

Demolition activities for construction of the Project may require disposal of asbestos pipes, conduits and pits. The EIS (Chapter 8.1) also identified Areas of Environmental Interest (AEIs) in 2017 that may potentially contain asbestos, including historical structures, fill sites and illegally dumped stockpiles.

EWMS will be prepared to document the procedure for disposal of asbestos pipes, conduits, pits, structures, fill and stockpiles in the AMP. The AMP will also outline requirements for the encapsulation of asbestos to be carried out in accordance with Project Remedial Action Plans. The AMP is found in Appendix C of the CCLMP (refer to Appendix B8 of the OCEMP). Removal of asbestos materials will be carried out by a licensed asbestos removalist (where required) holding a current licence issued by SafeWork NSW. Removal of asbestos materials must comply with the *Work, Health and Safety Act 2019* and the SafeWork Australia code of practice for 'How to Safely Remove Asbestos'. Off-site disposal of the asbestos material will be at facilities legally authorised to accept such material.

5.11 Coal tar management

Coal tar may be present in the existing pavement and around utilities to be removed or cold milled during construction of the Project. Coal tar is classified within the Australian Hazardous Substances regulatory regime as a Category 1 Carcinogen.

If coal tar is identified within the Project area, construction activities will cease, and the Construction Contractor will notify the TfNSW ESM (or delegate). If required, testing of the material will be undertaken in accordance with TfNSW Test Method T542.

Should coal tar be encountered during construction of the Project, the Construction Contractor will prepare stage-specific Coal Tar Management Plan in accordance with the requirements of *Technical Direction: Coal tar asphalt handling and disposal* (TfNSW, 2015) and TfNSW Specifications. The purpose of the Coal Tar Management Plan is to:

- Identify the environmental management issues associated with the handling, transportation, and disposal of coal tar
- Document methods for the investigation, sampling and testing of materials potentially containing coal tar, including records of surveyed locations
- Provide practical measures that will be implemented during construction of the Project to minimise adverse impacts on the surrounding environment and human health resulting from coal tar management.

The Construction Contractor's Coal Tar Management Plan will include, but not be limited to:

- Outline of potential sources of coal tar
- Procedure for the identification of coal tar
- Process for the testing and classification of coal tar
- Measures for the safe handling of coal tar
- Locations of off-site disposal facilities
- Process for safe transportation of coal tar
- Performance criteria

- Potential impacts associated with spoil
- Management measures and mitigation strategies relevant to spoil
- Monitoring and reporting
- Process for corrective action.

The Construction Contractor's Coal Tar Management Plan will be reviewed by TfNSW for consistency with the requirements of this overarching CWRMP, the CoA and the REMMs and will be appended to the Construction Contractor's CWRMPs.

5.12 Illegal dumping management

Illegally dumped waste is defined as the disposal of waste larger than litter on land or in water without the correct approvals (an EPL or planning approval). The Construction Contractor will actively inform NSW EPA and/or the local regional illegal dumping squad (RID Squad) of any potential fly-tipping and/or illegally dumping identified during construction.

6 Resource management strategy

6.1 Resource management

Construction Contractors are required to manage resources and identify reuse options for surplus materials during construction of the Project.

Waste and resource management strategies for the Construction Contractor to consider include:

- Waste generation will be avoided
- Where avoidance is not reasonably practicable, waste generation will be reduced.
- Where avoiding or reducing waste is not possible, waste will be reused, recycled, or recovered. Surplus construction material could be reused on-site or reused at alternate TfNSW projects
- Vegetation cleared (excluding exotic plant species and priority weeds) from the Project area will be collected and reused on site wherever possible, for example as habitat for fauna under the supervision and direction of an Ecologist
- Native tree materials may also be reused on-site as fencing material or for other suitable purposes (e.g. soil erosion and sediment control measures) or will be converted to mulch to use during landscape planting
- Excess mulch not used for landscaping will be disposed off-site for beneficial reuse where practical, and where the requirements of the Mulch Exemption and the Mulch Order are fulfilled
- Waste will be handled and appropriately stored on-site before on-site reuse
- Where available and practicable, stormwater, recycled water or other water sources (e.g., treated water from sediment basins, harvested rainwater) will be used in preference to potable water
- Wherever feasible and reasonable, construction material will be sourced from within the Sydney region
- Waste that cannot be reused on-site, but can be recycled or recovered, will be removed off-site for recycling or recovering at a licenced facility
- As a final approach, waste that cannot be reused, recycled, or recovered, will be removed off-site for disposal at a licenced facility.

The following sections provide detail on energy conservation and greenhouse gas emissions.

6.2 Energy conservation

TfNSW and its Construction Contractors are dedicated to implementing energy conservation best practice and the reduction of GHG by adopting energy efficient work practices including:

- Developing and implementing procedures to minimise energy use, including:
  - Using LED and low energy equipment for signals and signage
  - Investigating options for using renewable energy sources to power electronic equipment
- Conducting awareness programs for all site personnel regarding energy conservation methods
- Regular maintenance of construction plant and equipment to maximise fuel efficiency.

The Construction Contractor will monitor and report on energy use during construction of the Project. The Construction Contractor will implement an appropriate energy use monitoring tool, such as the TfNSW Carbon Estimation Reporting Tool. The Construction Contractor will also prepare Quarterly Project Sustainability Reports during construction outlining actual performance against the nominated sustainability targets, the work that has been undertaken and the achievements that have been met, as well as identifying those areas where improvements were made (refer to the Sustainability Strategy).

6.3 Greenhouse gas emissions

Opportunities to reduce GHG emissions during construction exist through investigating alternative, lower embodied carbon options for construction including:

- Specifying lower embodied energy concrete, for example concrete that contains less Portland cement (which would be replaced with fly-ash) for lower strength concrete applications
- Specifying recycled steel which has about half the embodied emissions of virgin steel
- Using modern diesel engine equipment, to ensure highest fuel efficiency ratings
- Using biofuels (e.g. biodiesel, ethanol, or blends such as E10 or B80) which can considerably reduce the GHG emissions for construction equipment
- Reporting on and aiming to achieve compliance with air emissions standards for mobile non-road diesel plant and equipment as per the NSW Government Resource Efficiency Policy
- Reviewing cut and fill balances for earthworks to minimise transportation distances for materials
- Reviewing local options for import and export of fill materials to reduce transportation distances
- Preparing a construction workforce travel plan to reduce travel emissions
- Limiting vegetation clearance where feasible and revegetating with native species
- Taking a whole of life costing approach to identify and implement a range of opportunities with a financial payback of four years or less
- Use of on-site renewables i.e. solar
- Purchasing of green power
- Procuring of locally manufactures goods/ materials.

The Construction Contractors would identify those opportunities that are reasonable and feasible to reduce the Projects GHG emissions to meet the sustainability targets outlined in the Sustainability Strategy.

6.4 Procurement

In accordance with REMM W01, the Construction Contractor will develop a stage specific Procurement Strategy. The strategy will include details on the minimisation of unnecessary consumption of materials and waste generation in accordance with relevant legislation and guidelines. This will include sustainable procurement of materials. The procurement of goods and services will consider goods and services that:

- Are from local suppliers
- Make use of recycled materials or materials with a low embodied energy content.
- Are energy efficient or have low embodied energy
- Minimise the generation of waste.

7 Environmental control measures

A range of environmental requirements and management measures are identified in the Environmental Assessment Documentation, and relevant TfNSW documents. Specific measures and requirements to address waste impacts are outlined in Table 7-1.

Table 7-1: Waste, energy, and water management and mitigation measures

ID	Management Measure	When to implement	Responsibility for implementation	M12 West	M12 Central	M12 East	Reference or source	Evidence of implementation
Waste Management								
WR1	The waste minimisation hierarchy principles of avoid/reduce/reuse/ recycle/dispose will be used.	Prior to construction, during construction and operation	Construction Contractor ESR	✓	✓	✓	NSW CoA E100	Construction documentation
WR2	A Waste Management Register will be developed prior to any waste generation.	Prior to construction	Construction Contractor ESR	✓	✓	✓	NSW CoA E104 TfNSW Specifications	Appendix B Waste Management Register
WR3	All wastes, including contaminated wastes, will be identified and classified in accordance with the EPA's *Waste Classification Guidelines: Part 1 Classifying Waste*, with appropriate records and disposal dockets retained for audit purposes. Disposal of contaminated waste will be completed in accordance with the POEO Act, *Protection of the Environment Operations (Waste) Regulation 2014*. The Construction Contractor will review the investigation assessment undertaken by GHD (2021) for M12 Central to determine requirements for additional waste classification.	During construction	Construction Contractor Manager ESR	✓	✓	✓	NSW CoA E101 to E103 REMM SC03 and SC08	Waste Classification Reports Disposal dockets

ID	Management Measure	When to implement	Responsibility for implementation	M12 West	M12 Central	M12 East	Reference or source	Evidence of implementation
WR4	Wherever feasible and reasonable, construction material will be sourced from within the Sydney region.	During construction	Construction Contractor ESR	✓	✓	✓	REMM W03	Procurement Strategy
WR5	Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas will be required to be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient area for stockpile storage.	During construction	Construction Contractor ESR Construction Contractor Superintendent	✓	✓	✓	REMM W04	Construction documentation
WR6	The Spoil Management Plan will be implemented for the Project as part of the CWRMP and CSWMP.	During construction	Construction Contractor ESR	✓	✓	✓	REMM W02	Spoil Management Plan Appendix C
WR7	An annual Waste Avoidance and Resource Recovery Report will be prepared and submitted to TfNSW.	During construction	Construction Contractor ESR	✓	✓	✓	TfNSW Specifications	Annual Waste Avoidance and Resource Recovery Report
WR8	Comply with s143 of the POEO Act when transporting and/or depositing of waste.	During construction	Construction Contractor ESR	✓	✓	✓	TfNSW Specifications	s143 Form
WR9	The importation of waste and the storage, treatment, processing, reprocessing or disposal of such waste will comply with the	During construction	Construction Contractor ESR	✓	✓	✓	NSW CoA E101	Site inspection records

ID	Management Measure	When to implement	Responsibility for implementation	M12 West	M12 Central	M12 East	Reference or source	Evidence of implementation
	conditions of the current EPL for the Project, or be done in accordance with a Resource Recovery Exemption or Order issued under the *Protection of the Environment Operations (Waste) Regulation 2014.*		Construction Contractor Superintendent					
WR10	Waste will only be exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a Resource Recovery Exemption or Order issued under the *Protection of the Environment Operations (Waste) Regulation 2014,* or to any other place that can lawfully accept such waste.	During construction	Construction Contractor ESR Construction Contractor Project/Site Engineer Construction Contractor Foreman/Site Supervisor	✓	✓	✓	NSW CoA E102	s143 Form Disposal dockets
GHG emissions								
GHG 1	Implement the Vegetation Clearing Procedure (Appendix C of the CFFMP) to minimise vegetation removal	During construction	Construction Contractor ESR Construction Contractor Construction Manager	✓	✓	✓	REMM GG03	Site inspection records
GHG 2	The procurement of goods and services will consider goods and services that: • Are from local suppliers	During construction	Construction Contractor ESR Construction Contractor Project Manager	✓	✓	✓	REMM GG04	Procurement Strategy

ID	Management Measure	When to implement	Responsibility for implementation	M12 West	M12 Central	M12 East	Reference or source	Evidence of implementation
	• Make use of recycled materials or materials with a low embodied energy content. • Are energy efficient or have low embodied energy • Minimise the generation of waste.		Construction Contractor Construction Manager					
GHG 3	Construction plant and equipment will be well maintained to maximise fuel efficiency.	During construction	Construction Contractor Superintendent Construction Contractor Foreman/Site Supervisor	✓	✓	✓	REMM GG05	Plant inspection records

8 Compliance management

8.1 Roles and responsibilities

The Project organisational structure and overall roles and environmental responsibilities are outlined in Section 5.1 of the OCEMP. Specific responsibilities for the implementation of construction waste and energy management measures are detailed in Section 7 of this CWRMP.

8.2 Training

To ensure that this Plan is effectively implemented, all site personnel (including Construction Contractors) will undergo site induction training relating to waste and energy management issues before construction commencing. The induction training will address elements related to waste and energy management, including:

- Existence and requirements of this overarching CWRMP, the Construction Contractor's CWRMP and all plans and procedures prepared under the CWRMPs
- Relevant legislation and regulations
- Incident response, management and reporting
- Waste reporting requirements
- Waste minimisation principles
- Requirements of the waste hierarchy
- Waste/recycle storage requirements
- Best practice energy efficiency
- Equipment start up and shut down procedures
- Location of refuse and recycling bins
- Other specific responsibilities for waste and reuse management
- Other specific responsibilities for energy management.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in waste and energy management or those undertaking an activity with a high risk of environmental impact. Site personnel will undergo refresher training at not less than six monthly intervals.

The ER will review and approve the induction and training program before the commencement of construction and will monitor implementation.

Daily pre-start meetings conducted by the Construction Contractor's Foreman/ Site Supervisor will inform the site workforce of any environmental issues relevant to waste and energy that could potentially be impacted by, or impact on, the day's activities.

Further details regarding staff induction and training are provided in Section 5.3 of the OCEMP.

8.3 Inspections and monitoring

The Construction Contractor will carry out regular monitoring and inspections of activities with the potential to generate waste for the duration of construction of the Project. Table 8-1 outlines the monitoring and inspection activities that will be undertaken during construction by TfNSW, Construction Contractor and waste contractor.

Weekly and other routine inspections by the TfNSW ESM, Environmental Review Group (ERG) representatives and ER will occur throughout construction. Detail on the nature and frequency of these inspections are documented in Section 7.1 and Section 7.2 of the OCEMP.

Table 8-1: Program for waste and energy monitoring and inspections

Item	Frequency
TfNSW	
Review waste and energy requirements during inspections	As required during inspections
Review recorded results of any soil, surface or groundwater sampling	As required
Review records of waste contractors and landfill facilities used to ensure waste management can be traced from cradle to grave	Review monthly
Review licences and permits for handling, transporting and disposal of wastes in accordance with TfNSW Specifications	For disposal of waste off-site
Review collated waste disposal data and maintain the Project waste register	Review monthly
Construction Contractor	
Undertake waste and energy inspections and record on the environment checklist, including inspections for litter, unauthorised disposal of construction waste, contamination of waste streams and adequacy of capacity of waste receptacles	Weekly
Maintain and document the types and volumes of wastes generated, re-used, recycled and disposed of	Daily/as required
Document the locations of stockpiled and stored waste	Daily/as required
Develop a Waste Management Register prior to any waste collected for disposal and/or recycling until final completion in accordance with the TfNSW G36 Specification	Prior to any work and then monthly
Verify licences and permits for handling, transporting and disposal of wastes in accordance with TfNSW Specifications	For disposal of waste off-site

Item	Frequency
Keep records of waste contractors and landfill facilities used to ensure waste management can be traced from cradle to grave	Monthly
Carry out waste management and energy use audits to assess extent of waste hierarchy and identify/address energy wastage and to assess compliance with waste targets / performance criteria	Six-monthly
Record results of any soil, surface or groundwater sampling	As required
Maintain and record resource usage during construction work (e.g. energy, water, fuel, oil, etc)	Monthly
Waste contractor	
Maintain and document the types and volumes of wastes collected recycled and disposed of. Provide monthly reports on waste removal and disposal activities.	When waste is collected and report on a monthly basis

Requirements and responsibilities in relation to monitoring and inspections, additional to those identified in Table 7-1 and Table 8-1 are documented in Sections 7.1 and 7.2 of the OCEMP.

8.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of waste and energy management measures, and compliance with this Plan, CoA and REMMs, and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 7.4 of the OCEMP.

8.5 Non-conformances

A non-conformance is the failure or refusal to comply with the requirements of Project system documentation, including this CWRMP. Any member of the Construction Contractor's Project team may raise a non-conformance or improvement opportunity.

When a non-conformance is detected, the process described in Section 7.3 of the OCEMP will be implemented. The Construction Contractor's Quality Plan will describe the process for managing non-conforming work practices and initiating corrective/preventative actions or system improvements in accordance with the process outlined in Section 7.3.5 of the OCEMP.

8.6 Reporting and identified records

Reporting requirements and responsibilities are documented in Section 7.5 of the OCEMP.

The Construction Contractor will maintain accurate records substantiating all construction activities associated with the Project or relevant to the conditions of approval, including measures taken to implement this CWRMP. Records must be made available to the DPHI and NSW DCCEEW and

the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) upon request, within the timeframe nominated in the request.

The Construction Contractor will collect and keep legible copies of all receipts and/or weighbridge dockets from transporters and/or contractors in relation to disposal of waste from the premises.

Waste contractors will report regularly on their waste management practices. The Construction Contractor will relay the required information through regular reporting to TfNSW and other stakeholders as required. Waste and energy use records will feed into the sustainability reporting under the Sustainability Strategy. Refer to the Sustainability Strategy for further detail.

Table 8-2 outlines the reporting requirements for TfNSW, Construction Contractors and waste contractors.

Table 8-2: Waste reporting requirements

Item	Frequency
TfNSW	
Report power consumption (green power and other) in the monthly report	Monthly
National Greenhouse and Energy Reporting of waste and energy will be undertaken in accordance with legislative requirements under the NGER Act	Monthly
Construction Contractor	
Monthly waste register provided to TfNSW (prepared in accordance with the template in Annexure B or Construction Contractor's approved alternative register)	Monthly
Records of resource usage during construction work (e.g. energy, water, fuel, oil, etc.) in the Quarterly Project Sustainability Report provided to TfNSW (refer also to the Sustainability Strategy)	Quarterly
Records of energy use and emissions in the Quarterly Project Sustainability Report provided to TfNSW (refer also to the Sustainability Strategy)	Quarterly
Records of waste management, take-back, and recycling in the Quarterly Project Sustainability Report provided to TfNSW (refer also to the Sustainability Strategy)	Quarterly
Waste Avoidance and Resource Recovery Report in accordance with TfNSW WA Specification G36/F provided to TfNSW	Annually
Waste contractor	
Service provider waste reports provided to the Construction Contractor	Monthly

9 Review and improvement

9.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Identify environmental risks not already included in the risk register
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

The Construction Contractor will be responsible for ensuring Project environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the Project as part of the continuous improvement process. The process for ongoing risk identification and management during construction is outlined in Section 4.1 of the OCEMP.

9.2 CWRMP update and amendment

The processes described in Section 7.7 of the OCEMP may result in the need to update or revise this CWRMP. This will occur as needed.

Any revisions to this CWRMP and other Sub-plans will be in accordance with the process outlined in Sections 1.1.2 and 7.6 of the OCEMP.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure.

Appendix A – Secondary CoA and REMMs

Appendix B9

Construction Waste and Resources Management Sub-plan

Appendix A – Secondary CoA and REMMs

M12 Motorway

May 2024

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CoA

CoA No.	Condition Requirements	Applicability			CWRMP Reference
		M12 West	M12 Central	M12 East	
E15	Prior to vegetation clearing, the Proponent must identify where it is practicable for the CSSI to reuse native trees and vegetation that are to be removed. If it is not possible for the CSSI to reuse all removed native trees and vegetation, the Proponent must consult with the relevant council(s), Western Sydney Parklands Trust and Landcare groups and relevant government agencies to determine if:	✓	✓	✓	Section 5.7 CFFMP
	(a) Hollows, tree trunks, mulch, bush rock and root balls salvaged from native vegetation impacted by the CSSI; and	✓	✓	✓	
	(b) Collected plant material, seeds and/or propagated plants from native vegetation impacted by the CSSI, could be used by others in habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options.	✓	✓	✓	
E100	Waste generated during Work and operation must be dealt with in accordance with the following priorities: (a) Waste generation must be avoided and where avoidance is not reasonably practicable, waste generation must be reduced;	✓	✓	✓	Section 5.1
	(b) Where avoiding or reducing waste is not possible, waste must be re-used, recycled, or recovered; and	✓	✓	✓	
	(c) Where re-using, recycling or recovering waste is not possible, waste must be treated or disposed of.	✓	✓	✓	
E101	The importation of waste and the storage, treatment, processing, reprocessing or disposal of such waste must comply with the conditions of the current EPL for the CSSI, or be done in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014, as the case may be.	✓	✓	✓	Section 5.5

CoA No.	Condition Requirements	Applicability			CWRMP Reference
		M12 West	M12 Central	M12 East	
E102	Waste must only be exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a Resource Recovery Exemption or Order issued under the *Protection of the Environment Operations (Waste) Regulation 2014*, or to any other place that can lawfully accept such waste, except in accordance with Condition E15.	✓	✓	✓	Section 5.1.4 Section 5.5
E103	All waste generated by Works must be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes.	✓	✓	✓	Section 5.2
E104	The Proponent must develop and implement a waste tracking register prior to waste generated by Work that details: (a) The quantity of each type of waste generated, its classification and source location (recorded using latitude and longitude coordinates);	✓	✓	✓	Section 5.4 Appendix B
	(b) The destination location(s) for all wastes generated during construction;	✓	✓	✓	
	(c) The quantities of any waste types imported onto the CSSI site, including their classification and emplacement location (recorded using latitude and longitude coordinates);	✓	✓	✓	
	(d) The quantities and types of wastes that are subject to a Resource Recovery Order and/or Exemption; and	✓	✓	✓	
	(e) Disposal records demonstrating that receiving facilities have lawfully accepted the waste type.	✓	✓	✓	
	The waste tracking register must be made available to the Planning Secretary and EPA on request, within the timeframe stated in the request.	✓	✓	✓	

REMMs

ID	Measure/requirement	Applicability			CWRMP Reference
		M12 West	M12 Central	M12 East	
SC03	A contaminated land management plan (CLMP) will be prepared for the project. The CLMP will include:	✓	✓	✓	CCLMP Section 5.1 Section 5.2 Section 5.3
	• Control measures to manage identified areas of contamination, including surface soils in the vicinity of TP303, TP304, TP310 and TP311 containing heavy metal and PAH concentrations	✓	✓	✓	
	• Procedures for unexpected contamination	✓	✓	✓	
	• Measures to manage potential ASS (as required based on testing results) within sediments of the creeks in the construction footprint to minimise impacts to the environment	✓	✓	✓	
	• Requirements for excavation of unexpected contaminants to be carried out in consultation with project Remedial Actions Plans.	✓	✓	✓	
	• Requirements for the disposal of contaminated waste in accordance with the POEO Act and the Protection of the Environment Operations (Waste) Regulation 2014.	✓	✓	✓	
SC08	All waste will be classified in accordance with the NSW EPA's *Waste Classification Guidelines*, with appropriate records and disposal dockets retained for audit purposes.	✓	✓	✓	Section 5.2 Section 5.4 Appendix C
SWH03	A water reuse strategy will be developed for both construction and operational phases of the project to reduce reliance on potable water. This strategy will be prepared during the detailed design stage and	✓	✓	✓	Section 5.9

ID	Measure/requirement	Applicability			CWRMP Reference
		M12 West	M12 Central	M12 East	
	implemented throughout the project and will outline the construction and operational water requirements and potential water sources to supply the water demand in consultation with Sydney Water. Alternative water supply options to potable water will be investigated, with the aim of reusing water using recycled water where feasible.				
W03	Wherever feasible and reasonable, construction material will be sourced from within the Sydney region.	✓	✓	✓	Section 6.1 Table 7-1 WR4 Appendix C
W04	Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas will be required to be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient area for stockpile storage.	✓	✓	✓	Section 5.1.3 Table 7-1 WR5
GG03	Vegetation removal will be minimised where practicable.	✓	✓	✓	Section 5.7 Table 7-1 GHG1 CFFMP
GG04	The procurement of goods and services will consider goods and services that: • Are from local suppliers • Make use of recycled materials or materials with a low embodied energy content.	✓	✓	✓	Section 6.4 Table 7-1 GHG2

ID	Measure/requirement	Applicability			CWRMP Reference
		M12 West	M12 Central	M12 East	
	• Are energy efficient or have low embodied energy • Minimise the generation of waste				
GG05	Construction plant and equipment will be well maintained to maximise fuel efficiency.	✓	✓	✓	Section 6.2 Table 7-1 GHG3

Appendix B – Template Waste Management Register

Date / time	Source Location (Lat/Long)	Waste classification	Description of waste (e.g. concrete, asphalt, vegetation)	Amount of spoil / waste collected (tonnes)	Transporter (name and waste transport licence, if applicable)	Destination Location (Lat/Long)	Waste use (reused, recycled, stockpiled or disposed)	Invoice no. / tip docket reference

Appendix C – Spoil Management Plan

Appendix B9

Construction Waste and Resources Management Sub-plan

Appendix C – Spoil Management Plan

M12 Motorway

May 2024

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Document control

File Name	M12PPW-ADAP-ALL-EN-PLN-000010_J_S3_CWRMP_AppC
Title	M12 Motorway OCEMP Appendix B9 – Construction Waste and Resources Management Sub-plan, Appendix C – Spoil Management Plan

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Tracey Austin TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
Date 28.06.2024	Date 28/6/2024
Signed [redacted]	Signed [redacted]

Revision history

Revision	Date	Description
A	16/09/2020	First draft for TfNSW review
B	14/10/2020	Response to TfNSW comments
C	30/10/2020	Response to TfNSW comments
D	23/07/2021	Updated with Final NSW CoA
E	04/11/2021	Response to TfNSW and ER comments
F	15/12/2022	Additional design changes updates
G	13/02/2023	Response to TfNSW comments
H	22/03/2023	Response to ER comments
I	10/01/2024	Updated to reflect additional CAs
I.1	18/01/2024	Updated to address minor comments
J	22/03/2024	Updated to address comment from TfNSW, ER and Construction Contractors
J.1	06/05/2024	Updated to address minor comments

Contents

Figures

Tables

Glossary/ Abbreviations

Abbreviations	Expanded text
CoA	Conditions of Approval
Construction	Includes all activities required to construct the CSSI as described in the documents listed in Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B and approved under an environmental management plan(s) in accordance with Condition A24.
CWRMP	Construction Waste and Resources Management Sub-plan
EAD	Environmental Assessment Documentation
EIS	Environmental Impact Statement
EMS	Environmental Management System
ENM	Excavated Natural Material, as defined in *The excavated natural material exemption*
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment

Abbreviations	Expanded text
	• Arcadis (August, 2022) M12 Motorway Minor Consistency Assessment for Proposed Change to the M12 Motorway Project (M12 Central) • Arcadis (September, 2023) M12 Motorway - Devonshire Road Temporary Roundabout Consistency Assessment • WSP (September, 2023) M12 Motorway - Elizabeth Drive Connections Consistency Assessment • TfNSW (September, 2023) M12 Motorway – Minor Consistency Assessment M12 West demolition of structures as 752 Luddenham Road • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East AF9 Power Supply • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Cecil Road Laydown Area • TfNSW (October, 2023) M12 Motorway – Minor Consistency Assessment M12 East Temporary Construction Signage • Arcadis (December, 2023) M12 Motorway – East Site 48, 50 and 51 Boundary Changes Minor Consistency Assessment • Arcadis (January, 2024) M12 Motorway – Minor Consistency Assessment M12 Central Water Tower Access Road The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environmental Protection License
ESR	Construction Contractor Environmental Site Representative
OCEMP	Overarching Construction Environmental Management Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Primary CoA/REMM	CoA/REMM that are specific to the development of this Plan
REMM	Revised Environmental Management Measures
Resource	Resource covers energy, fuel, oil, water and other materials used for construction of the Project

Abbreviations	Expanded text
RRE	Resource Recovery Exemption
RRO	Resource Recovery Order
Secondary CoA/REMM	CoA/REMM that are related to, but not specific to, the development of this Plan
SMP	Spoil Management Plan
TfNSW	Transport for New South Wales (formerly Roads and Maritime Services)
VENM	Virgin Excavated Natural Material
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*

1 Introduction

1.1 Context

This Spoil Management Plan (SMP or Plan) is an Appendix of the Construction Waste and Resources Management Sub-plan (CWRMP) and forms part of the Overarching Construction Environmental Management Plan (OCEMP) for the M12 Motorway (the Project).

This SMP has been prepared to address the requirements of the Revised Environmental Management Measures (REMM) listed in the M12 Motorway Environmental Assessment Documentation and all applicable legislation.

1.2 Background and project description

Refer to Section 2 of the OCEMP for a complete Project description.

Refer to Section 1.2 of the CWRMP for background of waste and resource management for the Project.

1.3 Scope of the SMP

The scope of this SMP is to describe how the Construction Contractor proposes to manage potential impacts related to the management and transport of spoil generated during construction of the Project.

1.4 Environmental Management Systems overview

The overarching Environmental Management System (EMS) for the Project is described in Section 3 of the OCEMP. The Construction Contractor delivering the Project will have a certified EMS consistent with the overarching EMS described in the OCEMP. The Construction Contractor will develop a stage-specific SMP in accordance with the OCEMP, the CWRMP and their EMS.

This overarching SMP forms part of the environmental management framework for the Project, as described in Section 3.3 of the OCEMP.

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how the Construction Contractor propose to manage spoil during construction of the Project.

2.2 Objectives

The objective of the SMP is to ensure that all avoidance, mitigation and management measures relevant to waste and resource use is managed as described in:

- The Environmental Assessment Documentation prepared for M12 Motorway
- NSW Conditions of Approval (CoA) granted to the Project on 23 April 2021
- Commonwealth CoA granted to the Project on 3 June 2021
- TfNSW Specifications.

2.3 Targets

TfNSW and its Construction Contractors are committed to ensuring the responsible management of unavoidable waste and promoting the reuse of such waste in accordance with the resource management hierarchy principles outlined in the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). The targets established for the management of waste and resources impacts during the Project are consistent with these resource management hierarchy principles, which are, in order of priority:

- Avoid the unnecessary production of waste during construction
- Resource recovery (including reuse, reprocessing, recycling and energy recovery)
- Dispose of waste materials in accordance with legislative requirements.

By adopting the above principles, the Construction Contractor aims to efficiently reduce resource use, reduce costs, and reduce environmental harm in accordance with the principles of ecologically sustainable development.

The following additional targets have been established for the management of waste impacts during construction of the Project:

- Minimise energy use and greenhouse gas emissions
- Optimise resource efficiency and waste management
- Efficiently manage water
- Minimise pollution generated by the Project.

Additionally, the Project will achieve the waste reuse / recycling targets nominated in Table 2-1 of the CWRMP.

The overarching Sustainability Strategy embeds sustainability objectives, commitments and targets into the Project delivery management systems. The Sustainability Strategy complements the purpose, objectives and targets of the CWRMP and this SMP.

3 Environmental Requirements

3.1 Relevant legalisation and guidelines

3.1.1 Legalisation

All legislation relevant to this CWRMP and SMP is included in Appendix A1 of the OCEMP. Legislation considered during the development of this SMP includes:

- *Environmental Planning and Assessment Act 1979* (EP& A Act)
- *Protection of the Environment Operations Act 1997 (*POEO Act*)*
- *Protection of the Environment Operations (General) Regulation 2009*
- *Protection of the Environment Operations (Waste) Regulation 2005*
- *Waste Avoidance and Resource Recovery Act 2001 (*WARR Act*).*

3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Plan include:

- TfNSW Specification G36 – Environmental Protection (Management System)
- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (Environment Protection Authority (EPA), 2014)
- Waste Classification Guidelines (EPA, 2014)
- NSW Government Resource Efficiency Policy (Office of Environment and Heritage, 2014)
- Australian Code for the Transport of Dangerous Goods by Road and Rail (National Transport Commission, 2008)
- Environmental Sustainability Strategy 2019-2023 (Roads and Maritime, 2019)
- Managing Urban Stormwater (“The Blue Book”) (Landcom, 2004)
- Management of wastes on TfNSW land (TfNSW, 2014)
- Management of road construction and maintenance wastes (TfNSW, 2016)
- Technical Direction: Legal offsite disposal of TfNSW Waste (TfNSW, 2015)
- Technical Direction: Coal tar asphalt handling and disposal (TfNSW, 2015)
- Stockpile Site Management Guideline (TfNSW, 2011)
- Roads and Maritime waste fact sheets:
    - Waste Fact Sheet 1 – Virgin Excavated Natural Material
    - Waste Fact Sheet 2 – Excavated Natural Material
    - Waste Fact Sheet 3 – Excavated Public Road Materials
    - Waste Fact Sheet 4 – Recovered Aggregates
    - Waste Fact Sheet 5 – Asbestos Waste
    - Waste Fact Sheet 6 – Waste Sampling

- Waste Fact Sheet 7 – Reclaimed asphalt pavement
- Waste Fact Sheet 9 – Re-use of waste off-site.

- NSW EPA orders and exemptions
  - Compost Exemption 2016
  - Effluent Exemption 2014
  - Pasteurised Garden Organics Exemption 2016
  - The Excavated Natural Material Exemption 2014
  - The Excavated Public Road Material Exemption 2014
  - The Mulch Exemption 2016
  - The Recovered Aggregate Exemption 2014
  - The Blast Furnace Slag Exemption 2014
  - The Reclaimed Asphalt Pavement Exemption 2014
  - Treated Drilling Mud Exemption 2011
  - Stormwater Exemption 2014.
- PS311 – Environmental Design and Compliance.

3.2 NSW Conditions of Approval

There are no primary NSW CoA relevant to the development of this Plan.

3.3 Revised Environmental Management Measures

The primary REMMs relevant to the development of this Plan are listed in Table 3-1 below.

Table 3-1: Environmental management measures relevant to this SMP

ID	Measure/requirement	Timing	Applicability			SMP Reference
			M12 West	M12 Central	M12 East	
W02	A Spoil Management Plan will be prepared for the Project as part of the CWRMP and in line with the CSWMP. The Spoil Management Plan will outline appropriate management procedures for the generation and importation of spoil. It will include, but not be limited to: • Procedures for classification of spoil	Prior to construction	✓	✓	✓	Section 5.1
	• Identification of spoil reuse measures		✓	✓	✓	Section 5.2
	• Spoil stockpile management procedures		✓	✓	✓	Section 5.3
	• Spoil haulage routes		✓	✓	✓	Section 5.4
	• Spoil disposal and reuse locations		✓	✓	✓	Section 5.5
	• Imported spoil sources and volumes.		✓	✓	✓	Section 5.6

3.4 TfNSW Specifications

TfNSW Specifications are a key source of environmental protection management processes relevant to this SMP. These include:

- G36 – Environmental Protection

The Specifications set out environmental protection requirements, including Hold Points that must be complied with by the Construction Contractor during construction of the Project. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW. Further information on Hold Points is presented in Section 3.4 of the CWRMP.

4 Environmental aspects and impacts

4.1 Required earthworks quantities

Indicative quantities of spoil required to carry out earthworks for construction of the Project are presented in Table 4-1.

Table 4-1: Approximate bulk earthworks quantities

Type of material	Approximate quantity (m^3)
Total fill material required	3,642,076
Total cut material to be excavated	2,560,114
Total fill deficit[1] to be imported	1,081,962
Topsoil (balance)	377,298
Select material zone (SMZ) (import)	227,969
Pavement (import)	154,870

4.2 Construction spoil related impacts

The potential environmental impacts associated with construction spoil use for the Project include:

- Generation of large volumes of construction waste, such as excavated soil and rock
- Mixing of suitable and unsuitable material/contaminated material leading to materials that would have ordinarily been reused being rendered as waste
- Inappropriate disposal of hazardous waste
- Generation or spread of contaminated waste/soils, e.g. groundwater, used or expired chemicals, or spoil
- Disturbance of contaminated soils
- Adverse effects on flora and fauna due to contamination of water or soils
- Water pollution due to sediment runoff from soil excavation and excess spoil storage
- Weed infestation from dispersion of seeds and so forth during clearing and access upgrading activities

The mismanagement of waste streams has the potential to result in the following impacts:

- Excessive waste being directed to landfill
- Various type of waste being generated and stored on site, with the potential for misclassification

[1] Total fill material minus total cut material

- Water pollution
- Land contamination.

Waste classification will be required during construction to determine appropriate spoil management and disposal, as detailed in Section 5.

Refer to the Aspects and Impacts Register included in Appendix A2 of the OCEMP and Section 7 of the CWRMP for further detail on construction spoil related impacts. A full list of management measures is included in Section 5.7 of this SMP to manage the construction spoil related impacts.

5 Spoil Management

5.1 Procedures for classification of spoil

Spoil imported to the site will be restricted to:

- Virgin excavated natural material (VENM) defined in accordance with Schedule 1 of the *Protection of the Environment Operations Act 1997*
- Excavated natural material (ENM) classified in accordance with *The excavated natural material exemption* (NSW EPA 2014c)
- Other material approved in writing by EPA.

Approximately, 1,081,962 cubic metres (m^3) of imported spoil is likely to be required to construct the Project (refer to Section 5.6), and will be sourced from existing infrastructure projects within Sydney, most probably tunnel excavations.

All imported spoil, entering the Project site must be accompanied by a waste classification report completed by the supplier. Material characterisation will occur before being imported to the Project site in accordance with the *Waste Classification Guidelines: Part 1 Classifying Waste* (NSW EPA 2014). A s143 Notice and Waste Acceptance form will be completed before importation of spoil from each new spoil source. The section 143 Notice and Waste Acceptance form will be completed by the supplier and signed by the receiver of the imported spoil (refer to Table 5-3).

Before and during importation of VENM or ENM, visual inspection must be undertaken to verify that the appearance of the material is consistent with the source material description.

No imported spoil is permitted to enter the site without providing a waste classification report.

5.2 Identification of spoil reuse measures

Spoil reuse measures for the different types of material required for construction of the Project are presented in Table 5-1.

Table 5-1: Spoil reuse and management options

Type of material	Approximate quantity (m^3)	Reuse and management options
Total fill material requires	3,642,076	Where possible, source on-site from cuts required for the Project. Alternatively, use imported material, to be sourced locally where practical.
Total cut material to be excavated	2,560,114	It is anticipated that all suitable excavated material would be reused within the site as general fill either within the same section of work or elsewhere along the Project. Cut-to-fill haulage of this nature will generally be carried out using internal haul roads, so that haulage does not contribute to traffic volumes on existing roads. Where it cannot be reused on site, material will be managed in the following order of priority: 1. Transfer to other TfNSW projects for reuse in accordance with the NSW EPA's excavated public road resource recovery order and exemption

Type of material	Approximate quantity (m^3)	Reuse and management options
		2. Transport off-site for reuse by a third party in accordance with the relevant NSW EPA resource recovery order and exemption or to an NSW EPA licensed waste recovery facility 3. Dispose at an accredited materials recycling or waste disposal facility. Where excavated material is deemed unsuitable for reuse or emplacement due to contamination, it will be taken to a waste facility licensed to accept the waste.
Total fill deficit[2] to be imported	1,081,962	Import material, locally sourced where practical
Topsoil (balance)	377,298	Where possible, topsoil stripped would be reused on site. Any material to be removed from site would be managed in accordance with the measures outlined in the CRWMP.
Select material zone (SMZ) (import)	227,969	Import material, locally sourced where practical
Pavement (import)	154,870	Import material, locally sourced where practical
Contaminated material	26,229	Manage in accordance with CCLMP (encapsulation or off-site disposal).

5.3 Spoil stockpile management procedures

Stockpiling of spoil was assessed in Section 5.2.3 of the EIS and Section 6.15.2.2 of the Amendment Report. Stockpiles will be established for the Project as detailed in Table 5-2.

Table 5-2: Stockpile locations for the Project

Location (ancillary facility)	Approximate quantity (m^3)
AF1	60,000
AF2	1,468,000
AF3	333,000
AF9	233,000
AF10	41,000
AF11	92,000
Total	**2,227,000**

Stockpiles for spoil will be established and managed in accordance with the *Stockpile Site Management Guideline* (TfNSW, 2011):

- More than 50 metres from a waterway
- Within or adjacent to land where the Project is being carried out

[2] Total fill material minus total cut material

- Have ready access to the road network
- Are on relatively level land
- Do not require vegetation clearing beyond that already required for the Project
- Are above the one in 20–year ARI flood level unless a contingency plan to manage flooding is prepared and implemented
- Provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours.

Spoil will be transported between ancillary sites along the length of the Project and to offsite reuse or disposal locations (refer to Section 5.5). The location of ancillary sites, on or adjacent to land where the Project is being carried out and that have ready access to the road network, will minimise potential impacts associated with the transportation of earthworks.

5.4 Spoil haulage routes

Haulage routes for the Project were assessed in the Environmental Assessment Documentation including Section 5.24.17 of the EIS and Section 4.2.6 of the Amendment Report. Refer to Figure 5-1 for the spoil haulage routes for the Project.

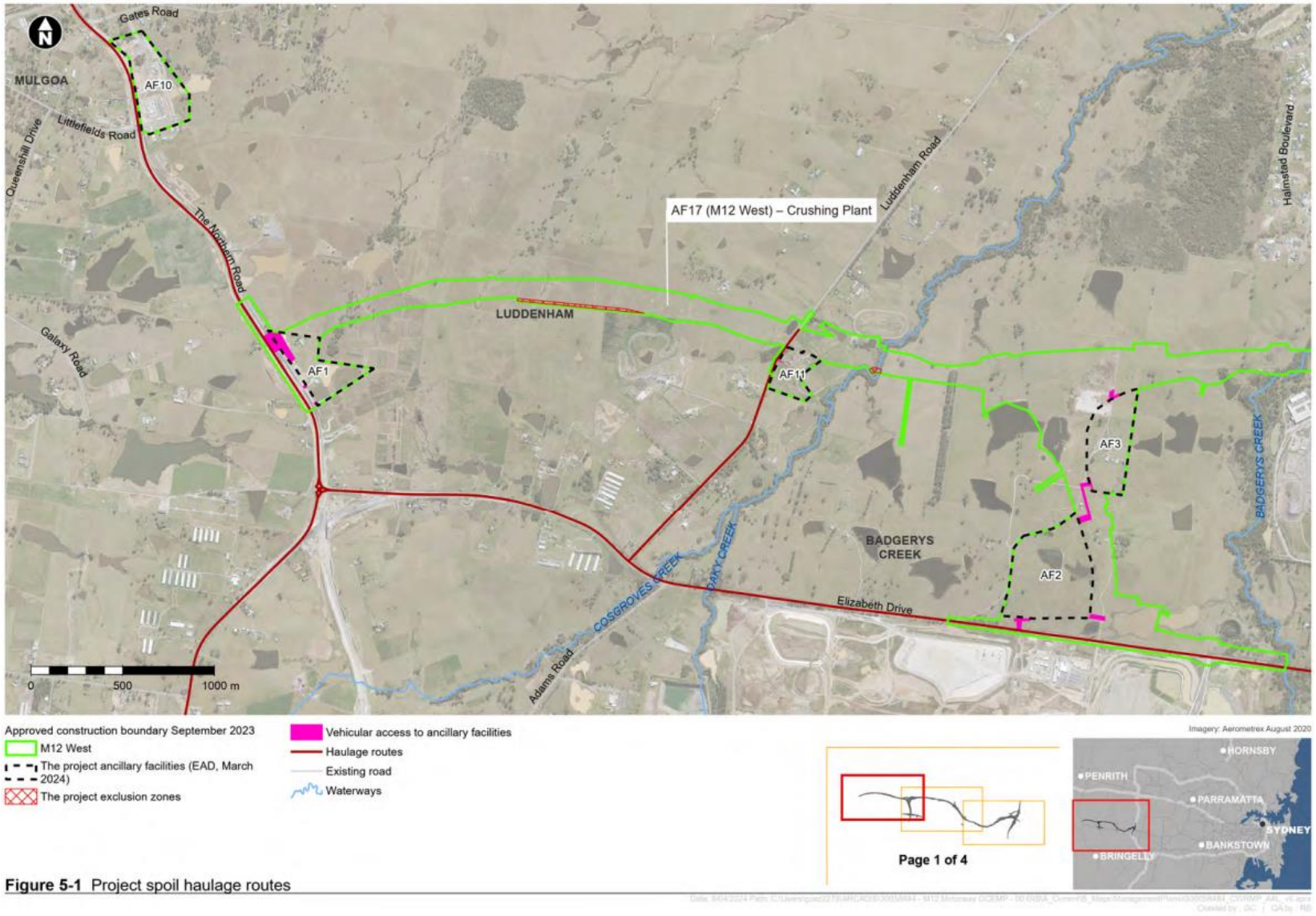

Figure 5-1 Project spoil haulage routes

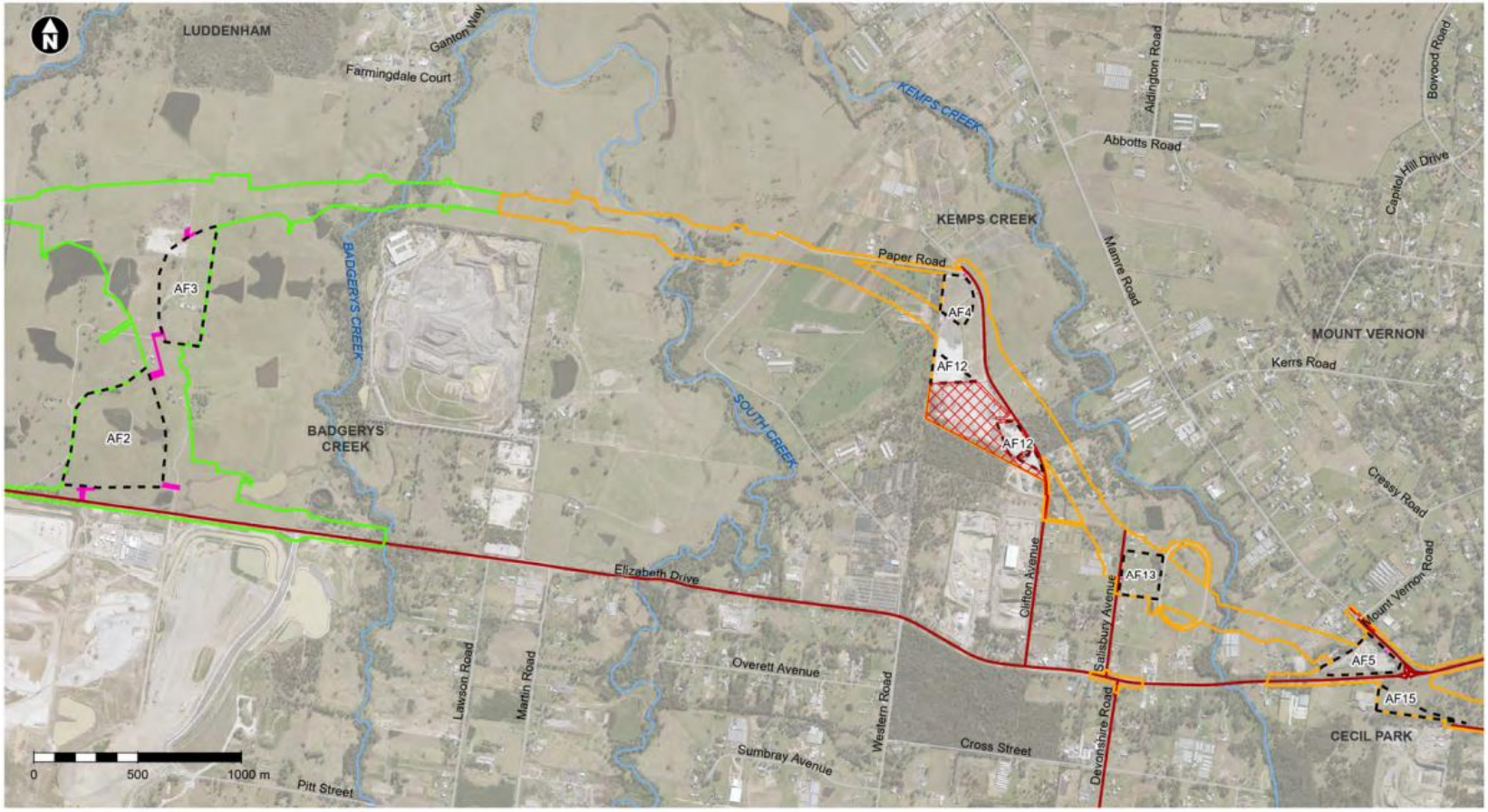

Figure 5-1 Project spoil haulage routes

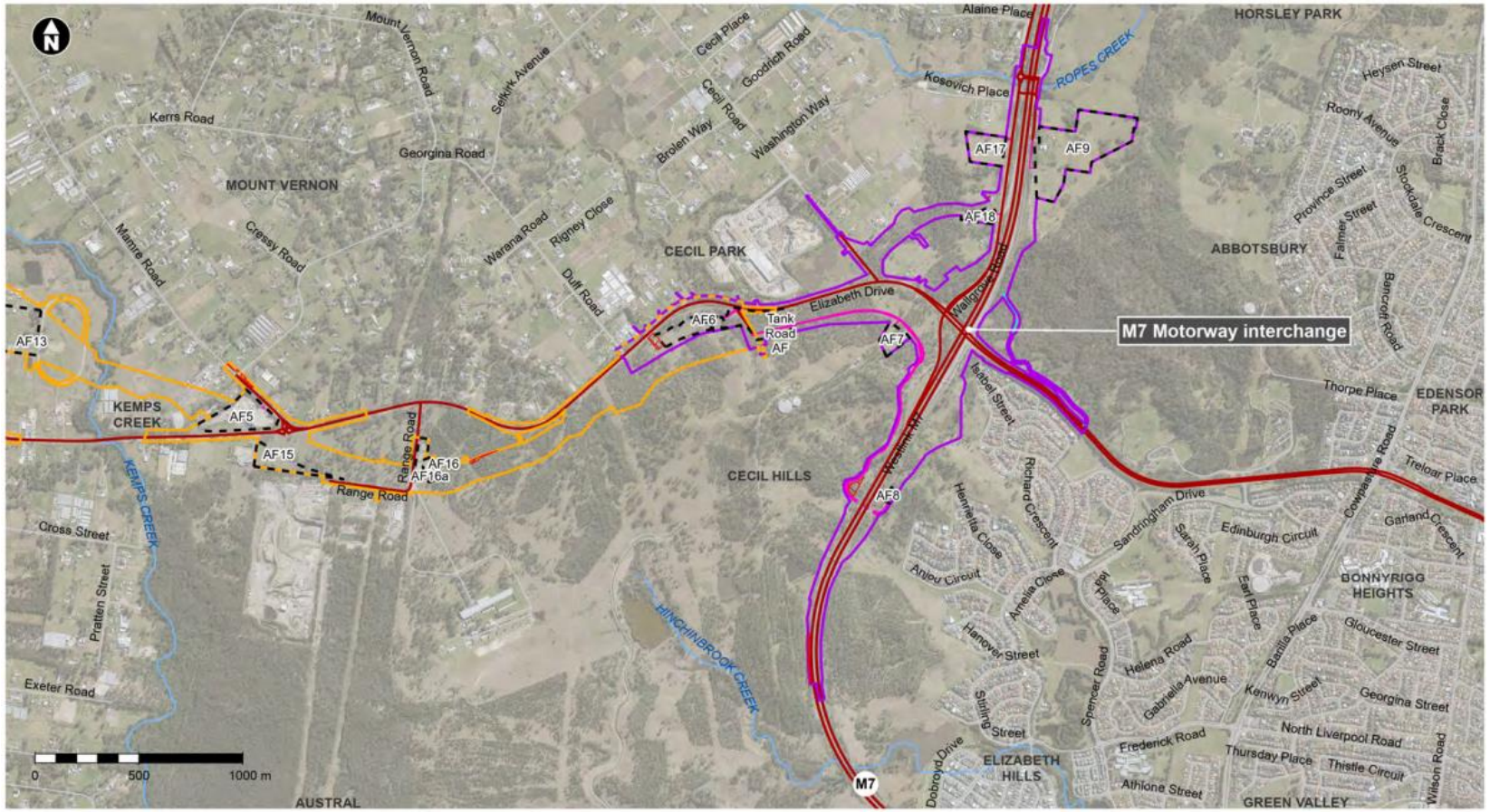

Figure 5-1 Project spoil haulage routes

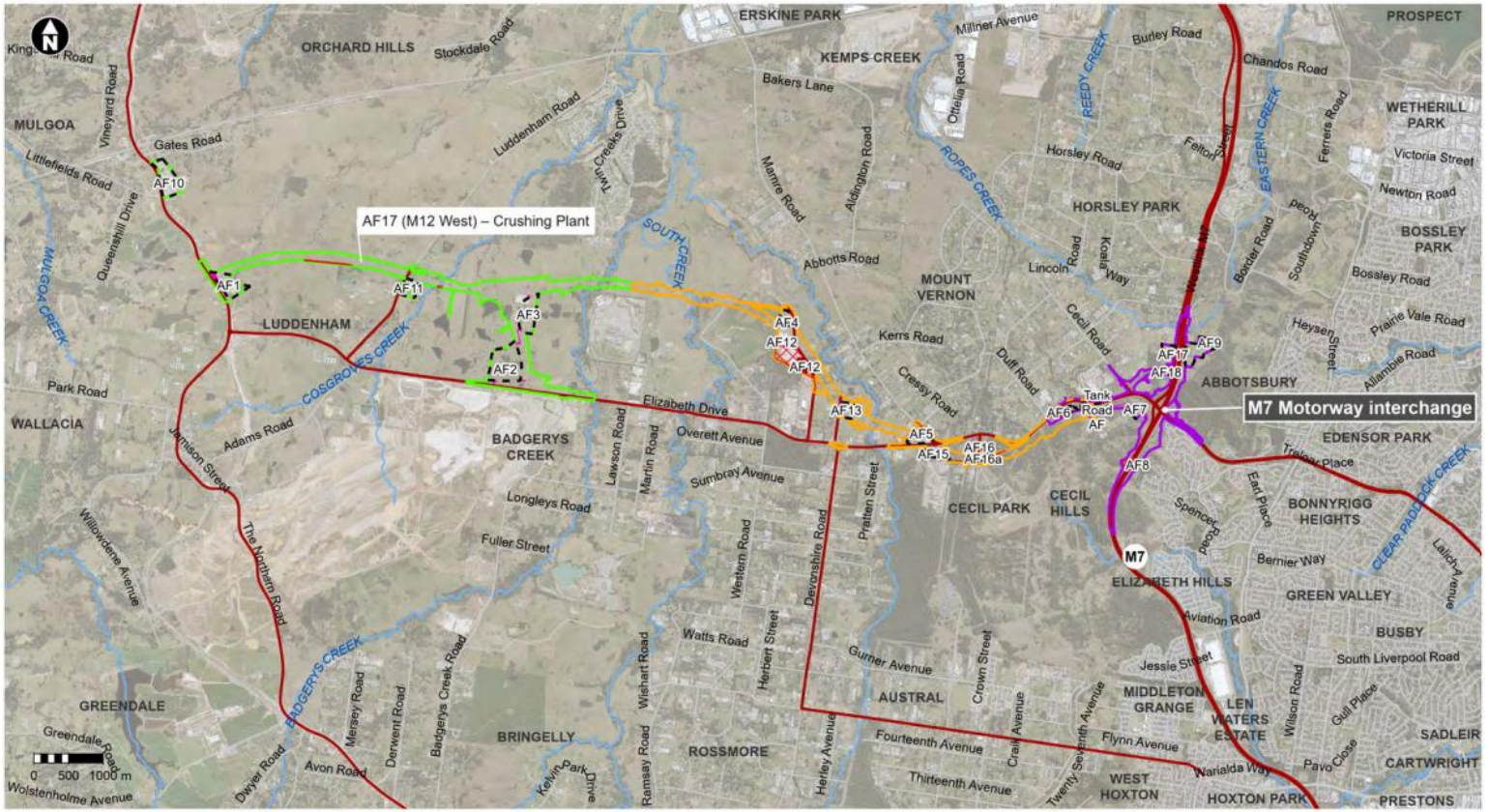

Figure 5-1 Project spoil haulage routes

Figure 5-1 Project spoil haulage routes

5.5 Spoil disposal and reuse locations

Potential spoil disposal and reuse options were assessed in Section 8.5.3 of the EIS and Section 16.5.2.3 of the Amendment Report. The selection of waste disposal and recovery facilities would be dependent on the nature and volume of waste streams generated and the capacity of the receiving facilities at the time of the waste generation. The NSW EPA Recovery orders and exemptions will also be applied under s143 of the POEO Act for spoil reuse. This includes the reuse of spoil for other projects or developments where approved.

Spoil disposal locations suitable excess spoil include:

- St Marys Resource Recovery Facility
- Cleanaway Erskine Park Resource Management Facility
- Boral Widemere Resource Recovery Facility, Wetherill Park
- Bettergrow Resource Recovery Facility, Wetherill Park.

5.6 Imported spoil sources and volumes

The Detailed Design Report by GHD (2021) identified that a total of approximately 1,081,962 cubic metres of spoil would need to be imported to facilitate the construction of the Project. These quantities have been updated since the Environmental Assessment Documentation. Where practicable this imported spoil would be locally sourced to minimise impacts to transport and traffic, air quality and waste and resources.

5.7 Spoil management measures

Specific measures and requirements to address spoil issues are outlined in Table 5-3 below.

Table 5-3: Spoil management and mitigation measures

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
Spoil management								
SP1	Spoil imported to site is restricted to VENM or ENM, or other material approved under a Resource Recovery Order (RRO) and Resource Recovery Exemption (RRE). Material characterisation of the imported spoil will occur before being exported to the Project site by the producer of the material at source, in accordance with the latest version of the *Waste Classification Guidelines Part 1: Classifying Waste* (NSW EPA 2014) and this Plan.	During construction	Construction Contractor ESR Construction Contractor Superintendent Construction Contractor's Foreman/ Site Supervisor	✓	✓	✓	NSW CoA E101 TfNSW Specification *Waste Classification Guidelines* (EPA, 2014)	s143 Form Waste Classification Reports WateWaste Register
SP2	A s143 Notice and Waste Acceptance form will be completed before importation of spoil from each new spoil source. The form will be completed by the supplier and signed by the receiver of the imported spoil and will include volumes of imported spoil.	During construction	Construction Contractor ESR Construction Contractor's Site/Project Engineer	✓	✓	✓	TfNSW Specification	s143 Form Waste Acceptance Form
SP3	Waste generated outside the Project will not be received at the site for storage, treatment, processing, reprocessing, or disposal unless it satisfies the CoA or EPL.	During construction	Construction Contractor ESR Construction Contractor Superintendent Construction Contractor's Foreman/ Site Supervisor	✓	✓	✓	NSW CoA E101 and E102	Site inspection records Waste register Waste Acceptance Form

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
SP4	All sampling and waste classification reports will be retained for the life of the development in accordance with the requirements of the EPA.	During construction	Construction Contractor ESR Construction Contractor's Site/Project Engineer	✓	✓	✓	NSW CoA E103 and E104 TfNSW Specification	Availability of records
SP5	Wherever feasible and reasonable, spoil will be sourced from within the Sydney region.	During construction	Procurement Team	✓	✓	✓	REMM W03	Procurement Strategy
Transportation of spoil								
SP6	All trucks entering or leaving the site will have their loads covered.	During construction	Construction Contractor Superintendent Construction Contractor's Foreman/ Site Supervisor	✓	✓	✓	TfNSW Specification	Induction and training records Site inspection records
SP7	Trucks will keep public roads clean and must not track dirt onto public roads.	During construction	Construction Contractor's Foreman/ Site Supervisor	✓	✓	✓	TfNSW Specification	Induction and training records Site inspection records
Stockpiling								
SP8	The management principles outlined in *Managing Urban Stormwater* ("The Blue Book") (Landcom, 2004) for sites with stockpiles will be implemented. Stockpiles for spoil will be established and managed in accordance with the following criteria:	Prior to construction and during construction	Construction Contractor ESR Construction Contractor Superintendent	ü	✓	✓	*Stockpile Site Management Guideline* (TfNSW, 2011)	Site inspection records

ID	Management Measure	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	• More than 50 metres from a waterway • Within or adjacent to land where the Project is being carried out • Have ready access to the road network • Are on relatively level land • Do not require vegetation clearing beyond that already required for the Project • Are above the one in 20–year ARI flood level unless a contingency plan to manage flooding is prepared and implemented • Provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours.		Construction Contractor's Foreman/ Site Supervisor				*Managing Urban Stormwater* (Landcom, 2004)	