Appendix B7

Waste and energy management sub plan

Nambucca Heads to Urunga

October 2015

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Glossary / Abbreviations

Abbreviation	Meaning
AQMP	Air Quality Management Sub Plan
CEMP	Construction Environmental Management Plan
CoA	Condition of Approval
EA	Environmental Assessment
EEC	Endangered Ecological Community
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environmental Protection Licence
EWMS	Environmental Work Method Statements
FM Act	*Fisheries Management Act 1994*
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
PESCP	Progressive Erosion and Sediment Control Plan
SoC	Revised Statement of Commitments included in the Submissions Report
VENM	Virgin Excavated Natural Material
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WEMP	Waste and Energy Management Sub Plan
WRAPP	Waste Reduction and Purchasing Policy

1 Introduction

1.1 Context

This Waste and Energy Management Sub Plan (WEMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the upgrade of the Pacific Highway from Nambucca Heads to Urunga (NH2U). The NH2U Project is Stage 1 of the Warrell Creek to Urunga (WC2U) Project, approved by the Minister for Planning and Infrastructure in 2011.

The NH2U section of the WC2U Project involves construction of approximately 21.6km of new highway from south of Nambucca Heads Interchange to the existing Waterfall Way Interchange at Raleigh, north of Urunga. The NH2U Project is being constructed by Lend Lease.

This WEMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the Roads and Maritime Statement of Commitments (SoC), the mitigation measures listed in the Warrell Creek to Urunga Environmental Assessment (EA) and all applicable legislation.

1.2 Background

The *Warrell Creek to Urunga – Upgrading the Pacific Highway - Environmental Assessment* (RTA 2010) assessed the impacts of construction in terms of waste generation/ management and energy use, within chapter 19 (specifically sections 19.4 and 19.5).

The EA identified the various waste streams that would 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 EA identified the main sources of energy consumption for the Project and estimated the consumption of electricity and fuel to indicatively quantify greenhouse gas emissions. Measures to reduce energy consumption 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 WEMP is part of Lend Lease's 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 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 Lend Lease 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 Lend Lease 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, Lend Lease 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 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 Plan.

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.
- Maximise re-use / recycling of all reusable or recyclable wastes
- Compliance with 100% of the commitments detailed in Table 6-1.

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, specifications and policy documents relevant to this Plan include:

- Waste Classification Guidelines 2014 (EPA Publication).
- Best Practice Waste Reduction Guidelines for the Construction and Demolition Industry (tools for Practice), Natural Heritage Trust, 2000.

3.2 Minister's Conditions of Approval

The CoA relevant to this Plan are listed in 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
B30	Prior to the commencement of construction, 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 OEH, DPI and relevant Council and include, but not necessarily be limited to:	Table 6-1 and this plan
B30(e)(ii)	Measures to monitor and manage waste generated during construction including but not necessarily limited to: general procedures for waste classification, handling, reuse, and disposal; how contaminated materials would be handled and disposed; use of secondary waste material in construction wherever feasible and reasonable; procedures for dealing with green waste including timber and much 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 (+ SWMP for mulch management)

CoA No.	Condition Requirements	Document Reference
C24	The Proponent shall not cause, permit or allow any 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 *Protection of the Environment Operations Act 1997*, 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 all liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with Waste Classification Guidelines (DECC, 2008), or any future guideline that may supersede that document and where removed from the site is only directed to a waste management facility lawfully permitted to accept the materials.	Table 6-1

3.3 Statement of commitments

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

Table 3-2 Statements of commitment relevant to this WEMP

Outcome	Ref #	Commitment	Timing	WEMP Reference
Minimise waste production	WR1	The waste minimisation hierarchy principles of avoid / reduce / re-use / recycle / dispose will apply to all aspects of the Proposal, including work programs, purchase strategies and site inductions. Quarterly assessments will identify opportunities for improvement	Pre-Construction and Construction	Table 6-1
Minimise waste produced and dispose appropriately.	WR2	Where reuse or recycling of water is not possible, it will be sent to an appropriately licensed facility.	Construction	Table 6-1
Minimise greenhouse gas and energy consumption	G1	Wherever feasible and reasonable detailed design will consider whole of life reductions in greenhouse gas emissions and energy consumption.	Pre-Construction and Construction	Table 6-1
	G2	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.	Pre-Construction and Construction	Table 6-1

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 (including asbestos), pipe work, pavements and concrete pathways.
- Excavation wastes (detailed further in Table 5-2).
- 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.
- 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:

- Inappropriate disposal of construction waste, such as excavated soil and rock.
- Inappropriate disposal of vegetation waste from corridor clearing.
- Inappropriate disposal of domestic waste from construction personnel.
- Inappropriate disposal of hazardous waste.
- Litter from Project related activities.

- Generation or spread of contaminated waste/soils, e.g. groundwater, used or expired chemicals, or construction materials.
- Consumption of non-renewable resources such as electricity, diesel and other chemicals.
- Greenhouse gas emissions due to consumption of energy from non-renewable resources.

5 Waste and energy management

5.1 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 EPA *Waste Classification Guidelines Part 1: Classifying Waste* (2014). 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. Relevant WorkCover requirements will also be complied with and detailed further in Project OH&S documentation.

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. Definitions are provided in the guidelines.

Step 4: If not pre-classified, does the waste possess hazardous characteristics?

If a waste has not been classified under Steps 1–3, it must be classified as 'hazardous waste' if it is a dangerous good under any of the following classes or divisions of the Transport of Dangerous Goods Code:

- Class 1: Explosives
- Class 2: Gases (compressed, liquefied or dissolved under pressure)
- Division 4.1: Flammable solids (excluding garden waste, natural organic fibrous material and wood waste, and all physical forms of carbon such as activated carbon and graphite)
- Division 4.2: Substances liable to spontaneous combustion (excluding garden waste, natural organic fibrous material and wood waste, and all physical forms of carbon such as activated carbon and graphite)

- Division 4.3: Substances which when in contact with water emit flammable gases
- Class 5: Oxidising agents and organic peroxides
- Division 6.1: Toxic substances
- Class 8: 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 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 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

Exemption	General Conditions
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 land 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 Order 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 order
Excavated Public Road Material 2014	The excavated public road material can only be stored within the road corridor at the site where it is to be applied to land. The excavated public road material can only be applied to land within the road corridor for public road related activities including road construction, maintenance and installation of road infrastructure facilities. This exemption does not apply to the land application of excavated public road material on any land outside the road corridor. The excavated public road material cannot be applied on private land. The consumer must land apply the relevant waste within a reasonable period of time.

Exemption	General Conditions
Raw Mulch Exemption 2014	Raw mulch only includes: (a) horticultural barks, leaf mulch and wood chip mulch produced from forestry and sawmill residues, and urban wood residues; and (b) branches, tree stumps and bark that are absent of leaves, flowers, fruit and plant propagules. The raw mulch can only be applied to land as a soil amendment. The consumer must ensure that they do not cause or permit the migration of leachate from the land application site. The consumer must not undertake further processing of the raw mulch at the land application site. The consumer must land apply the raw mulch within a reasonable period of time.
Pasteurised garden organics Exemption 2014	Pasteurised garden organics means raw mulch and/or garden organics that have undergone the process of pasteurisation as a minimum as defined in the order. The processor must ensure that the pasteurised garden organics do not contain asbestos, engineered wood products and preservative treated or coated wood residues. The processor must not mechanically size-reduce the pasteurised garden organics through methods such as hammer milling, crushing or grinding, as a way of managing the physical contaminant loading. At the time the pasteurised garden organics are received at the premises, the material must meet all chemical and other material requirements for pasteurised garden organics which are required on or before the supply of pasteurised garden organics under 'the pasteurised garden organics order 2014'. The pasteurised garden organics can only be applied to land as a soil amendment. The consumer must ensure that they do not cause or permit the migration of leachate from the land application site. The consumer must ensure that any application of pasteurised garden organics to land must occur within a reasonable period of time after its receipt.
Reclaimed asphalt pavement Exemption 2014	Reclaimed asphalt pavement means an asphalt matrix which was previously used as an engineering material and which must not contain a detectable quantity of coal tar or asbestos. The reclaimed asphalt pavement can only be: - applied to land for road related activities including road construction or road maintenance activities being: (a) use as a road base and sub base, (b) applied as a surface layer on road shoulders and unsealed roads, and (c) use as an engineering fill material - used as an alternative input into thermal processes for non-energy recovery purposes in the manufacture of asphalt. The consumer must ensure that any application of reclaimed asphalt pavement to land or any use of reclaimed asphalt pavement in connection with a process of thermal treatment must occur within a reasonable period of time after its receipt.
Recovered Aggregate Exemption 2014	The chemical concentration or other attribute of the recovered aggregate listed in Recovered aggregate Order must be met. The recovered aggregate can only be applied to land for road making activities, building, landscaping and construction works. This approval does not apply to any of the following applications: - Construction of dams or related water storage infrastructure, - Mine site rehabilitation, - Quarry rehabilitation, - Sand dredge pond rehabilitation, - Back-filling of quarry voids, - Raising or reshaping of land used for agricultural purposes, and - Construction of roads on private land unless: a. the relevant waste is applied to land to the minimum extent necessary for the

Exemption	General Conditions
	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.

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 (below).

Table 5-2 Classification of potential waste streams

Construction Activity	Waste Type	Waste Classification	Potential Disposal methods
Demolition / Site Clearing	Vegetation (logs, mulched timber, weeds)	General solid waste(non-putrescible)	Native Vegetation – Reuse as biodiversity measures Mulch – Reuse on site or offsite Weeds – Off site disposal or deep burial
	Concrete, asphalt and gravel	General solid waste (non-putrescible)	Crushed and used as backfill or as road base
	Asbestos	Special waste	Off site disposal at an approved facility
	Scrap metal	General solid waste (non-putrescible)	Off site recycling
Bulk Earthworks / Excavations	ENM (Excavated Natural Material) or VENM (Virgin 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 *Waste Classification Guidelines: Parts 1 and 2*	Beneficial reuse onsite (such as noise mounds) Beneficial reuse offsite (s143 requirement) Balance cut and fill earthworks, where possible, to optimise reuse on the Project. Relocate VENM or ENM to another Roads and Maritime project
	Potentially Contaminated Soils		Offsite disposal at an approved facility Off site reuse as engineering fill or used in earthworks On site burial / remediation Final option to be developed in consultation with contamination consultant
Road Construction	Steel Reinforcing	General solid waste (non-putrescible)	Off site recycling
	Conduits and pipes	General solid waste (non-putrescible)	Off site Recycling
	Concrete (solids and washouts) and asphalt	General solid waste (non-putrescible)	Crushed and used as backfill or as road base Alternatively it can be sent to off site recycling
	Timber formwork	General solid waste (non-putrescible)	Reuse onsite where possible or off site recycling
	Packaging Materials, including wood, plastic, cardboard and metals	General solid waste (non-putrescible)	Off site recycling
	Empty oil and other drums	General solid waste (non-putrescible)	Return to supplier where possible Off site disposal at an approved facility

Construction Activity	Waste Type	Waste Classification	Potential Disposal methods
	Pesticides, herbicides, spill clean ups, paints and other chemicals	Hazardous waste / liquid waste / General solid waste (non-putrescible)	Off site disposal at an approved facility
	Metals and electrical cabling	General solid waste (non-putrescible)	Off site recycling / Use on other Roads and Maritime projects
	Aerosol cans	General solid waste (non-putrescible)	Off site recycling
	Sediment basin discharge and solids (sediment)	Liquid waste / General Solid (non-putrescible)	Dust suppression / Beneficial reuse onsite (such as noise mounds or offsite as per SWMP).
Compounds and Workshop Operation	Tyres	Special waste	Off site disposal / recycling at an approved facility
	Waste generated by the maintenance of equipment including air and oil filters and rags	General solid waste (non-putrescible)	Off site disposal at an approved facility
	Oils, grease, fuel, chemicals and other fluids	Liquid	Off site disposal at an approved facility
	Batteries	Hazardous waste	Off site disposal / recycling at an approved facility
	Radiator Fluid	Hazardous waste	Off site disposal at an approved facility
	Hydraulic Fluid	Hazardous waste	Off site disposal at an approved facility
	Domestic waste generated by workers	General solid waste (putrescible)	Off site disposal at an approved facility
	Sewage	General solid waste (putrescible)	Off site disposal at an approved facility
	Waste water / recycled water / storm water	Liquid	Treated and/or reused on-site when biologically and chemically suitable
Office Operation	Paper, cardboard and plastic	General solid waste (non-putrescible)	Off site recycling
	Glass bottles and aluminium cans	General solid waste (non-putrescible)	Off site recycling
	Ink cartridges	General solid waste (non-putrescible)	Off site recycling
	Food Waste	General solid waste (putrescible)	Off site disposal at an approved facility
	Effluent (e.g. STP)	Liquid	Treated and/or reused on site Off site 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.

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 Sub Plan and the 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.

5.6 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 locations 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 (example attached as Appendix C).

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.

6 Environmental mitigation and management measures

A range of environmental requirements are identified in the various environmental documents, including the EA, Submissions Report, Statement of Commitments, supplementary assessments, Conditions of Approval, Roads and Maritime documents Lend Lease EMS Procedures (700 Environmental Series), 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.

Table 6-1 Management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
GENERAL				
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.	Pre-construction / Construction	Construction Manager / Environment Manager	SoC WR1 G36
WE2	Waste management measures from this WRMP 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
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	Site Engineer / Foreman	Good Practice
WE5	All waste will be classified and disposed of in accordance with the NSW EPA "Waste Classification Guidelines"	Pre-construction / Construction	Environment Manager / Environment Officer	G36
WE6	Recycled or secondary waste material will be considered for use in all aspects of the project where feasible and reasonable (such as fly ash for concrete production) in accordance with the NSW Government's Waste Reduction and Purchasing Policy.	Construction	Site Engineer	G36
WE7	Cleared vegetation will be reused or recycled to the greatest extent practicable for example: - 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	Environment Manager	Good practice
WE8	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

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE9	Concrete, asphalt, bricks/masonry and steel products are to be reused on site where possible. Alternatively they will be sent off-site for recycling.	Construction	Foreman	G36
WE10	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	Foreman	Good Practice
WASTEWATER				
WE11	The collection and reuse of captured water for dust suppression, wash down and use in amenities or revegetation will be carried out where possible.	Construction	Foreman	CoA B30(e)(ii)
WE12	Drain concrete wastes or washings from any concrete mixing to sumps	Construction	Foreman / Environmental Officers	AR712
WE13	Wastewater collection points for the workshop wash bays will contain oil/water separators to remove hydrocarbons.	Pre-construction / Construction	Foreman	Good Practice
MATERIALS SELECTION AND RESOURCE CONSUMPTION				
WE14	Any soil or fill materials imported to site for landscaping purposes, including recycled aggregates, must be accompanied by documentation to validate that the materials are suitable for use onsite in accordance with any legislative requirements.	Construction	Foreman / Environmental Officers / Engineers	AR715
WE15	All photocopying and printing paper must contain at least 80% recycled content with documentation to verify its environmental qualities.	Construction	Environment Manager / Administration	AR715
WE16	All timber products should be from proven legal sources. All construction timber should also be from sources that undertake sustainable land management practices and are supported by relevant recognised industry documentation (e.g. Forestry Stewardship Council certification) to confirm the timber was grown and harvested in a sustainable manner.	Construction	Foreman / Environmental Officers / Engineers	AR715
WE17	All manufactured products such as paints, carpets, furnishings, sealants, adhesives used within internal spaces or buildings should preferably be selected to emit low/no Volatile Organic Compounds (VOCs).	Pre-construction / Construction	Foreman / Environmental Officers / Engineers	AR715
WE18	All refrigeration and/or cooling equipment must not contain or use Chloro-fluoro carbon (CFC) gases.	Pre-construction / Construction	Environment Manager / Environment Officer	AR715

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE19	Materials with lower embodied energy content will be investigated and utilised where practicable in preference to those with higher embodied energy content	Pre-construction / Construction	Environment Manager / Engineers	Good practice
WE20	Surplus existing materials (e.g. culverts, site sheds, traffic barriers, rumble grids, pipes, pumps etc.) from other nearby Roads and Maritime or Lend Lease Projects will be identified and utilised where possible	Pre-construction / Construction	Environment Manager / Engineers / Foreman / Superintendent	Good practice
WASTE / REUSE MATERIALS HANDLING				
WE21	Topsoil (weed free) will be stockpiled in accordance with Roads and Maritime criteria in allocated areas and reused for landscaping.	Construction	Foreman / Environmental Officers	G36
WE22	Any contaminated waste will be handled, separated, contained, managed and disposed of to prevent migration and further contamination.	Construction	Foreman	CLM Act G36
WE23	Re-use excavated natural non-contaminated materials on-site where possible. Landfill disposal of clean excavated natural materials should be avoided	Construction	Foreman	AR712
WE24	Set up appropriate storage arrangements to guard against product degradation or damage from weathering or moisture	Pre-construction / Construction	Foreman	AR712
WASTE DISPOSAL				
WE25	Recyclable solid wastes will be segregated (where possible) for recycling purposes	Construction	Foreman / Environmental Officers	AR712
WE26	Clean all litter regularly, provide separate receptacles for putrescible waste, fit litter bins for food scraps with lids and empty before overflowing	Construction	Foreman / Environmental Officers	AR712
WE27	Wastes generated onsite must be stored to prevent unauthorised access and uncontrolled release (including ensuring waste bins with secure lids)	Construction	Foreman / Environmental Officers	AR712
WE28	Discharge effluent into local sewage system or alternatively provide a treatment facility or portable self-contained toilets	Construction	Foreman / Environmental Officers	AR712
WE29	A Waste Management Register of all waste collected for disposal and/or recycling will be maintained on a monthly basis until final completion.	Construction	Environment Manager / Environment Officer	G36

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE30	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	Environment Manager / Environment Officer	G36
WE31	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
WE32	A s143 notice under the PoEO Act (including all necessary information such as nature of material, quantity, dates, transporter, locations etc.) will be completed should the off site (on private property) disposal of road construction waste material or VENM be deemed necessary. Off site disposal of the above material will also consider approval requirements under the Water Management Act 2000 (proximity of disposal site to waterfront land) and the Water Act 1912 (ultimate use e.g. levee banks, flood mounds etc).	Construction	Foreman / Environment Officer	PoEO Act G36 WM Act 2000 Water Act 1912
WE33	The relevant licences 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	Foreman	G36
WE34	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
WE35	All trucks transporting wastes off site will be appropriately licensed to carry the materials to appropriately licensed waste facilities.	Construction	Site Engineer / Foreman	G36
ENERGY CONSERVATION				
WE36	Energy efficient work practices will be implemented, including the consideration of: - Energy efficient design of site buildings; - Design of site construction work sites to minimise unnecessary vehicle movement; - Regular servicing off site plant and equipment; - Training of personnel in energy efficient best practices; and - Use of locally sourced material where available and of suitable quality.	Construction	Environment Manager / Construction Manager / Engineers	G36
WE37	All mains electricity used should be metered to allow site energy consumption to be monitored and recorded.	Pre-construction / Construction	Environment Manager / Environment Officer	AR715

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE38	All new office equipment, kitchen appliances and portable heating/cooling units procured must be energy efficient and display energy efficiency labels/tags. All incandescent lighting must be phased out and replaced with an energy efficient lighting alternative. If relevant, a plan must be in place to phase out any existing incandescent lighting	Pre-construction / Construction	Environment Manager	AR715
WE39	Office computers, photocopiers and printers will be shutdown overnight	Pre-construction / Construction	Administration Manager	AR715
WE40	All temporary buildings should be appropriately insulated and positioned in a manner to reduce the need for additional heating or cooling requirements	Pre-construction / Construction	Environment Manager / Superintendent	AR715
WE41	A greenhouse gas audit of the project will be undertaken to identify opportunities to minimise energy use	Construction	Environment Manager	Good practice
WE42	Opportunities for the incorporation of new technologies (including LED lighting, solar panels etc.) in both the construction and operational stages of the Project will be investigated	Pre-construction / Construction	Environment Manager / Design Manager	Good practice
WE43	Vehicles and other equipment will be switched off when not in operation for periods of more than 15 minutes.	Construction	Foreman / Operators	G36
WATER CONSUMPTION				
WE44	All mains drinking water (potable water) should be metered to allow site mains water use to be monitored and recorded.	Pre-construction / Construction	Environment Officer	AR715
WE45	Water efficient appliances, taps, showers and dual flush toilets must be fitted and used for all new builds and refurbishments. All appliances, taps, showers and flush toilets not assessed to be water efficient on existing assets must be phased out and replaced with a water efficient alternative	Pre-construction / Construction	Environment Manager / Construction Manager / Engineers	AR715
WE46	All hoses should be fitted with a trigger nozzle or device to prevent uncontrolled water flow	Pre-construction / Construction	Environment Officer	AR715
WE47	Construction activities that typically have a high water use will be reviewed to identify viable opportunities for water use reduction (e.g. use of dust suppressants and other measures)	Construction	Foremen / Administration Manager / Engineers	Good practice
RECORDING				
WE48	Receipts for waste transfer and disposal must be retained and checked to ensure all details are correct.	Construction	Environment Manager / Administration Manager / Engineers	AR712

ID	Measure / Requirement	When to implement	Responsibility	Reference
WE49	Record all energy sources used, including: Electricity Use (incl. generators), Gas (Natural Gas, Liquid Petroleum Gas, Compressed Natural Gas), and Fuel (Petrol/Diesel)	Pre-construction / Construction /Post construction	Environment Manager / Administration Manager	AR715
WE50	Record all water from supply mains, non-mains, and water extracted from the sewage system (sewer mining).	Pre-construction / Construction /Post construction	Environment Manager / Administration Manager	AR715
WE51	Record types and quantities of products and materials containing recycled content.	Construction	Environment Manager / / Engineers	AR715
WE52	Record total timber/wood products used, quantity from sustainable sources separated into specific certification groups.	Construction	Environment Manager / Administration Manager / Engineers	AR715
WE53	Record quantities of soil & fill materials imported to the project	Construction	Foremen / Administration Manager / Engineers	AR715
WE54	Record acetylene, bitumen, waste (incl. waste supplier) and any source that is deemed to produce GHG emissions	Construction	Foremen / Administration Manager / Engineers	AR715
MONITORING AND INSPECTION				
WE55	Regular inspections of waste disposal and minimisation measures will be undertaken	Pre-construction / Construction /Post construction	Environment Manager / Environment Officer	AR712
WE56	Quarterly assessments of waste management will be undertaken to identify opportunities for improvements	Construction	Environmental Manager	WR1

7 Compliance management

7.1 Roles and responsibilities

The Lend Lease 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.

Additional requirements and responsibilities in relation to inspections 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 sub plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.3 of the CEMP.

7.5 Reporting

Reporting requirements and responsibilities are documented in the Sections 8.4 and 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 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

Contractor	Details	Contact Details	Waste Accepted	Waste Recycled
All Clean Skips	Waste and recycling collection	Nambucca Heads 02 6669 4423	General Waste, Green Waste, liquid, gas bottles, batteries	All
Boscar Skip Bins	Waste collection	Yarrawonga St Macksville 02 6865 1045	General Waste, Green Waste, liquid, gas bottles, batteries	All
JR Richards & Sons	Waste collection	1300 579 278	General Waste, Green Waste, liquid, gas bottles, batteries	All
Transpacific	Liquid and Hazardous waste collection	1 Pondage Link Homebush NSW 2140 02 97480115	Liquid and Hazardous waste Waste oil, oily rags and drum collection	
Ezy Waste Group	Recycling collection	59-61 South Street, South Kempsey NSW 2440 1300 305 776	N/A	Cardboard, Paper, Glass and Plastics, Metal
Matthews Metal Management	Scrap Metal Facility	7 Harry Boyes Avenue, South Kempsey NSW 2440 Phone: (02) 6562 6425	Scrap Metals	Scrap Metals
Nationwide Oil	Waste oil and drum collection	Cnr Davis Road & Wenban Place, Wetherill Park 02 9604 2611	Waste oil and drums	
ERS Australia Pty Ltd	Oil and oily rag collection	PO Box 46 Doonside NSW 2767 Tel: (02) 4956 6422	Oil and oily rags	Oil
Coffs Harbour Demolitions	Licenced Asbestos Removal Contractor	ph 6652 3123 Lot 52, 10 Fraser Drive, Coffs Harbour NSW 2450	Asbestos	
John Lacey Earthmoving	Licenced Asbestos Removal Contractor	ph 02 6651 5336 2/13a Lawson Cresent, Coffs Harbour 2450	Asbestos	
Waste contact list contractors subject to refinement following contract negotiations				

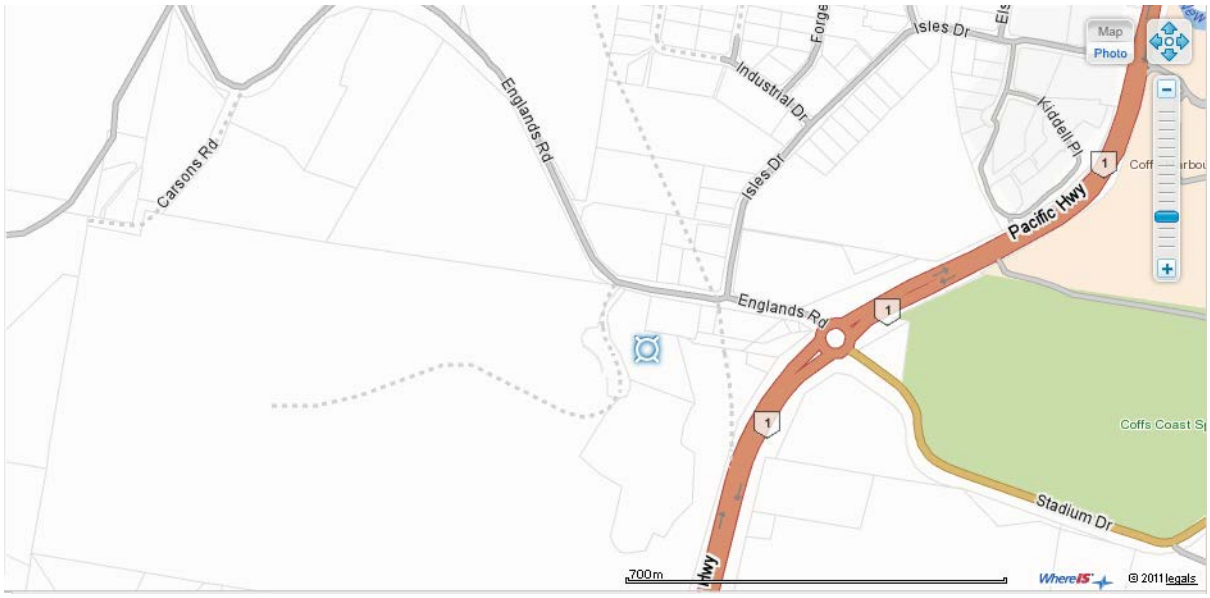
Appendix B
Location of local waste facilities

Landfill and Recycling Centre Details

Facility	Type	Contact Details	Waste Accepted	Waste Recycled
Kempsey Waste Receival and Disposal Facility	Waste Management Facility	Crescent Head Road CRESCENT Head 2440 kscwastedisposal@kempsey.nsw.gov.au Phone: 6562 2042 Mobile: 0429 032942 EPL No. 6269	General Waste, Green Waste, liquid, gas bottles, batteries, untreated ASS/ PASS (subject to results of lab analysis) Asbestos	Cardboard, Paper, Glass and Plastics, Metal
Coffs Coast Resource Recovery Park	Waste Management Facility	25 Englands Road Coffs Harbour 6648 4580 Mobile 0417 226985 EPL No 6267	General Waste, Green Waste, liquid, gas bottles, batteries, Asbestos	Cardboard, Paper, Glass and Plastics, Metal
Nambucca Waste Management Facility	Waste Management Facility	7/11 Old Coast Road Mobile 0429 369821 Nambucca 6568 2170 EPL No. 11386	General Waste, Green Waste, liquid, gas bottles, batteries, Asbestos	Cardboard, Paper, Glass and Plastics, Metal
Transpacific Technical Services	Waste Management and Processing Facility	19 Egret St Kooragang, NSW 2304 Phone 4920 1042	Hazardous Waste, Contaminated Soil	
C&R Tyre Recyclers	Tyre Recycling Facility	36 Stenhouse Drive Cameron Park NSW 2285 Phone 4902 6777		Tyres

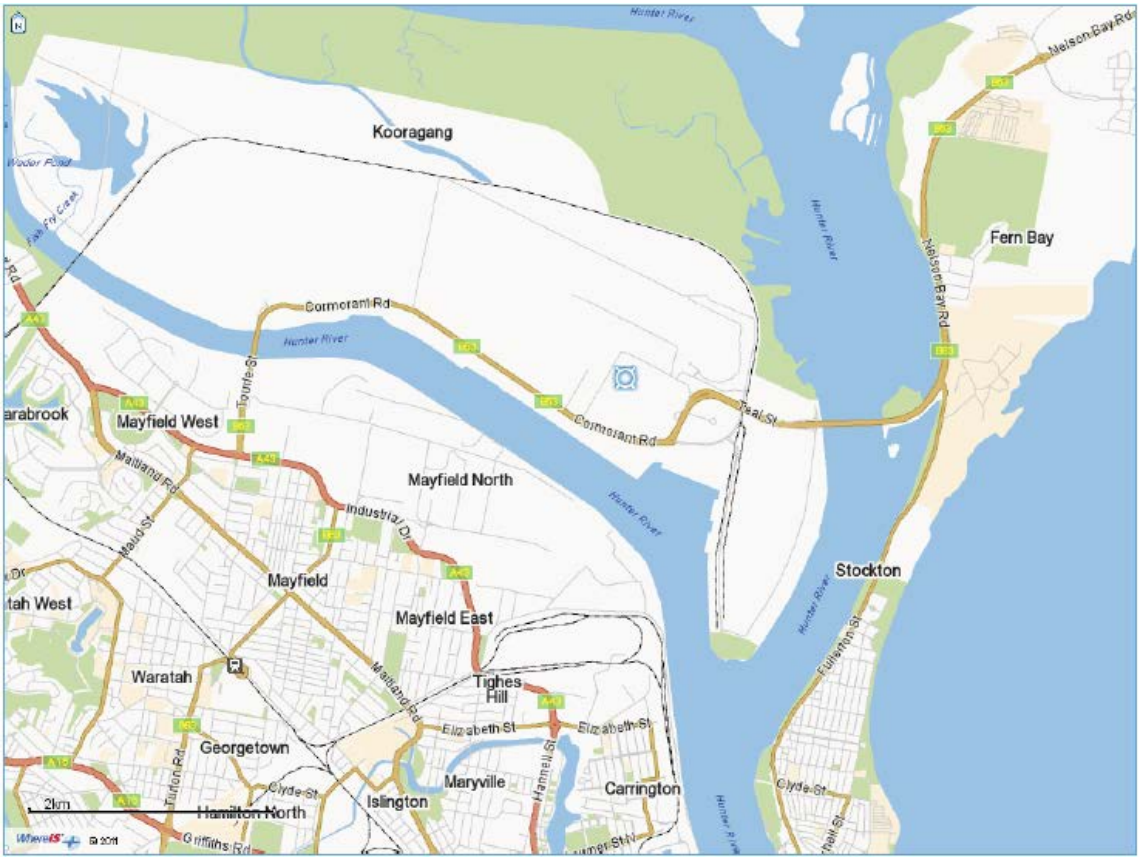
Location of Waste Facilities

Kempsey Waste Receival and Disposal Facility

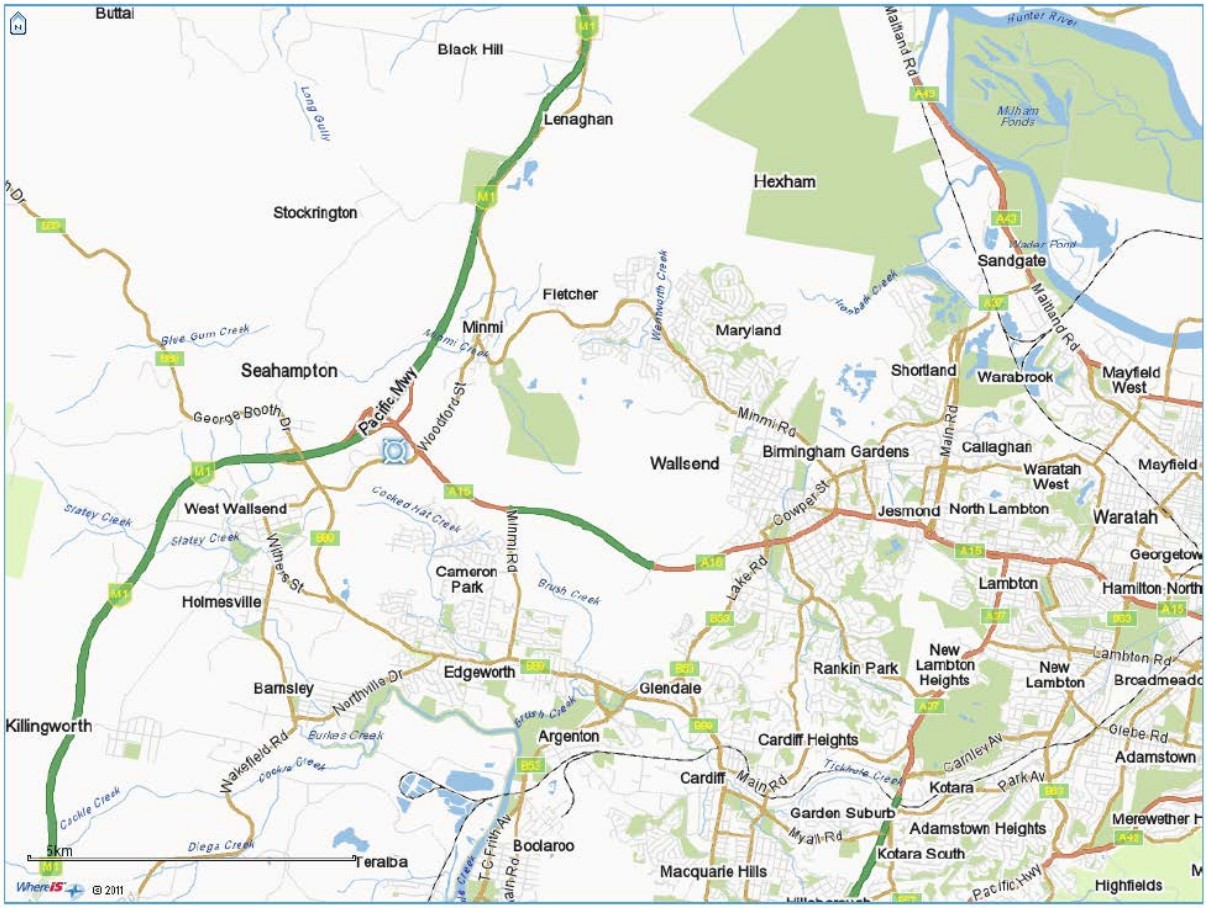


Coffs Coast Resource Recovery Park

Nambucca Waste Management Facility



Kooragang Waste Management Facility



Cameron Park Tyre Recycling Facility

Appendix C
Example waste management register

Waste Management Register							
Date / Time	Waste Classification	Description of waste (e.g. concrete, asphalt, vegetation)	Amount of spoil or waste collected	Transporter	Facility to receive	Waste Use (Reuse, Recycled, Stockpiled or disposed)	Invoice No / Tip Docket Ref