

APPENDIX B7

Construction Waste and Energy Management Sub Plan Sancrox Traffic Arrangement Project (The Project)

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Contents

1	Introduction	1
1.1	Context	1
1.2	Background.....	1
1.3	Environmental management systems overview	1
2	Purpose and objectives	2
2.1	Purpose	2
2.2	Objectives.....	2
2.3	Targets	2
3	Environmental requirements.....	6
3.1	Relevant legislation and guidelines	6
3.1.1	Legislation	6
3.1.2	Guidelines and standards	6
3.2	Minister’s Conditions of Approval	6
3.3	Statement of Commitments.....	8
4	Environmental aspects and impacts	10
4.1	Construction waste streams and energy use.....	10
4.2	Impacts.....	10
5	Waste and energy management	12
5.1	Waste management register	12
5.2	Classification of waste streams.....	12
5.3	Waste exemptions	13
5.4	Classification of potential waste streams.....	14
5.5	Waste avoidance/reduction.....	15
5.6	Reuse and recycling	16
5.7	Waste Handling and Storage	16
5.8	Waste Disposal.....	16
5.9	Energy Conservation	16
6	Environmental Mitigation and Management.....	17
7	Compliance management	22
7.1	Roles and responsibilities	22
7.2	Training.....	22
7.3	Monitoring and inspection	22
7.4	Auditing.....	22
7.5	Reporting	22
8	Review and improvement.....	23
8.1	Continuous improvement	23
8.2	CWEMP plan update and amendment.....	23
	Cairncross Waste Management Facility.....	25

Tables

Table 2-1 Construction waste streams and targets	3
Table 3-1 Conditions of Approval relevant to the CWEMP	7
Table 3-2 Statements of commitment relevant to this CWEMP	8
Table 5-1 Resource recovery exemptions	13
Table 5-2 Classification of potential waste streams	14
Table 6-1 Management and mitigation measures.....	17
Table A-1 Waste Contact List.....	25

Appendices

- Appendix A** Waste contact list
- Appendix B** Location of waste facilities
- Appendix C** Waste management register

Glossary/Abbreviations

C&D	Construction and Demolition
CEMP	Construction Environmental Management Plan
CoA	Condition of Approval
CWEMP	Construction Waste and Energy Management Sub Plan
DECC	NSW Department of Environment and Climate Change. <i>Note: DECC is a defunct name. Now it is responsibility of The New South Wales Office of Environment and Heritage (OEH).</i>
DECCW	NSW Department of Environment, Climate Change and Water. <i>Note: DECC is a defunct name. Now it is responsibility of The New South Wales Office of Environment and Heritage (OEH).</i>
E&SC	Erosion and Sedimentation Control
EA	Environmental Assessment
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
ER	Environmental representative
ESR	FAA Environmental Site Representative
EWMS	Environmental Work Method Statements
FAA	Ferrovial Agroman Australia
OEH	NSW Office of Environment and Heritage
PM	FAA Protect Manager
PoEO Act	Protection of the Environment Operations Act 1997 (NSW)
PoEO (Waste) Regulation	Protection of the Environment Operations (Waste) Regulation 2005 (NSW)
Principal, The	Roads and Maritime Services
Project, The	Sancrox Traffic Arrangement Project
Roads and Maritime	Roads and Maritime Services
Q&E Manager	FAA Quality and Environmental Manager
SCC	Specific Contaminant Concentrations
SoC	Statement of commitments
VENM	Virgin Excavated Natural Material
WRAPP	NSW Waste Reduction and Purchasing Policy
WARR Act	Waste Avoidance and Resource Recovery Act 2001 (NSW)
WARR Strategy	NSW Waste Avoidance and Resource Recovery Strategy, 2007

1 Introduction

1.1 Context

This Construction Waste and Energy Management Sub Plan (CWEMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Sancrox Traffic Arrangement (the Project) works which is part of the upgrade of the Pacific Highway between Oxley Highway and Kempsey.

This CWEMP has been prepared to address the relevant requirements of the Minister's Conditions of Approval (CoA), the Roads and Maritime's Statement of Commitments (SoC), the mitigation and management measures listed in the Oxley Highway to Kempsey Environmental Assessment (EA) and all applicable legislation.

1.2 Background

The *Oxley Highway to Kempsey – Upgrading the Pacific Highway – Environmental Assessment* (Roads and Maritime 2010), assessed the impacts of construction in terms of waste generation and energy use (in relation to greenhouse gas emissions) within chapter 20 (specifically sections 20.5 and 20.7).

The EA identified the various waste streams that would be generated during the construction of the Project, including soil and rock waste, wastewater, sewerage from the site compound, litter, fuels and oils. It also identified opportunities to reduce, reuse and recycle waste.

The EA identified the main sources of greenhouse gas emissions for the Project (fuel used by construction plant and equipment, vegetation clearance, embodied emissions in construction materials and transportation of materials to the construction site) and estimated the quantity of these emissions. Measures to reduce greenhouse gas emissions during construction were identified.

1.3 Environmental management systems overview

The overall Environmental Management System for the Project is described in the Construction Environmental Management Plan (CEMP).

The CWEMP is part of the Ferrovia Agroman Australia (FAA) Environmental Management framework for the Project, as described in Section 4.1 of the CEMP. Management measures identified in this CWEMP will be incorporated into site or activity specific Environmental Work Method Statements (EWMS).

EWMS will be developed and signed off by environment and management representatives prior to associated works and construction personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the CEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by FAA personnel and contractors.

The review and document control processes for this CWEMP are described in Chapter 9 and 10 of the CEMP.

2 Purpose and objectives

2.1 Purpose

The purpose of this CWEMP is to describe how for the Project, FAA proposes to minimise:

- The amount of waste for disposal and
- Energy consumption during construction.

2.2 Objectives

The key objective of the CWEMP is to ensure that waste for disposal and energy use are minimised. To achieve this objective, FAA will undertake the following:

- Ensure measures are identified and implemented to minimise 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 staff with an increased level of understanding and awareness of waste and resource use management issues.
- Ensure appropriate measures are implemented to address the relevant CoA and SoC outlined in Table 3.1 and Table 3.2, and the mitigation measures detailed in the EA.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this CWEMP.

2.3 Targets

The following targets have been established for the management of waste and energy consumption during the project:

- Avoid the unnecessary production of waste where practical to do so, in accordance with the waste hierarchy as set out by the *Waste Avoidance and Resource Recovery Act 2001*.
- Minimise/reduce the quantities of resources to be used.
- Dispose of waste materials in accordance with legislative requirements.
- Achieve the waste re-use/recycling targets nominated in Table 2-1.

Table 2-1 Construction waste streams and targets

Construction Activity	Waste Type	Waste Classification	Likely quantity	Reuse/recycle or disposal methods	Reuse / Recycle Target
Earthworks	Acid Sulphate Rock Materials(ASR)	Hazardous Waste* or General Solid Waste(Non Putrescible)*	50m ³	*Prior to disposal Acid Sulphate suspected materials shall be tested to determine It's waste classification. Material shall be separately stockpiled pending testing if then classified if ASR it shall be treated and disposed of in accordance with the Contaminated Land Procedure / Acid Sulphate Material Management Procedure. If test results show non ASR material can be disposed of as below-Earthworks- spoil.	100%
Earthworks	Spoil	General Solid Waste (non-putrescible)	35,000 m ³	Excess to the project spoil shall be stored pending reused on other Roads and Maritime Projects	100%
Earthworks	Topsoil Contaminated with weeds	General Solid Waste (non-putrescible)	TBA	Separately stockpiled and treated in accordance with the Construction Flora and Fauna Management Plan (CFFMP). If disposal is required it shall be transferred to a licensed waste facility	100%
Mobile Plant	Exhaust emissions	Gaseous emissions to atmosphere	30m3	Release to atmosphere- mobile plant to provide service records to minimise exhaust emissions	0%
Site compound	Office Waste Toners, Paper, Food Scraps, etc.	General Solid Waste (non-putrescible)	General waste 0.1 m ³ /month, Recycle Waste 1 m ³ /month	Toners collected by company such that refills and reuses Clean office paper reused as scrap paper or placed in proprietary type waste bins for recycling All other office waste shall be placed in proprietary type waste bins and removed by the waste disposal subcontractor	0% 85% 0%
Site compound	Sewage Ablution waste	Liquid	30,000 litres/month	Ablution waste will be removed from site by the waste disposal subcontractor on a regular basis	0%
Clearing and Grubbing	Green Waste Vegetation, Trees, etc.	General Solid Waste (non-putrescible)	1000m ³	Cleared vegetation will be reused or recycled to the greatest extent practicable. Including mulching of vegetation for use in landscaping Vegetation greater than 200mm diameter, that are considered by the ecologist suitable for microhabitat and will be relocated to suitable nearby bushland areas as directed by the project ecologist. Donation of other timber to community groups.	100 %
Clearing and Grubbing	Green Waste Weeds	General Solid Waste (non-putrescible)	4000m ³ ,	Weeds will be managed, handled and disposed of in accordance with the Weed Management Strategy. If disposal is appropriate, the weed material will be transferred to a licensed waste facility	0%
Road Construction	General & Recyclable Waste Paper, Glass, Plastic, Silt Fences, Survey Pegs, Aluminium Cans, Hessian Bags, etc.	General Solid Waste (non-putrescible)	3m ³ per month	Paper plastic, glass, metals placed in Proprietary Type Recycle Bins provided by the waste subcontractor at various locations on site including the main site storage compound. Non-recyclable waste, e.g. kitchen waste, non-recyclable packaging etc. placed in Proprietary Type Waste Bins provided by the waste subcontractor at various locations on site including the main site storage compound.	80%

Construction Activity	Waste Type	Waste Classification	Likely quantity	Reuse/recycle or disposal methods	Reuse / Recycle Target
Road construction	Construction Waste Asphalt, Concrete, Metal, Culverts, Steel, Timber, Steel Straps, Rope, Guide Posts, Guard Rails, etc.	General Solid Waste (non-putrescible)	----	The reuse and/or recycling on site of waste materials generated on site will be maximised as far as practicable. Alternatively they will be sent off site for recycling. <ul style="list-style-type: none"> - Some of the timber and formwork may be salvaged for reuse on site or for reuse on future projects - Roadside materials will be recycled or reused where possible - Pavement materials and asphalt will be reused (such as through processing when possible) 	90% 0% 90%
Road Construction	Tyres	Special Waste	5-10 tyres	Removal by licenced waste disposal contractor	0%
Road construction	Contaminated Absorbent Products Sand, Soil and Proprietary Absorbent Products Contaminated With Chemicals, Oil and Fuel, Hydraulic Hoses, etc.	Hazardous Waste	30 m ³	Placed and sealed in empty drums or containers and stored on pallets at the main site storage area for removal by licenced subcontractors	0%
Road construction	Empty Containers Used for Herbicides, fuel, lubricant and Other Hazardous Chemicals	Hazardous Waste	5 litres/month	Stored in appropriate containers in locked storage areas and disposal by licensed contractors	0%
Road construction	Waste Fuel & Oil	Liquid	10 litres/month	Storage in a sealed container in bunded areas for removal by the waste disposal subcontractor for waste oil recycling	0%
Road construction	Wastewater Site Run-Off Water Captured in Sediment Basins	Liquid	---	Sediment basin and collected stormwater will be reused on site for dust suppression, watering of landscaped areas and any other suitable construction activity when of appropriate quality, here feasible	90%
Road construction	Sediment removed from sediment basins	General solid waste (non-putrescible)	200-300 Ton/year	Sediment removed from sediment basins will be collected and reused on site as general fill material or it will be incorporated within landscaping materials where possible.	100 %
Road	Removal of	General solid waste (non-	200 m ³	Separately stockpiled at various locations on site before disposal	0 %

Construction Activity	Waste Type	Waste Classification	Likely quantity	Reuse/recycle or disposal methods	Reuse / Recycle Target
construction	redundant utility services	putrescible)		by subcontractor:	
Road construction	Concrete washout water (from concrete trucks)	Liquid	100 m ³	Concrete will be reused (such as through processing when possible) by offsite recycler	0 %

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation and regulations relevant to waste and energy management includes:

- Protection of the Environment Operations Act 1997.
- 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).
- Contaminated Land Management Act 1997.
- National Greenhouse and Energy Reporting Act 2007
- Noxious Weeds Act 1993.
- Environmentally Hazardous Chemicals Act 1985.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the CEMP.

3.1.2 Guidelines and standards

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

- Waste Classification Guidelines, DECCW (2009).
- NSW Waste Avoidance and Resource Recovery Strategy 2007.
- NSW Waste Reduction and Purchasing Policy (1997).
- Best Practice Waste Reduction Guidelines for the Construction and Demolition Industry (Tools for Practice), Natural Heritage Trust, 2000.
- Storing and Handling Liquids: Environmental Protection - Participants Manual. Department of Environment & Climate Change.
- Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management - Part B Review of Best Practice and Regulation. Department of Environment and Conservation NSW.

3.2 Minister's Conditions of Approval

The CoA relevant to this Plan are listed Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other project management documents.

Table 3-1 Conditions of Approval relevant to the CWEMP

CoA No.	Condition Requirements	Document Reference
B30	The Proponent shall prepare and (following approval) implement a Construction Environmental Management Plan for the project. The Plan shall outline the environmental management practices and procedures that are to be followed during construction, and shall be prepared in consultation with the relevant agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans. The Plan shall include, but not necessarily be limited to;	Table 6-1
B30 (e) (v)	Measures to monitor and manage waste generated during construction including but not necessarily limited to: general procedures for waste classification, handling, reuse, and disposal; use of secondary waste material in construction wherever feasible and reasonable; procedures for dealing with green waste including timber and mulch from clearing activities; and measures for reducing demand on water resources (including the potential for reuse of treated water from sediment control basins);	Table 6-1
C24	The Proponent shall not cause, permit or allow waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the <i>Protection of the Environment Operations Act 1997</i> , if such a licence is required in relation to that waste.	Table 6-1
C25	The Proponent shall maximise the reuse and/or recycling of waste materials generated on site as far as practicable, to minimise the need for treatment or disposal of those materials off site.	Table 6-1
C26	The Proponent shall ensure that liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with Waste Classification Guidelines (Department of Environment and Climate Change, 2008) and where removed from the site is directed to a waste management facility lawfully permitted to accept the materials.	Table 6-1
C27	<p>The Proponent shall store and handle dangerous goods, as defined by the Australian Dangerous Goods Code, strictly in accordance with:</p> <ol style="list-style-type: none"> a. relevant Australian Standards; b. for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and c. the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, Technical Bulletin (Environment Protection Authority, 1997). <p>In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.</p>	Table 6-1

3.3 Statement of Commitments

Relevant SoC are listed in Table 3-2 below. This includes reference to required outcomes the timing of when the commitment applies and relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-2 Statements of commitment relevant to this CWEMP

Outcome	Ref #	Commitment	Timing	CWEMP Reference
Minimise waste production	WMM 1	The 'waste hierarchy' (avoid/reuse/recycle/ resource recovery/disposal) will be maximised during construction; incorporated into work programs, purchase strategies and site inductions; and will be assessed quarterly to identify opportunities for improvement. Recycled materials will be used where feasible.	Pre-Construction Construction	Table 6-1
	WMM 2	Staff to be trained in waste reduction.	Pre-Construction Construction	Table 6-1
	GS5	A spoil management strategy will be identifying opportunities for re-using the material onsite and locations outside the Proposal for re-use or disposal. Re-use onsite will be the priority.	Pre-Construction Construction	Table 6-1 Construction Soil and Water Management Sub-Plan
Minimise energy consumption	CG1	Energy efficient work practices will be adopted to limit energy use. Where reasonable and feasible, equipment and management measures will be adopted to minimise energy use and greenhouse gas production. Minimise vegetation clearance where possible.	Pre-Construction Construction	Table 6-1 Construction Flora and Fauna Management Sub-Plan
Store and dispose of waste appropriately.	SGW 1	Bunded areas will be used for storage of oils, chemicals, toxic substances and combustible liquids, and for potentially hazardous and contaminating activities (e.g. washing construction vehicles, plant and equipment, handling and pouring hazardous materials and liquids etc).	Construction	Table 6-1
	SGW 2	Spills will be contained immediately and will be stored in bunded areas until disposal. Spills will be disposed of at a facility that is licensed to receive the waste, or may be disposed of after appropriate treatment.	Construction	Table 6-1
	WMM 3	A waste register to be developed during construction.	Construction	Table 6-1, Appendix C
	WMM	Any waste material that is unable to be re-used, reprocessed or recycled will be disposed	Construction	Table 6-1

Outcome	Ref #	Commitment	Timing	CWEMP Reference
	4	at a facility approved to receive that type of waste. Waste will be disposed at a facility licensed to accept that classification of waste.		

4 Environmental aspects and impacts

4.1 Construction waste streams and energy use

The following construction related waste streams have been identified:

- Demolition wastes from existing structures that require demolition, pipe work, pavements and concrete pathways.
- Excavation wastes.
- Concrete waste.
- Vegetation from removal of shrubs and trees.
- Packaging materials associated with items delivered to site such as pallets, crates, cartons, plastics and wrapping materials.
- Wastes produced from the maintenance of various heavy construction equipment including liquid hazardous wastes from cleaning, repairing and maintenance.
- Non-hazardous wastes would be generated through the use of worker's facilities such as toilets.
- General wastes including office wastes, scrap materials and biodegradable wastes.

The following sources of construction related energy consumption (fuel and power) have been identified:

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

4.2 Impacts

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

- Generation of construction waste, such as excavated soil and rock.
- 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.
- 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.
- Consumption of non-renewable resources such as energy, diesel and other chemicals.
- Greenhouse gas emissions due to consumption of energy from non-renewable resources.

5 Waste and energy management

5.1 Waste management register

A Waste Management Register shall be maintained which identifies all waste produced on site and subsequent management. The Register shall document the following:

- Type and quantity of waste.
- Whether the waste is to be recovered (either for use on-site or off-site) or sent for disposal.
- Tracking information of trackable waste streams.
- Upon removal of waste from site – date of removal, transport contractor information and final destination.

All relevant documentation such as dockets and receipts will be retained within the Register (Appendix C).

5.2 Classification of waste streams

Where waste cannot be avoided, reused or recycled it will be classified and appropriate disposal will then occur. The classification of waste is undertaken in accordance with the DECCW Waste Classification Guidelines Part 1: Classifying Waste (2009). This document identifies six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid (putrescible) and General Solid (non-putrescible), and describes a six step process to classifying waste. That process is described below:

Step 1: Is it 'special waste'?

Establish if the waste should be classified as special waste. Special wastes are: clinical and related, asbestos, waste tyres. Definitions are provided in the guidelines.

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 whether it is 'liquid waste'. Liquid waste means any waste that: has an angle of repose of less than 5° above horizontal becomes free-flowing at or below 60° Celsius or when it is transported 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 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 can include 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 needs to be chemically assessed to determine whether it is hazardous, restricted solid or general solid waste (putrescible and non-putrescible). If the waste is not chemically assessed, it must be treated as hazardous.

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

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 Waste exemptions

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. The EPA has issued general exemptions 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' may be applicable to this Project are defined in Table 5-1. 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 5-1 Resource recovery exemptions

Exemption	General Conditions
Effluent Exemption 2008	The effluent can only be applied to land for the purposes of irrigation or as a soil amendment material. The consumer must land apply the effluent within a reasonable period of time.
Excavated Natural Material Exemption 2008	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.
Excavated Public Road Material 2012	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.
Raw Mulch Exemption 2008	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.
Recovered Aggregate Exemption 2010	The chemical concentration or other attribute of the recovered aggregate listed in Recovered Aggregate Exemption must be met.

Exemption General Conditions

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:
 - a. the relevant waste is applied to land to the minimum extent necessary for the construction of a road, and
 - b. a development consent for the development has been granted under the relevant Environmental Planning Instrument (EPI), or
 - c. it is to provide access (temporary or permanent) to a development approved by a Council, or
 - d. the works undertaken are either exempt or complying development.

Additionally, the following conditions must be met by the consumer

- Records of the quantity of the recovered aggregate received by the consumer and the suppliers' name and address must be kept for a period of three years.
- The consumer must land apply the relevant waste within a reasonable period of time.

5.4 Classification of potential waste streams

The construction aspects and types of wastes, which may be generated during construction, are outlined with classifications in Table 5.2 (below).

Table 5-2 Classification of potential waste streams

Aspect	Waste Types	Classification	Proposed reuse/Recycling/Disposal
Demolition/Site Clearing	Vegetation (logs, mulched timber, weeds)	General solid waste (non-putrescible)	Recycling/Disposal
	Concrete, asphalt and gravel	General solid waste (non-putrescible)	Recycling/Disposal
	Scrap metal	General solid waste (non-putrescible)	Recycling/Disposal
Bulk Earthworks	ENM (Excavated Natural Material)	If material is taken off site classification will be carried out, based on soil tests carried out pre-construction and in accordance with the EPA <i>Waste Classification Guidelines: Parts 1 and 2</i> (DECC 2009)	Recycling
	Potentially Contaminated Soils		Disposal
Road Construction	Steel Reinforcing	General solid waste (non-putrescible)	Recycling/Disposal
	Conduits and pipes	General solid waste (non-putrescible)	Disposal
	Concrete (solids and washouts) and asphalt	General solid waste (non-putrescible)	Recycling/Disposal
	Timber formwork	General solid waste (non-putrescible)	Recycling/Disposal
	Packaging Materials, including wood, plastic,	General solid waste (non-putrescible)	Recycling/Disposal

Aspect	Waste Types	Classification	Proposed reuse/Recycling/Disposal
	cardboard and metals		
	Empty oil and other drums	General solid waste (non-putrescible)	Disposal
	Pesticides, herbicides, spill clean ups, paints and other chemicals	Hazardous waste	Disposal
	Metals and electrical cabling	General solid waste (non-putrescible)	Disposal
Compounds and Workshop Operation	Tyres	Special Waste	Special Waste
	Waste generated by the maintenance of equipment including air and oil filters and rags	General solid waste (non-putrescible)	Disposal
	Oils, grease, fuel, chemicals and other fluids	Liquid	Disposal
	Batteries	Hazardous waste	Disposal
	Radiator Fluid	Hazardous waste	Disposal
	Hydraulic Fluid	Hazardous waste	Disposal
	Domestic waste generated by workers	General solid waste (putrescible)	Disposal
	Sewage	General solid waste (putrescible)	Disposal
Office Operation	Paper, cardboard and plastic	General solid waste (non-putrescible)	Recycling
	Glass bottles and aluminium cans	General solid waste (non-putrescible)	Recycling
	Ink cartridges	General solid waste (non-putrescible)	Disposal/Recycling
	Food Waste	General solid waste (non-putrescible)	Disposal
	Effluent (eg STP)	Liquid	Disposal

5.5 Waste avoidance/reduction

According to the waste hierarchy, avoidance of waste should be of top preference. During the construction phase, the following measures will be implemented to avoid creation of waste:

- Renting of office equipment rather than purchase, where feasible.
- Ensuring that the necessary planning is undertaken to enable efficient management of the delivery and storage of materials (including a “just-in-time” strategy), so as to avoid spoilage of materials.
- Establishing agreements with suppliers for “take back” arrangements for packaging/pallets/drums, where possible.
- Highlighting the minimisation of packaging as an important factor in the product procurement process.

- Ensuring correct types and quantities of materials are ordered.
- Coordinating site activities to minimise waste.
- Ensuring site personnel use plant and equipment correctly to minimise parts replacement.

5.6 Reuse and recycling

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 onsite – Waste materials, including spoil and demolition waste, will be separated onsite into dedicated bins/areas for either reuse onsite or collection by a waste contractor and transport to offsite facilities.

Waste separation offsite – Wastes to be deposited into one bin where space is not available for placement of multiple bins, and the waste is to be sorted offsite by a waste contractor.

5.7 Waste Handling and Storage

Where waste is required to be handled and stored onsite prior to onsite reuse or offsite recycling/disposal, the following measures apply:

- Spoil, topsoil and mulch are to be stockpiled onsite in allocated areas, where appropriate, and mitigation measures for dust control and surface water management will be implemented as per the Construction Air Quality Management Sub-Plan and the Construction Soil and Water Management Sub-Plan.
- Liquid wastes are to be stored in appropriate containers in bunded areas until transported offsite. Bunded areas will have the capacity to hold 110 per cent of the liquid waste volume for bulk storage or 120 per cent 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 the EPA waste disposal guidelines.
- All other recyclable or non-recyclable wastes are to be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations onsite and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

5.8 Waste Disposal

Waste (and spoil) disposal is to be in accordance with the *Protection of the Environment Operations Act 1997* and the *Waste Avoidance and Resource Recovery Act 2001*. Wastes that are unable to be reused or recycled will be disposed of offsite to an EPA approved waste management facility following classification (refer to section 5.2). The location of waste management/disposal facilities are included in (Appendix A and B). Details of waste types, volumes and destinations are to be recorded in the Waste Management Register (Appendix C).

5.9 Energy Conservation

The Project Team is dedicated to implementing energy conservation best practice and the reduction of greenhouse gases by adopting energy efficient work practices including:

- Developing and implementing procedures to minimise energy use.
- Conducting awareness programs for all site personnel regarding energy conservation methods.

6 Environmental Mitigation and Management

A range of environmental requirements are identified in the various environmental documents, including the EA, Statement of Commitments (refer to Table 3-2 above), Conditions of Approval (refer to Table 3-1 above) and Roads and Maritime documents, and from industry best practice. Specific measures and requirements to address waste management and energy use issues are outlined in Table 6-1.

Table 6-1 Management and mitigation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference
GENERAL				
WR1	The NSW Government's Waste Management Hierarchy of "avoid-reuse-reprocess-recycle-energy recovery-dispose" will be followed as the framework of waste management throughout the project.	Pre-construction Construction	PM ESR	WARR Act EA SoC WMM1
WR2	Waste management measures from this CWEMP will be included in relevant Environmental Work Method Statements to be developed prior to the commencement of specific activities	Pre-construction Construction	Site Engineer ESR	EA WMM1 CoA B30 (e) (v)
WR3	All staff and subcontractors will undergo a site induction and ongoing toolbox talks that will detail waste minimisation and reuse management measures, including the requirements of the waste management hierarchy. Waste minimisation training will include energy consumption awareness that promotes energy conservation methods including minimising energy use by switching off equipment when not in use.	Pre-construction Construction	ESR Site Engineer Supervisors	EA SoC WMM2
WR4	Procurement of materials will be planned and managed to avoid the over-ordering of products and to minimise excess packaging.	Construction	Site Engineer	SoC WMM1
WR5	All waste will be classified and disposed of in accordance with the DECCW "Waste Classification Guidelines".	Construction	PM ESR Site Engineer Supervisors	C26 CoA B30 (e) (v) SoC WMM4
WR6	Recycled material will be considered for use in all aspects of the project where feasible and reasonable in accordance with the NSW Government's Waste Reduction and Purchasing Policy.	Construction	Site Engineer	EA SoC WMM1 CoA B30 (e) (v)

ID	Measure/Requirement	When to implement	Responsibility	Reference
WR7	<p>Cleared vegetation will be reused or recycled to the greatest extent practicable for example:</p> <ul style="list-style-type: none"> Mulching of vegetation for use in landscaping; Spreading of vegetation for fauna habitat in suitable areas where agreements are made for this (e.g. mulch, small timber, hollow logs); Donation of other timber to community or environmental groups. 	Construction	ESR Site Engineer	CoA B30 (e) (v) SoC WMM1
WR8	Weeds will be managed, handled and disposed of in accordance with the Weed Management Strategy (see the Construction Flora and Fauna Management Sub-Plan). If disposal is appropriate, the weed material will be transferred to a licensed waste facility.	Construction	Site Engineer	SoC F8
WR9	The reuse and/or recycling on site of waste materials generated on site (such as VENM, concrete, asphalt, bricks/masonry and steel products) will be maximised as far as practicable. Alternatively they will be sent off site for recycling.	Construction	Site Engineer	EA CoA C25 CoA GS5 CoA B30 (e) (v) SoC WMM1
WR10	Sediment recovered from erosion and sediment control devices will be reused on site as general fill material or it will be incorporated within landscaping materials where possible.	Construction	Site Engineer	SoC WMM1 CoA C25
WASTEWATER				
WR11	Stormwater (e.g. from sediment control basins) and other recycled water will be used in construction activities, where possible and of appropriate quality.	Construction	Site Engineer Supervisors	CoA B30 (e) (v) SoC WMM1
HANDLING AND STORAGE				
WR12	Storage and handling of waste will be conducted in compliance with the requirements of the <i>PoEO Act</i> and <i>PoEO (Waste) Regulation</i> .	Pre-Construction Construction	PM ESR	<i>PoEO Act</i> EA CoA C24

ID	Measure/Requirement	When to implement	Responsibility	Reference
WR13	Oils and other hazardous liquids will be labelled and stored in a sealed container within a bunded area. Material collected from within bunded areas will be disposed off site at a waste facility approved by the EPA.	Construction	Site Engineer/ESR	QA Spec G36 CoA B30 (e) (v) CoA C26 CoA C27 SoC SGW1 SoC SGW2 SoC WMM4
WR14	Waste generated outside the site will not be received on site unless a relevant licence is held.	Construction	PM ESR	CoA C24
WR15	Dangerous goods will be stored and handled in accordance with their Material Safety Data Sheet.	Construction	PM ESR Site Engineer Supervisors	CoA C27
WR16	Regular visual inspections will be conducted to ensure work sites are tidy and to identify opportunities for reuse/recycling.	Construction	ESR/Supervisors Site Engineer	EA
WR17	Bunded areas are to be used for storage of oils, chemicals, toxic substances and combustible liquids, and for potentially hazardous and contaminating activities (e.g. washing construction vehicles, plant and equipment, handling and pouring hazardous materials and liquids etc).	Construction	ESR/Supervisors Site Engineer	SoC SGW1 CoA C27
WR18	Spills will be contained immediately and will be stored in bunded areas until disposal. Waste will be classified and disposed of in accordance with the DECCW "Waste Classification Guidelines" and disposed of at a facility that is licensed to receive the waste.	Construction	ESR Site Engineer Supervisors	SoC SGW2 CoA C26 CoA C27
WR19	Containers for litter and other wastes are to be provided, with contents disposed of on a regular basis.	Construction	Site Engineer Supervisors	EA

WASTE DISPOSAL

ID	Measure/Requirement	When to implement	Responsibility	Reference
WR20	A Waste Management Register (refer to Appendix C) of all waste collected for disposal and/or recycling will be maintained on a monthly basis until final completion.	Pre-Construction Construction	PM ESR	<i>PoEO Act</i> EA SoC WMM3
WR21	Waste will be managed and disposed of in accordance with the PoEO Act and the WRAPP. Wastes that are unable to be reused or recycled will be disposed of offsite at a licensed waste management facility, following classification.	Construction	ESR	QA Spec G36 SoC WMM4
WR22	A s143 notice under the PoEO Act will be completed should the off site (on private property) disposal of road construction waste material or VENM be deemed necessary.	Construction	Site Engineer/ESR	PoEO Act QA Spec G36
WR23	The relevant licenses of waste facilities utilised for the disposal of project waste will be obtained (on a regular basis if necessary) to ensure they are legally able to accept that waste.	Construction	ESR	QA Spec G36
WR24	The disposal of chemical, fuel and lubricant containers, solid and liquid wastes must be in accordance with the requirements of the local Council or the EPA.	Construction	Site Engineer/ESR	QA Spec G36 CoA C26 CoA C27 SoC WMM4
WR25	All trucks transporting wastes off site will be appropriately licensed to carry the materials to appropriately licensed waste facilities.	Construction	Site Engineer	QA Spec G36 SoC WMM4
WR26	Waste will be disposed at a facility licensed to accept the waste.	Construction	ESR Site Engineer Supervisors	CoA C26 CoA WMM4 SoC SGW2
ENERGY CONSERVATION				
WR27	Energy efficient work practices will be implemented, including the consideration of: <ul style="list-style-type: none"> Energy efficient design of site buildings; Design of site construction work sites to minimise unnecessary vehicle movement; Regular servicing off site plant and equipment; 	Pre-Construction Construction	PM ESR Site Engineer	Best practice EA SoC CG1

ID	Measure/Requirement	When to implement	Responsibility	Reference
	<ul style="list-style-type: none"> • Training of personnel in energy efficient best practices; • Use of biofuels in plant and equipment where reasonable and feasible; • Fuel and energy efficiency when selecting plant and equipment; and • Use of locally sourced material where available and of suitable quality. 		Supervisors	

7 Compliance management

7.1 Roles and responsibilities

The FAA's organisational structure and overall roles and responsibilities are outlined in Section 4.2 of the CEMP. Specific responsibilities for the implementation of environmental controls relating to waste and energy management are detailed in Chapter 6 of this Plan.

7.2 Training

All employees, contractors and utility staff working on site will undergo site induction training relating to waste and energy management issues. The induction training will address elements including:

- Existence and requirements of this Plan.
- Relevant legislation.
- Incident response, management and reporting.
- Waste reporting requirements.
- Requirements of the waste hierarchy.
- Waste/ recycle storage requirements.
- Energy efficient best practices.
- Other specific responsibilities for waste and reuse management.

Further details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

7.3 Monitoring and inspection

Regular monitoring and inspections will be undertaken during construction.

On a monthly basis the ESR will review the Waste Management Register (Appendix C of this CWEMP) to verify that proposed targets included in Table 2-1 Construction Waste Streams targets are being achieved. Any significant deviations shall be reported to the Q & E Manager for review to ensure waste is being accurately reported and disposed/recycled etc correctly.

Additional requirements and responsibilities in relation to inspections are documented in Section 8 of the CEMP.

7.4 Auditing

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

Audit requirements are detailed in Section 8 of the CEMP.

7.5 Reporting

Reporting requirements and responsibilities are documented in Section 8.5 of the CEMP.

8 Review and improvement

8.1 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.
- 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.

8.2 CWEMP plan update and amendment

The processes described in Chapters 9 and 10 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the CWEMP will be in accordance with the process outlined in Section 1.6 of the CEMP.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 10 of the CEMP.

Appendix A

Waste contact list

Table A-1 Waste Contact List

Company Name	Waste Type	Contact Details
JR Richards & Sons	<ul style="list-style-type: none"> • Green Waste • Scrap Metal • Empty containers used for herbicides and other hazardous chemicals • Recyclables • Asbestos • Spills • Contaminated soil • Waste oil • Hazardous waste 	92-94 Manning Street, Tuncurry NSW 2428 Phone: 02 65557007 - Fax: 02 65557888
Veolia	<ul style="list-style-type: none"> • Wastewater 	13 29 55
Veolia	<ul style="list-style-type: none"> • Waste Fuel and Oil 	13 29 55
Cairncross Waste Management Facility	<ul style="list-style-type: none"> • General Waste • Green waste • Recyclables 	8395 Pacific Highway, Telegraph Point 02 6585 0738

Appendix B

Location of waste facilities

Table A-2 Location of waste facilities

Company Name	Location
JR Richards	94 Manning Street, Tuncurry NSW 2428 Phone: 02 65557007 - Fax: 02 65557888
Veolia	41 Martin Dr, Tomago NSW 2322
Veolia	41 Martin Dr, Tomago NSW 2322
Cairncross Waste Management Facility	8395 Pacific Highway, Telegraph Point 02 6585 0738
Port Macquarie Waste Management Facility Managed by JR Richards- Waste Transfer station	Kingfisher Road (off Oxley Highway), Port Macquarie

Appendix C

Waste management register

