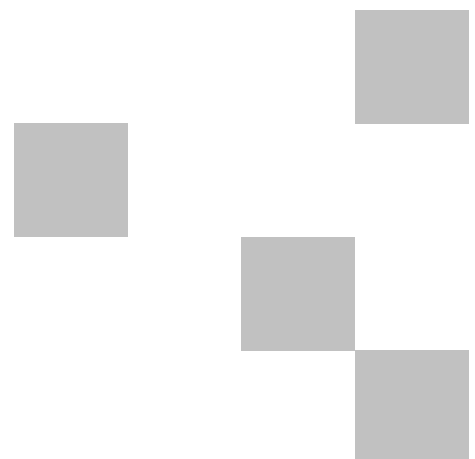




# **APPENDIX B7**

## **Construction Waste and Energy Management Plan Woolgoolga to Halfway Creek**

**MAY 2015**



## Document control

File name	Appendix B7_WEMP_W2HC_180515.doc
Report name	W2HC Construction Waste and Energy Management Plan
Revision number	05

Plan approved by:



Contractor PM





Contractor EM



Authorised Delegate

## Revision history

Revision	Date	Description	Approval
01	27/02/15	Issued to RMS for review	
02	11/02/15	Issued to Agencies for comment	
03	25/02/15	Issued to RMS for final review	
04	13/03/15	Issued to RMS for submission to Department of Planning	
05	18/05/2015	Incorporation of DoP comments	

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## **Appendices**

- Appendix A** *Waste contact list*
- Appendix B** *Location of waste facilities*
- Appendix C** *Surplus material management plan*
- Appendix D** *Example waste management register*

## Glossary / Abbreviations

CEMP	Construction Environmental Management Plan
CoA	Condition of Approval
DECC	Former Department of Environment and Climate Change (NSW) now NSW Office of Environment and Heritage.
DGB	Dense Grade Base
DGS	Dense Grade Sub Base
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EPL	NSW Environment Protection Licence under the <i>Protection of the Environment Operations Act 1997</i> .
ESCP	Erosion & Sediment Control Plan
EWMS	Environmental Work Method Statements
FM Act	<i>Fisheries Management Act 1994</i>
Minister, the	NSW Minister for Planning
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
OHLY	OHL York Joint Venture
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>
Project, the	Woolgoolga to Halfway Creek
RMS, Roads and Maritime Services	Roads and Maritime
Secretary	Secretary of the Department of Planning and Environment
SPIR	Woolgoolga to Ballina Pacific Highway Upgrade Submissions Preferred Infrastructure Report (November, 2013)
VENM	Virgin Excavated Natural Material
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WEMP	Construction Waste and Energy Management Plan
WRAPP	Waste Reduction and Purchasing Policy
W2HC	Woolgoolga to Halfway Creek

# 1 Introduction

## 1.1 Context

This Construction Waste and Energy Management Plan (WEMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for Construction of the Woolgoolga to Halfway Creek Pacific Highway Upgrade (the Project). A description of this section is included in the CEMP.

This WEMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the mitigation measures listed in the *Pacific Highway Upgrade: Woolgoolga to Ballina Environmental Impact Statement December 2012* (the EIS), the *Submissions / Preferred Infrastructure Report November 2013* (SPIR) and all applicable legislation.

There is one tie in project within the Woolgoolga to Halfway Creek project limit, namely the Sapphire to Woolgoolga Project. This tie in project has been approved separately by the Department of Planning and Environment. Relevant conditions of approval for this project have been referenced in the Woolgoolga to Ballina CEMP and plans as appropriate

## 1.2 Background

The EIS assessed the impacts of construction in terms of waste generation/management and resource use, within chapter 18.3. Greenhouse gas emissions and energy issues were assessed in the EIS in chapter 18.1.

The EIS identified the various waste streams that will be generated during the construction of the Project, including construction and demolition waste, vegetation waste, packaging materials and liquid wastes. It also identified opportunities to avoid, reduce and recycle waste.

The EIS identified potential impacts in regards to greenhouse gas emissions. Measures to help address greenhouse gas emissions in construction were identified.

Additional management measures were provided within the SPIR, with applicable management measures from that report included as part of this WEMP.

## 1.3 Environmental management systems overview

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

The WEMP is part of the OHL York Joint Venture (OHLY) environmental management framework for the Project, as described in Section 4.1 of the CEMP. Management measures identified in this Plan will be incorporated into site or activity specific Environmental Work Method Statements (EWMS).

EWMS will be developed in accordance with G36, and signed off by OHLY 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 OHLY personnel and contractors.

The review and document control processes for this Plan are described in Section 10 of the CEMP.

## 2 Purpose and objectives

### 2.1 Purpose

The purpose of this Plan is to describe how OHLY proposes to minimise the amount of waste for disposal, manage waste and reduce energy consumption during construction of the Project.

### 2.2 Objectives

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

- Ensure measures are identified and implemented to minimise waste, 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 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 outlined in Table 3.1 and Table 3.2, and the mitigation measures detailed in the EIS.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Plan.
- Promote sustainable resource use by maximising the reuse of waste materials onsite, and educating site personnel and subcontractors on the types of waste streams and sources of wastes.

### 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.
- Dispose of waste materials in accordance with legislative requirements.
- Minimise / reduce the quantities of resources to be used.
- Where possible, 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	Disposal methods	Reuse / Recycle Target
Demolition	Concrete & asphalt	General solid waste (non-putrescible)	12000m <sup>3</sup>	Crush & reuse suitable material as road base. Send offsite for recycling	50%
	Timber	General solid waste (putrescible)	500m <sup>3</sup>	Merchantable timber if accepted by Forest NSW	100%
	Scrap metal	General solid waste (non-putrescible)	200 tonne	Send offsite for recycling	90%

Construction Activity	Waste Type	Waste Classification	Likely quantity	Disposal methods	Reuse / Recycle Target
Excavation	Rock	Virgin Excavated Natural Material (VENM)	25,000m <sup>3</sup>	Crush rock to use as select fill material or for other applications. Reuse on other RMS projects.	90%
	Soil	Virgin Excavated Natural Material (VENM)	25,000m <sup>3</sup>	Soil will be reused on site wherever possible Reused on other RMS projects Sent offsite for recycling and reuse	90%
Vegetation clearance	Vegetation	General solid waste (putrescible) or green waste	108 000m <sup>3</sup>	Mulching and reuse as compost, ground cover or soil conditioner. Surplus mulch material to be offered to local farms or Broadwater Cogeneration Plant.	90%
Construction	Metals	General solid waste (non-putrescible)	100 tonne	Send offsite for recycling	95%
	Concrete	General solid waste (non-putrescible)	1000 tonne	Crush and reuse onsite as road base or hardstand areas	80%
	Plastics	General solid waste (non-putrescible)	50m <sup>3</sup>	Send offsite for recycling	25%
	Packaging material	General solid waste (non-putrescible)	50m <sup>3</sup>	Send offsite for recycling	60%
	Oil, grease, fuel	Liquid	2000 litres	Send offsite for recycling at approved facility	100%
	Oil filters, rags and oil absorbent materials	General solid waste (non-putrescible)	30m <sup>3</sup>	Send offsite to approved facility	20%
	Batteries & Chemicals	Hazardous waste	>1m <sup>3</sup>	Dispose of as hazardous waste	100%
	Tyres	Special waste	500m <sup>3</sup>	Recycled where possible	70%



## 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 2014.
- *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, specifications and policy documents relevant to this Plan include:

- Waste Classification Guidelines (EPA 2009)
- Waste Reduction and Purchasing Policy 2011-2014 (WRAPP), NSW Government
- Best Practice Waste Reduction Guidelines for the Construction and Demolition Industry (tools for Practice), Natural Heritage Trust, 2000.
- RMS Waste Fact Sheets: Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), Excavated Public Road Materials, Recovered Aggregates, Asbestos Waste, and Waste Sampling.
- Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000).
- Guidelines on Resource Recovery Exemptions - Land Application of Waste Materials as Fill (2011, DECCW).
- Guidelines on Resource Recovery Exemptions (Land Application of Waste Materials as Fertiliser or Soil Amendment) (2011, DECCW).
- Stockpile Site Management Guideline, RMS 2011.

## 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 WEMP**

CoA No.	Condition Requirements	Document Reference
B68.	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the <i>Protection of the Environment Operations Act 1997</i> , if such a licence is required in relation to that waste.	Chapter 6
B69.	The reuse and/or recycling of waste materials generated on site shall be maximised as far as practicable, to minimise the need for treatment or disposal of those materials off site.	Chapter 6
B70.	All liquid and/or non-liquid waste generated on the site shall be assessed and classified in accordance with <i>Waste Classification Guidelines</i> (Department of Environment, Climate Change and Water, 2009)	Chapter 6
B71.	All waste materials removed from the site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	Chapter 6
D25(viii)	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 or dealing with green waste including timber and mulch from clearing activities; and measures for reducing demand on water resources (including potential for reuse of treated water from sediment control basins);	Appendix D Section 5 Appendix D of SWMP Appendix G of SWMP Appendix C

## 4 Environmental aspects and impacts

### 4.1 Construction waste streams and energy use

The following construction related waste streams have been identified:

- Excavation wastes
- Timber and green wastes
- Demolition wastes
- Construction wastes including:
  - Wastes generated from concrete or asphalt batching plants.
  - Waste generated from chemical/spill clean-up or remediation.
  - Waste generated from remediation of contaminated material.
  - Waste generated from acid sulfate soil treatment.
  - Sediment/sludge from sediment basin desilting.
  - Waste water from tannin affected water, contaminated runoff from concrete bridge decks, water captured in excavations; and dam de-watering.
- Packaging materials.
- Waste produced from the maintenance of construction vehicles and plant, which might include oils, fluids, fuels, tyres.
- Sewage and general waste from construction compounds.
- Waste from litter and cigarette butts specifically around structures and crib sheds.
- Miscellaneous wastes.
- General waste from office and compounds.

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

- Procurement and delivery of materials to site.
- Vegetation removal.
- 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.
- 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 large volumes of excavated materials
- Weed infestation from dispersion of seeds and so forth during clearing and access upgrading activities.
- 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.
- 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 onsite, with the potential for misclassification
- Water pollution
- Land contamination.

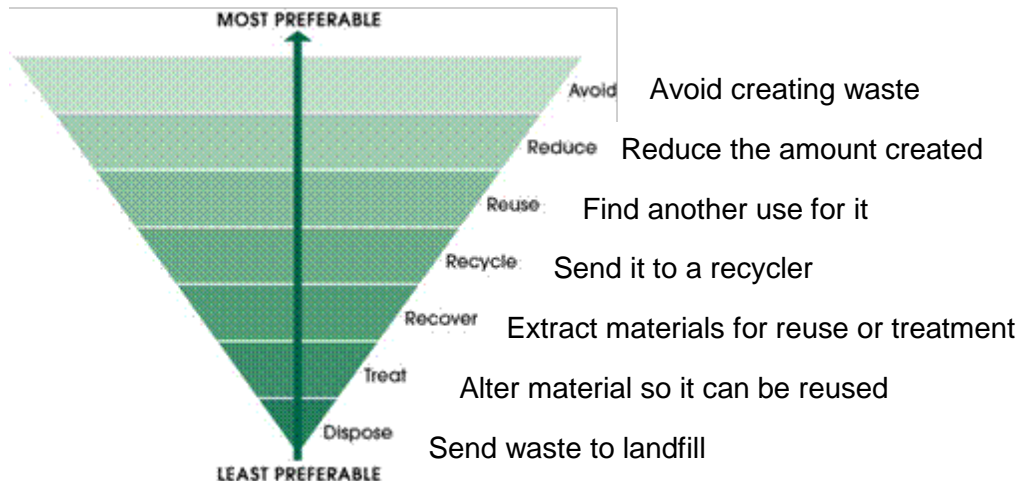
Earthworks would potentially generate the greatest amount of waste. To ensure the amount of waste is minimised, the construction contractor would manage earthworks requirements across the entire project, with construction staging taking into account efficient resource use and opportunities for reusing materials to limit waste generation. Roads and Maritime would also investigate whether unused resources could be used on other Pacific Highway projects.

A full list of management measures are included in Section 3 of this CEMP.

# 5 Waste and energy management

## 5.1 Classification of waste streams

Where waste cannot be avoided, reused or recycled (as per Figure 5.1, it will be classified and appropriate disposal will then occur).



**Figure 5.1 Waste Hierarchy**

The classification of waste is undertaken in accordance with the OEH *Waste Classification Guidelines Part 1: Classifying Waste* (2008). 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 2009.*

### 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 2014 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 includes items such as explosives, flammable solids, and 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).

## **5.2 Waste exemptions**

Clause 51 Protection of the Environment Operations (Waste) Regulation 2014 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 3-1 below. 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**

<b>Exemption</b>	<b>General Conditions</b>
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.
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

Exemption	General Conditions
Excavated Public Road Material 2014	<p>The excavated public road material can only be stored within the road corridor at the site where it is to be applied to land.</p> <p>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.</p> <p>The excavated public road material cannot be applied on private land.</p> <p>The consumer must apply the relevant waste within a reasonable period of time.</p>
Raw Mulch Exemption 2014	<p>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.</p> <p>The consumer must apply the raw mulch within a reasonable period of time.</p>
Recovered Aggregate Exemption 2014	<p>The chemical concentration or other attribute of the recovered aggregate listed in Recovered aggregate Exemption must be met.</p> <p>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:</p> <ul style="list-style-type: none"> <li>- Construction of dams or related water storage infrastructure,</li> <li>- Mine site rehabilitation,</li> <li>- Quarry rehabilitation,</li> <li>- Sand dredge pond rehabilitation,</li> <li>- Back-filling of quarry voids,</li> <li>- Raising or reshaping of land used for agricultural purposes, and</li> <li>- Construction of roads on private land unless: <ul style="list-style-type: none"> <li>a. the relevant waste is applied to land to the minimum extent necessary for the construction of a road, and</li> <li>b. a development consent for the development has been granted under the relevant Environmental Planning Instrument (EPI), or</li> <li>c. it is to provide access (temporary or permanent) to a development approved by a Council, or</li> <li>d. the works undertaken are either exempt or complying</li> <li>e. development.</li> </ul> </li> </ul>
Treated Drilling Mud Exemption 2014	<p>The chemical concentration or other attribute of the treated drilling mud listed in Column 1 of Table 2 must not exceed any of the following:</p> <ul style="list-style-type: none"> <li>- the absolute maximum concentration or other value listed in Column 3 of Table 2 of the exemption, and</li> <li>- the maximum average (based on the arithmetic mean) concentration or other value listed in Column 2 of Table 2 of the exemption.</li> </ul> <p>The treated drilling mud can only be applied to land as engineering fill or used in earthworks.</p>

### 5.3 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.

**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)	Beneficial reuse on site where possible. Beneficial reuse offsite. Green waste to be diverted from landfill
	Structures demolition waste	General solid waste (non-putrescible)	Effective source separation to enable reuse / recycling to be undertaken offsite.
	Concrete, asphalt and gravel	General solid waste (non-putrescible)	Reuse onsite (hardstands)
	Scrap metal	General solid waste (non-putrescible)	Recycling
	Hazardous and contaminated waste	Hazardous waste	Offsite disposal at an approved facility
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 2008). Refer to G36 4.11.2.	Beneficial reuse onsite (such as noise mounds). Balance cut and fill earthworks, where possible, to optimise reuse.
	Potentially Contaminated Soils		
	VENM (Virgin Excavated Natural Material)		Offsite disposal at an approved facility
Road Construction	Steel Reinforcing	General solid waste (non-putrescible)	Offsite recycling
	Conduits and pipes	General solid waste (non-putrescible)	Offsite recycling
	Concrete (solids and washouts) and asphalt	General solid waste (non-putrescible)	Crushed and used as backfill or as roadbase Sent offsite for recycling
	Timber formwork	General solid waste (non-putrescible)	Reuse onsite where possible or offsite for recycling
	Packaging Materials, including wood, plastic, cardboard and metals	General solid waste (non-putrescible)	Recycling offsite
	Empty oil and other drums	General solid waste (non-putrescible)	Offsite disposal at an approved facility. Return to supplier where possible
	Pesticides, herbicides, spill clean ups, paints and other chemicals	Hazardous waste	Offsite disposal at an approved facility
	Metals and electrical cabling	General solid waste (non-putrescible)	Offsite disposal at an approved facility



<b>Compounds and Workshop Operation</b>	Tyres	Special Waste	Reuse and recycling where possible. Offsite disposal at an approved facility	
	Waste generated by the maintenance of equipment including air and oil filters and rags	General solid waste (non-putrescible)	Offsite disposal at an approved facility	
	Oils, grease, fuel, chemicals and other fluids	Liquid	Offsite disposal at an approved facility	
	Batteries	Hazardous waste	Offsite disposal at an approved facility	
	Radiator Fluid	Hazardous waste	Offsite disposal at an approved facility	
	Hydraulic Fluid	Hazardous waste	Offsite disposal at an approved facility	
	Domestic waste generated by workers	General solid waste (putrescible)	Offsite disposal at an approved facility	
Office Operation	Sewage	General solid waste (putrescible)	Black water treatment or trade waste agreement	
	Paper, cardboard and plastic	General solid waste (non-putrescible)	Recycling offsite	
	Glass bottles and aluminium cans	General solid waste (non-putrescible)	Recycling offsite	
	Ink cartridges	General solid waste (non-putrescible)	Recycling offsite	
	Food Waste	General solid waste (non-putrescible)	Offsite disposal at an approved facility	
	Effluent (eg STP)	Liquid	Treated and/or reused onsite.	
			Offsite disposal at an approved facility.	

## 5.4 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.

Water reuse onsite – water generated from sediment basins will be reused onsite for construction and dust suppression, or discharged as per the EPL requirements.

Where sections of the existing Pacific Highway or local roads are excavated, the re-use of this material will be done in accordance with the conditions attached to the general resource recovery exemption, Excavated Public Road Material Exemption 2014 (EPA, 2014). Where this material has not been subjected to potentially contaminating sources, it can be reused within the road corridor without further testing or any specific licensing requirements. Where this material is suspected of being subject to contamination (e.g section of road is adjacent to a service station, or an old sheep dip), testing and classification of this material will be undertaken.

Secondary waste material would be used in construction wherever feasible and reasonable. Where materials cannot be reused and recycled, all waste would be handled and disposed in accordance with the *Protection of the Environment Operations Act 1997*.

Roads and Maritime would also investigate whether unused resources could be used on other Pacific Highway projects.

## 5.5 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 Air Quality Management Plan and the Soil and Water Management Plan, including the Stockpile Management Protocol.
- 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*, EPA waste disposal guidelines and G36 Section 4.11.
- 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.
- It is estimated that mulching of timber and green wastes for the project will generate significant quantities of mulch. Mulch has the potential of creating tannin affected water, which in turn has the potential of causing water pollution. Mulch stockpiles are to be managed in accordance with the Soil and Water Management Plan.

## 5.6 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 5.1*). The location of waste management / disposal facilities are included in Appendix B. Details of waste types, volumes and destinations are to be recorded in the Waste Management Register (Appendix D).

Where possible wastes will be removed off-site by a licenced transporter to a recycling facility or will be disposed of at a licensed waste facility.

## 5.7 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 through the project induction, toolboxes and ongoing environmental awareness training.

## **6 Environmental mitigation and management measures**

A range of environmental requirements are identified in the various environmental documents, including the EIS, Submissions / Preferred Infrastructure Report,, Statement of Commitments, supplementary assessments, Conditions of Approval and Roads and Maritime documents, and from recent experience on similar road projects. Specific measures and requirements to address waste management and energy use issues are outlined in Table 6-1.

The responsibilities of the roles identified in Table 6-1 are detailed in Section 4.2 of the CEMP.

**Table 6-1 Management and mitigation measures**

ID	Measure / Requirement	When to implement	Responsibility	Reference
<b>GENERAL</b>				
WE1	The NSW Governments Waste Management Hierarchy of “avoid-reduce-reuse- recycle- dispose” will be followed as the framework of waste management throughout the project.  The reuse and/or recycling of waste materials generated on site shall be maximised as far as practicable, to minimise the need for treatment or disposal of those materials off site.	Pre-construction Construction	Construction Manager / Environment Manager	G36 CoA B69
WE2	Waste management measures from this WEMP will be included in relevant Environmental Work Method Statements to be developed prior to the commencement of specific activities	Pre-construction / Construction	Site Engineer / Environmental Officer	Good practice
WE3	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.	Construction	Environment Manager / Foreman	Good Practice Site Induction Toolbox Talks G36 3.5
WE4	Procurement of materials will be planned and managed to avoid the over-ordering of products and minimise excess packaging is to be carried out.	Construction Pre-Construction	Site Engineer / Foreman	Good Practice
WE6	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	G36
WE7	Weeds will be managed, handled and disposed of in accordance to The Weed Management Strategy (refer to the FFMP). If disposal is appropriate, the weed material will be transferred to a licensed waste facility.	Construction	Foreman	Good practice Weed Management Plan (FFMP)
WE8	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 and stabilised.	Construction	Foreman	Good Practice SWMP ERSED Plans G38 3.7.5

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE9	The cut and fill balance of the project will be further refined to obtain as much material as possible for re-use on the project.	Pre-construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM1)
WE10	<p>A resource use management strategy will be prepared for construction of the project and identify the hierarchy for sourcing and use of resources.</p> <p>This will include:</p> <ul style="list-style-type: none"> <li>- Available project cutting material (including SMZ and verge material) will be used for the construction of the embankments, SMZ and verge within that section to the extent that it is suitable.</li> <li>- Project sections with a deficit in material will import surplus material from other project sections in preference to external sources.</li> <li>- Where possible, the distances that earthworks materials are moved across the project as a whole will be minimised, notwithstanding the above two requirements.</li> <li>- Any unsuitable material will be used for landscaping or disposed of within each project section, either for batter flattening or noise mounds or placed in stockpile.</li> <li>- Contractors will reduce the amount of unsuitable waste generated during excavations, where feasible (eg treatment at source)</li> <li>- Other locations of disposal of unsuitable material will be considered including borrow source areas created as part of the project</li> <li>- The generation and management of unsuitable material during project earthworks will be monitored to ensure appropriate management of the issue</li> </ul>	Pre-construction and construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM2)
WE11	<p>Resource use management strategy should also identify:</p> <ul style="list-style-type: none"> <li>- Details on materials that will be sourced from the project (including location and type).</li> <li>- Viable material suppliers (including water) near the project.</li> <li>- Proposed sustainable material sources practices (such as recycled materials or use of waste water).</li> <li>- Materials that could be recycled and re-used on-site or transferred to other project sections.</li> </ul>	Pre-construction and construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM3)
WE12	Where possible, materials will be bought in bulk to minimise the amount of package required. Sources of material that have sustainable packaging design, recycled and recyclable packaging will be favoured over other material sources where cost effective.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM4)

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE13	All waste material generated on-site will be dealt with in accordance with the <i>Protection of the Environment Operations Act 1997</i> and <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (DECCW, 2009), or any superseding document. Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the <i>Protection of the Environment Operations Act 1997</i> , if such a licence is required in relation to that waste.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM5) CoA B68, CoA B70
WE14	Waste minimisation and management measures will be developed based on the principles in the <i>Waste Avoidance and Resource Recovery Act 2001</i> , the NSW Government's <i>Waste Reduction and Purchasing Policy</i> , and waste exemptions including: - Excavated Natural Material Exemption (EPA, 2014)). - Excavated Public Road Material Exemption (EPA, 2014)) - Raw Mulch Exemption (EPA, 2014) - Reclaimed Asphalt Pavement Exemption (EPA, 2014) - Recovered Aggregate Exemption (EPA, 2014) - Stormwater Exemption (EPA, 2014) - Treated Drilling Mud Exemption (EPA, 2014) - Measures will seek to avoid, minimise, re-use, recycle, treat or dispose of waste streams during construction and address transport and disposal arrangements.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM6)
WE16	Millable timber will be harvested for reuse off site. All other felled timber will be reused on-site in the form of habitat recreation or mulch in landscaping and erosion and sedimentation controls. Where mulch cannot be reused on-site, consideration will be given to making the mulch available to the public in accordance with the <i>RMS Environmental Direction 25 (2012)</i> and the <i>Raw Mulch Exemption (EPA, 2014)</i> .	Construction	Foreman / Environment Officer	W2B Submissions / PIR (WM7)
WE17	Sediment removed from sedimentation basins will, where appropriate, be used on-site in landscaping and/or flattening of batters.	Construction	Foreman / Environment Officer	W2B Submissions / PIR (WM8)
WE18	Where feasible, the contractor will be required to re-use materials. This could include, but is not limited to concrete formwork or surplus concrete pours.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM9)
WE19	Site inductions on waste minimisation principles and measures will be developed.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM10)

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE20	At site compounds, on-site recycling facilities will be provided for recycling paper, plastic, glass and other re-useable materials.	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM11)
WE21	Regular visual inspections will be conducted to ensure that work sites are kept tidy and to identify opportunities for reuse and recycling.	Construction	Foreman / Environment Officer	W2B Submissions / PIR (WM12)
WE22	Water captured in excavations will be required to be either: - Managed in accordance with the construction Soil and Water Management Plan - Transferred to a licensed sediment basin, treated and discharged in accordance with any licence conditions that apply to the discharge of water, or - Re-used for construction water or dust suppression	Construction	Construction Manager / Environment Manager	W2B Submissions / PIR (WM13)
WE22	Topsoil (weed free) will be stockpiled in accordance with RMS criteria in allocated areas and reused for landscaping.	Construction	Foreman / Environmental Officers	G36
WE23	Any contaminated waste will be handled, separated, contained, managed and disposed of to prevent migration and further contamination.	Construction	Foreman	CLM Act G36
<b>WASTE DISPOSAL</b>				
WE24	A waste register will be maintained, detailing types of waste collected, amounts, date/time and details of disposal.	Construction	Environment Manager / Environment Officer	W2B Submissions / PIR (WM3)
WE25	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, or premises lawfully permitted to accept the materials following classification.	Construction	Environment Manager / Environment Officer	G36 CoA B71
WE26	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	Foreman / Environment Officer	G36
WE27	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	Foreman / Environment Officer	PoEO Act G36
WE28	The relevant licences of waste facilities utilised for the disposal of project waste will be obtained (on a regular basis if necessary) to	Construction	Foreman	G36

ID	Measure / Requirement	When to implement	Responsibility	Reference
	ensure they are legally able to accept that waste.			
WE29	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	Foreman / Environment Officer	G36
WE30	All trucks transporting wastes off site will be appropriately licensed to carry the materials to appropriately licensed waste facilities.	Construction	Site Engineer / Foreman	G36
<b>GREENHOUSE GAS AND ENERGY CONSERVATION</b>				
WE31	Flyash content within concrete will be specified where feasible. Contractors will be required to propose recycled content construction materials where they are cost, quality and performance competitive.	Pre-construction and construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG1)
WE32	Reuse of excavated road materials will be maximised as far as possible where they are cost, quality and performance competitive to reduce use of materials (with embedded energy).	Pre-construction and construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG2)
WE33	Steel with high recycled content will be specified where feasible where they are cost, quality and performance competitive. Contractors will be required to propose recycled content construction materials where they are cost, quality and performance competitive.	Pre-construction and construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG3)
WE34	The feasibility of using biofuels (biodiesel, ethanol, or blends such as E10 or B80) will be investigated by the contractor, taking into consideration the capacity of plant and equipment to use these fuels, ongoing maintenance issues and local sources. Works will be planned to minimise fuel use.	Construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG4)
WE35	An energy management plan will be developed during the construction of the project. The plan will include a commitment to monitor on-site energy consumption and identify and address on-site energy waste.	Pre-construction and construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG5)
WE36	Onsite energy consumption is to be monitored as part of the implementation of the CWEMP during construction.	Construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG5)
WE37	Inefficient use of energy is to be identified and measures are to be taken to address on-site energy waste.	Construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG5)
WE38	Roads and Maritime will investigate the use of LED lighting in place of incandescent lamps as part of the project's detailed design, and use them where practicable to reduce electrical energy consumption. Any energy-efficient alternatives will have to meet lighting standards	Pre-construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG6)



ID	Measure / Requirement	When to implement	Responsibility	Reference
WE39	<p>for major roads.</p> <p>An education program will be developed and delivered to the construction personnel to promote energy-efficient work practices.</p>	Construction	Environment Manager / Environment Officer	W2B Submissions / PIR (GHG7)

# 7 Compliance management

## 7.1 Roles and responsibilities

The OHLY Project Team’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 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 sub-plan;
- Relevant legislation;
- Incident response, management and reporting;
- Waste reporting requirements;
- Requirements of the waste hierarchy;
- Waste/ recycle storage requirements;
- Energy efficient best practices; and
- 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.

**Table 7-3 Monitoring and Reporting Program**

Item	Frequency	Responsibility	Reporting
As part of the weekly environmental inspection, waste & energy inspections will be undertaken and recorded on the environment checklist.	Weekly	Environment Manager	Weekly
Carry out waste management and energy use audits to assess extent of waste hierarchy and identify/address energy wastage. This should be undertaken at six monthly intervals during the construction stage of the project and will be used to assess compliance with waste targets / performance criteria.	Six monthly	Environment Manager	Six monthly
Maintain and document types and volumes of wastes generated, re-used, recycled and disposed of.	As required by the relevant legislation and Australian standards	Environment Manager / Superintendent	Monthly
Keep records of waste contractors and landfill facilities used to ensure waste management can be traced from cradle to grave.	As required by the relevant legislation and Australian standards /	Environment Manager / Superintendent	Monthly
Verify licences and permits for handling, transporting and disposal of wastes.	Provision of subcontract agreement	Construction Manager / Environment	Prior to subcontractors works

Item	Frequency	Responsibility	Reporting
		Manager / Superintendent	
Record results of any soil, surface or groundwater sampling.	As required by the relevant legislation and Australian standards	Environment Manager	Monthly
Maintain and record resource usage during construction works (e.g. energy, water, fuel, oil, etc.). Report power consumption (green power and other) in the Construction Compliance Reports.	As required by the relevant legislation and Australian standards	Environment Manager	Three monthly
NGER reporting of waste and energy will be undertaken in accordance with legislative requirements under the NGER Act 2007	As required by the relevant legislation and Australian standards	Environment Manager	Monthly
A Waste Management Register of all waste collected for disposal and/or recycling will be maintained on a monthly basis until final completion in accordance with the RMS G36 specification.	As required.	Environment Manager	Monthly

Additional requirements and responsibilities in relation to inspections, in addition to those in Table 6-1, are documented in *Section 8.2 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 8.4 of the CEMP*.

## 7.5 Reporting

Reporting requirements and responsibilities are documented in the Sections 8.4 and 8.5 of the CEMP, including incident reporting as outlined in the RMS Environmental Incident Classification & Reporting Procedure.

## 7.6 Incident Response

Response to emergency situations will be undertaken in accordance with the Emergency Response & Incident Management Plan and the RMS Environmental Incident Classification & Reporting Procedure. An emergency situation is an event that could present significant risk to the environment, personnel or the community, as determined by the Project Manager, Environment Manager or Supervisor.

Environmental incidents will be reported immediately as required under the RMS Incident Classification and Reporting Procedure. All incidents will be investigated and the appropriate course of action taken to address the issue. Serious environmental incidents will be reported to EPA in accordance with the Protection of the Environment Operations Act 1997 – Duty to Notify.

## **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 WEMP update and amendment**

The processes described in Chapter 8 and Chapter 9 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the WEMP 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 10.2 of the CEMP.

**Appendix A**  
Waste contact list

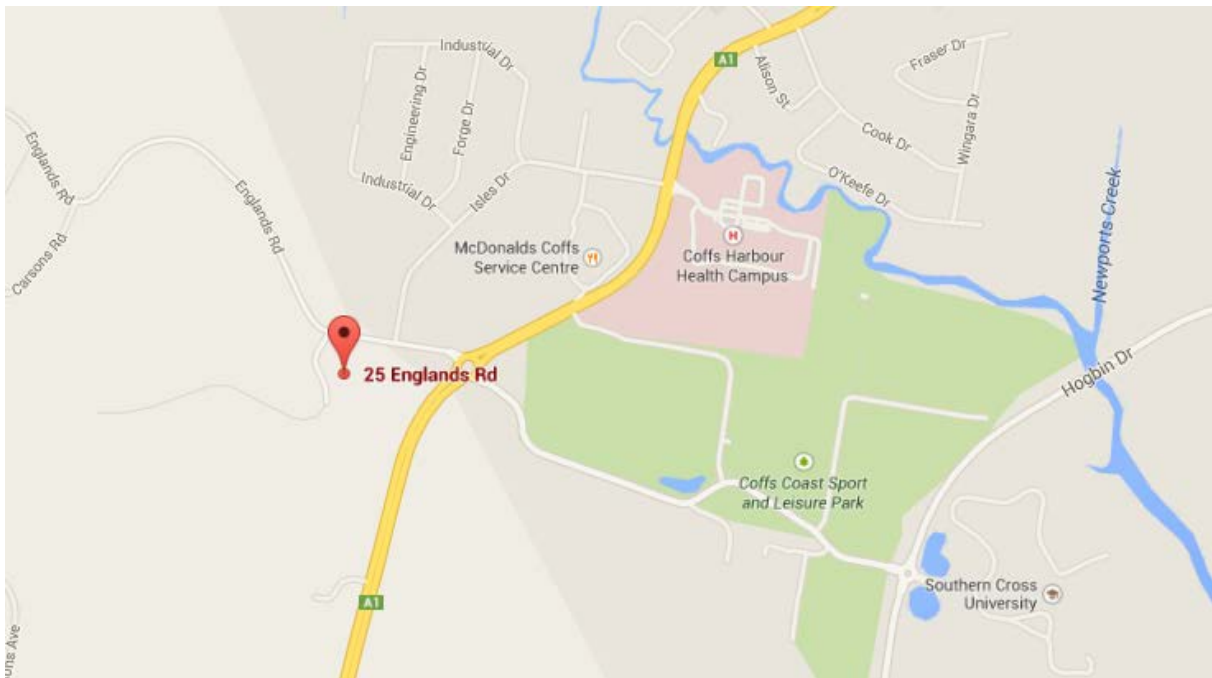
<b>Contractor</b>	<b>Details</b>	<b>Contact Details</b>	<b>Waste Accepted</b>	<b>Waste Recycled</b>
Coffs Coast Waste Services (includes Handybin Waste Services)	Waste and recycling collection	25 England's Road, Coffs Harbour 02 6691 8700	All domestic and commercial waste	All
Cleanaway	Waste and recycling collection	Lot 2 England's Road Coffs Harbour 02 6652 7566	All domestic and commercial wastes	All
Coffs Coast Resource Recovery Park	Hazardous waste	England's Road, Coffs Harbour 02 6648 4580	Gas bottles, batteries, used oil, tyres, paints, household cleaners & chemicals, fluorescent lights, asbestos	All
All Areas Demolition Excavation	Asbestos & recycling	24 Hawke Drive, Woolgoolga 02 6654 9417	All commercial waste	All (excl restricted waste)
Cleanaway	General, commercial and medical waste	England's Road, Coffs Harbour 02 6652 7566	All domestic and commercial waste	All
JR Richards and Sons	Waste and recycling collection	Grafton 1300 579 278	General waste, green waste, liquid waste, gas bottle, batteries	All
SIMS Metal Management	Scrap metal	Craft Cl, Toormina 02 6658 4200	Scrap metals	Scrap metals
Grafton Regional Landfill	Waste & recycling	704 Armidale Rd, South Grafton 02 6641 4980	All commercial waste	All
Grafton Metal Recyclers	Scrap metal	Queen Street, Grafton	Scrap metals	Scrap metals
Clarence Valley Septics	Oily waters and oils	Maclean 02 66453100	Liquid wastes, waste oils	Oil
C & R Tyre Recycling Facility	Tyres	36 Ste house Drive Cameron Park NSW 2304 02 4902 6777	Tyres	Tyres
Broadwater Cogeneration Plant	Surplus mulch	117 Pacific Highway Broadwater 02 6620 8200	Mulch	Mulch
Coffs Harbour Demolitions	Asbestos removal	Fraser Drive, Coffs Harbour 02 6652 3123	Asbestos	Asbestos
Craig Want Roof Plumbing & Asbestos Removal	Asbestos	Grafton 0411 635 623	Asbestos	

**Waste contractors subject to refinement following contract negotiations.**

## **Appendix B**

### Location of waste facilities

# Location of Waste Facilities

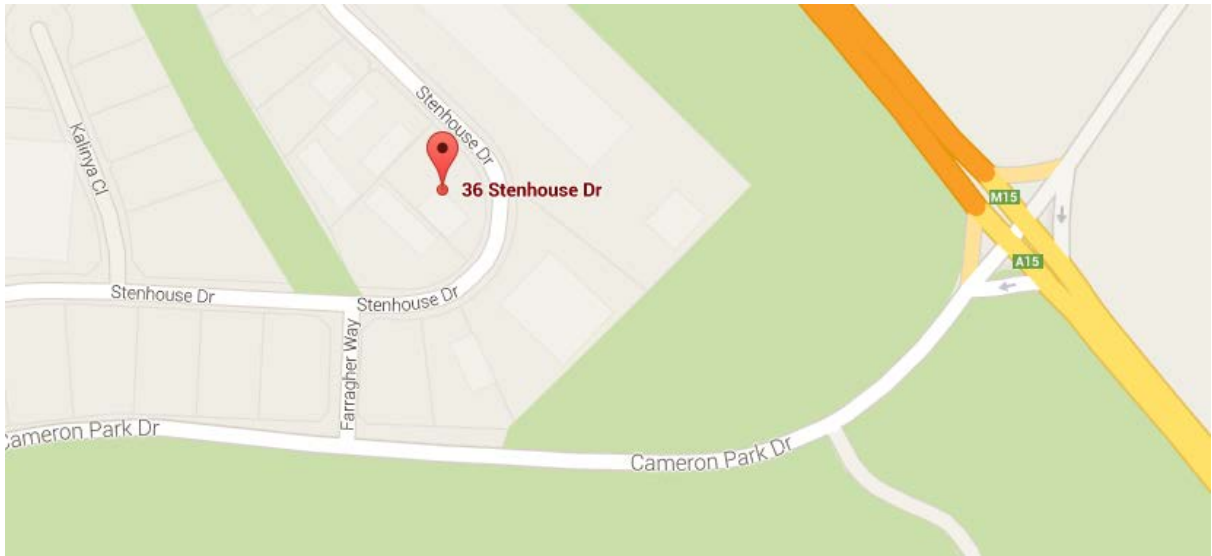


**Coffs Coast Recovery Park**

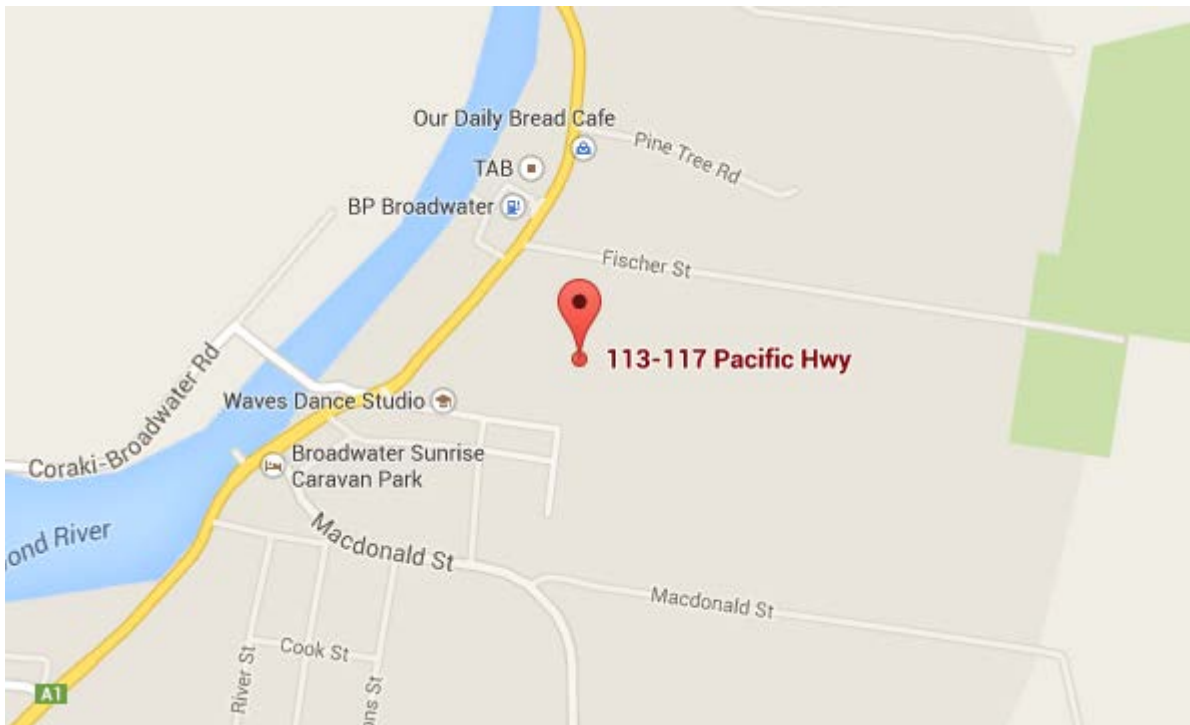


**Grafton Regional Landfill**





**C&R Tyre Recycling Facility**



**Broadwater Cogeneration Plant**

## **Appendix C**

### Surplus material management plan

## Potential Construction Waste

Construction Activity	Waste Type	Waste Classification	Likely Quantity to be generated	Preferred Disposal
Vegetation clearing & establishing access points and access routes	Cleared vegetation	General solid waste (non-putrescible)	60,000 <sup>3</sup> mulch	Reuse onsite, reuse by property owners, State Forest, Council, RMS, Schools, Cogeneration Plant.
Soil excavation & establishing access points and access routes	Excess spoil	VENM, General solid waste (non-putrescible)	Approximately 25,000m <sup>3</sup>	Reuse onsite
	Excess topsoil	VENM, General solid waste (non-putrescible)	Approximately 20,000m <sup>3</sup>	Reuse onsite
	Sediment fencing & geotextile materials	General solid waste (non-putrescible)	To be determined during construction	Reuse on or offsite
Removal of existing road pavement	Asphalt / Pavement	Inert, solid, industrial or hazardous	Approximately 20,000m <sup>3</sup>	Reuse onsite or RMS project
Removal of existing structures-residential houses	Concrete, roof cladding, timber frames, walls	General solid waste (non-putrescible) or special waste (asbestos)	6 residential houses	Remove offsite. Reuse of select materials (i.e. timber) where possible
Site compound usage	Municipal solid waste (plastic bags, food scraps, non-recyclable containers, etc.)	General solid waste	Approximately 40,000kg	Dispose and recycle where possible
	Recyclable domestic waste (milk, cartons, bottles, aluminium cans, etc.)	General solid waste	Approximately 40,000kg	Recycle
	Sanitary wastes	Liquid	Approximately 1 million litres	Dispose or onsite recycled system
Construction basins waste	Sediment Basin	Solid	Approximately 2000m <sup>3</sup>	Reused onsite

## Potential Construction Resources

Construction Use	Resource Type	Likely Quantity to be Use
<b>Excavation Works</b> Plant & Equipment use for road and bridge construction, pavement lying and landscaping Batching plant operation Plant and equipment use for disposal of materials Transport of materials and staff around the site	Fuel (diesel)	7.7 million litres
<b>Bridges and structures</b>	Concrete	51,000 m <sup>3</sup>
<b>Highway pavement</b> <ul style="list-style-type: none"> <li>▪ Rigid pavement option</li> </ul>	Cement Fly ash Coarse aggregates Fine aggregates	20,160 tonnes 11,200 tonnes 100,800 tonnes 188,000 tonnes
<b>Highway pavement</b> <ul style="list-style-type: none"> <li>▪ Flexible pavement option</li> </ul>	Asphalt	35,000 tonnes
<b>Local Roads</b>	DGB/DGS	10,500 tonnes
<b>Construction &amp; dust suppression</b>	Water	250-350 mega litres

## **Appendix D**

### Example waste management register

