Appendix N of the CEMP

Resource Efficiency and Waste Management Plan

NZ TRANSPORT AGENCY
WAKA KOTAHI

MacKays to Peka Peka Expressway

Revision History

Revision N°	Prepared By	Description	Date
A	Genevieve Smith	Draft for review	10/10/11
B	Genevieve Smith	Revision following review	11/11/11

Document Acceptance

Action	Name	Signed	Date
Prepared by	Genevieve Smith		11/11/11
Reviewed by	Genevieve Smith		12/12/11
Approved by	Graham Spargo		12/12/11
on behalf of	Beca infrastructure Ltd		

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Appendix N.A – Waste Streams Management Register

1 Introduction

This Resource Efficiency & Waste Management Plan (REWMP) ("the Plan") forms part of a comprehensive suite of environmental management plans within the Construction Environmental Management Plan (CEMP, Volume 4) for the construction phase of the MacKays to Peka Peka Expressway Project ("the Project").

Resource efficiency and waste management should be given early consideration in the design stages of road projects. Large construction projects traditionally generate large quantities of materials identified as waste. Inadequate material management on-site and cross-contamination due to poor waste segregation can compound this problem. In addition, the waste generated has the potential to have adverse environmental effects if not managed appropriately. Material traditionally regarded as waste may possess qualities (with or without additional treatment) which enable its use as a resource elsewhere within the Project boundary or Project locality.

1.1 Purpose and scope

The purpose of the Plan is twofold:

- To document decisions made by the Project team[1] during the design phase of the Project that impact positively on resource efficiency; and
- To describe how the Project team will manage waste generated from the construction phase in a sustainable manner.

This will be achieved by:

- Using smarter design and construction methodologies to reduce waste;
- Identifying opportunities for avoidance, reuse, recycling or recovery for all major waste streams;
- Considering landfill disposal as a final option;
- Measuring and tracking waste arisings through the Project; and
- Actively promoting waste awareness through assigning responsibilities, training and staff engagement.
- Implementing controls to avoid and minimise potential impacts associated with energy generation and consumption.

The Plan is intended to be a live document and will be updated quarterly, throughout the course of the Project, to reflect material changes to construction methodologies or management practices to reduce waste. This document shall be formally reviewed yearly and a revised plan will be forwarded to Greater Wellington Regional Council (GWRC) for comment.

[1] This Management Plan refers to the Project team as carrying out works on behalf of and as contracted by the NZTA. The NZTA is the requiring authority and the consent holder.

1.2 Performance standards

1.2.1 Relevant legislative and policy frameworks

The management of waste is currently subject to a complex array of statutes, bylaws and regulations, policy documents and waste management plans. Key legislation/policies that are relevant to the management of wastes are summarised in **Table 1** below.

Table 1 Current Applicable Legislation / Policies

Title	Requirements and Objectives
New Zealand Waste Strategy	The strategy provides a direction from the Government for waste reduction and the improved management of all categories of waste (liquid, solid and gas). It requires New Zealanders to reduce harmful effects of waste and improve the efficiency of resource use to reduce impacts on the environment and human health, and to capitalise on potential economic benefits.
Waste Minimisation Act 2008	The Act aims to reduce the environmental impact of waste in New Zealand by encouraging waste reduction and the better use of materials, and reprocessing materials in New Zealand. The Act promotes product-stewardship requiring producers to take responsibility for their products at the end of the products 'life' and places a levy on waste going to landfills to recognise the cost of waste disposal on the environment.
Local Government Acts 1974 and 2002 (LGA)	Part XXXI of the LGA requires territorial authorities to have responsibility for 'efficient and effective' waste management. Under section 145 of the LGA, territorial authorities may pass bylaws to protect the public from nuisance and maintain public health and safety.
Resource Management Act 1991	Section 15 restricts the discharge of contaminants to the environment and section 17 outlines the duty to avoid, remedy or mitigate adverse effects on the environment, both of which can be applied to the management of waste.
Hazardous Substances and New Organisms Act 1996 (HSNO)	Provides regulations and standards for storage and disposal of hazardous wastes.
NZ Transport Strategy	Details expectations that the transport sector will: ▪ Reduce negative impacts on land...; and ▪ Make more efficient use of resources, reduce the use of its non-renewable resources, and shift over time from non-renewable to renewable resources.
NZTA Environmental Policy	The policy includes using and managing resources efficiently: ▪ Materials and energy are key components of NZTA's business and these resources are used in a manner that recognises supply limitations and life cycle costs. Particular emphasis is given to reusing and recycling resources.
The Alliance Environmental Policy	We will manage our work to ensure we respect, preserve and enhance our environment. We will achieve this by: ▪ Reducing waste and preserving resources.

Title	Requirements and Objectives
Regional/District Objectives	KCDC has formally adopted a Zero Waste to landfill goal and is also registered as a Zero Waste Council. GWRC has an objective in the Regional Plan to reduce the quantity of waste disposed by promoting efficient use and conservation of resources.

1.2.2 Project objectives

The principal objectives for resource efficiency and the management of waste for the Project have been considered in the context of the waste hierarchy, the possible impacts of waste on the environment and the relevant legislative and policy framework. The objectives for resource efficiency and the management of waste for the Project are as follows:

- Reduce the proportion of waste that is sent to landfill.
- Reduce the overall material use in construction.
- Reduce materials wasted in construction.
- Increase the use of recovered materials and materials with above-average levels of reused and recycled content.
- Increase number of specifications where recycled materials can be used.
- Increase the number of pre-cast elements.
- Increase the number of contracts including commitments to reduce waste.
- Prevent pollution associated with the management and disposal of waste material.
- Increase employee, sub-contractor and sub-Alliance parties' awareness of their obligations with regard to waste management and recycling opportunities.

1.3 Related environmental management plans/maps

This Plan is a sub-plan to the Construction Environmental Management Plan (CEMP, Volume 4). There are a number of other sub-plans which make reference to the management of specific waste materials. The relevant sub-plans are summarised in **Table 2** below. Where the handling and disposal of specific waste materials (e.g. contaminated soils or hazardous wastes) are covered by other sub-plans, those plans shall take precedence over this Plan.

Table 2 Relevant Environmental Management Plans and Maps

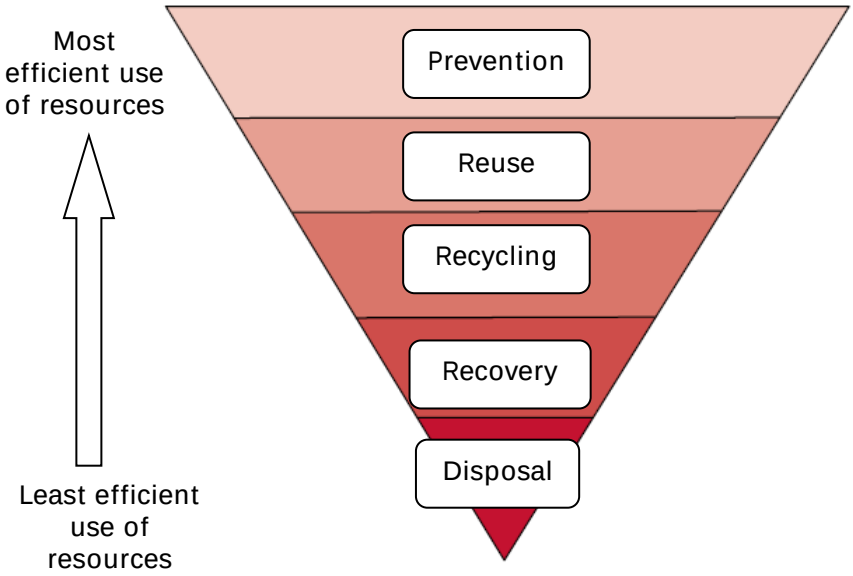
Plan/Map	Relevance	Location
Hazardous Substances Management Plan (HSMP)	Storage, handling and disposal of hazardous substances.	CEMP Appendix L, Volume 4
Contaminated Soils and Groundwater Management Plan (CSGMP)	Management of clean and contaminated soil and groundwater during construction activities.	CEMP Appendix K, Volume 4
Environmental Maps	Receiving environments, sensitive receptors and construction yard location.	CEMP Appendix C, Volume 4

1.4 Environmental impacts summary

1.4.1 The waste hierarchy

The waste hierarchy aims to encourage the management of waste materials in order to reduce the amount of waste materials produced and to recover maximum value from the wastes that are produced.

It is not applied as a strict hierarchy as many complex factors influence the optimal management for any given waste material. However, as a guide, it encourages the prevention of waste, followed by the reuse and refurbishment of items, then value recovery through recycling and composting of materials.



Waste prevention, reuse, recycling and recovery are collectively defined by the Organisation for Economic Co-operation and Development (OECD) as waste minimisation.

Energy recovery is an important level in the hierarchy as many materials have significant embedded energy that can be recovered (e.g. wood waste).

Finally, waste disposal should only be used when no option further up the hierarchy is possible.

Any construction project should look to the waste hierarchy to increase resource efficiency and decrease the total amounts of waste produced.

The generation, transport and storage of waste can have adverse impacts on the environment. Listed below in **Table 3** are the environmental aspects that can be adversely affected:

Table 3 Environmental Aspects

Aspect	Construction Waste	General Site Office Waste
Resource Depletion	Eliminating, minimising, reusing, reducing and recycling wastes conserves the use of virgin materials.	Eliminating, minimising, reusing, reducing and recycling wastes conserves the use of virgin materials.
Greenhouse Gases	Haulage of waste materials generates exhaust emissions to the atmosphere.	Disposal of general waste to landfill generates methane.
Air Quality	Uncovered dusty wastes may be blown across the site and beyond site boundaries.	Litter may be blown across the site and beyond site boundaries.
Aquatic and Terrestrial Ecology	Contaminated discharge from incorrectly stored waste materials.	Food waste encourages the prevalence of rodents.
Visual Quality	Poor housekeeping on site reduces the amenity value and materials may spread onto surrounding properties.	Litter on site reduces the amenity value and may spread onto surrounding properties.
Human Health	Hazards from the mixing of hazardous and non-hazardous waste.	Hazards from the mixing of hazardous and non-hazardous waste.

2 Designing out waste

Civil engineering projects usually require large quantities of materials and have the potential to generate large quantities of waste. The biggest opportunities to reduce material use and waste occur through decisions made at the design stage, as these determine the approach that will be adopted at the construction stage.

Key objectives of this Plan are to reduce materials used in construction and reduce the proportion of waste sent to landfill. This will be achieved by efficient design, materials selection, construction techniques, and operational methods.

Reducing the use of fossil fuel resources where possible (for example haulage or double handling of materials/waste) is also a key consideration on large projects.

A register of design decisions and construction methodologies which contribute to materials and energy efficiency and reducing waste to landfill shall be kept during the design stages of the Project.

3 Raw materials handling

Purchases of raw materials that are not used and contribute to the waste stream have a direct influence on overall Project delivery costs. Often the cost of the removal of unused raw materials as waste exceeds its purchase cost by a significant margin. This is particularly the case when waste segregation is not practiced and inert materials become contaminated by general site rubbish.

3.1 Receipt and storage of materials

During the pre-construction phase, the main contractor will identify the requirements for the receipt and storage of materials which will include the identification of the locations for receiving and storing materials as well their handling procedures. Locations for materials storage will include the Project Yard, Interchange Yards and Bridge Yards (see drawing numbers CV-CM-400 to 411, Construction, Office and Yard Plans, Volume 5). Any requirements which may restrict or limit the receipt or storage of materials will be identified and mitigating measures put in place.

Material storage areas will be clearly demarcated in each yard and managed to prevent the areas becoming overfilled and ensure that they are suitable for the materials. Materials will be stored and handled to avoid damage. Materials which require special handling to prevent damage/waste will be identified (e.g. topsoil). Good site security such as perimeter fencing and security personnel where required will minimise materials lost due to theft or vandalism.

3.2 Segregation

Material segregation policies are key to ensuring that practices that cause cross-contamination do not occur, such as the mixing of sub-soils and top soil, or the contamination of clean materials such as concrete, bricks, etc., with excavation wastes, packaging or other materials. There will be clear site signage and appropriate locations for materials and waste storage to assist with material segregation at each yard.

Procedures will be implemented to ensure that otherwise suitable materials do not become unacceptable due to adverse weather impacts occurring at the handling or long term storage stages. Vegetation and topsoil, for example, will be left undisturbed until the area needs to be stripped or the materials required for other purposes. Materials will be ordered for 'just-in-time' delivery where possible to reduce the need for long-term storage on-site and with it the possibility of weather-related deterioration.

3.3 Project completion

At the Project completion and demobilisation stage it is vitally important to prevent any excess materials being ordered as it is unlikely they will be able to be redeployed to activities elsewhere on site. The demobilisation process will implement a robust reverse logistics strategy to capture all unused materials for either return to supplier or reuse elsewhere to prevent valuable resources being disposed.

4 Waste streams

The main waste types generated from the key construction activities are listed in the table in **Appendix N.A**. This table also identifies where the waste is likely to be generated, the estimated quantities, and how the waste will be managed i.e. reused, recycled, recovered or disposed of to landfill.

4.1 Waste code

Some of the waste streams listed have been given a six digit code. This code relates to the classification of the waste according to the Fletcher Building Waste Reporting Tool, which will be used to track waste through the life of the Project. The Project Environmental Manager will have access to this on line tool during the construction phase of the Project.

4.2 Hazardous and potentially hazardous waste

The requirements and procedures for disposal of unused hazardous substances and their associated packaging are covered by the Hazardous Substances Management Plan (CEMP Appendix L, Volume 4). This section covers all other wastes that are identified as hazardous or potentially hazardous.

Identifying a waste as hazardous requires a certain degree of professional knowledge about the process that generated the hazardous waste, and the chemical and physical characteristics of the waste. Most handlers of hazardous waste will have the knowledge and experience needed to identify hazardous waste correctly. However, in some instances it may be unclear as to whether or not a material is a hazardous waste. It is important that a consistent process is followed when determining whether a waste is hazardous. Should definitive classification of whether a waste is hazardous be required then the Guidelines for the Management of Hazardous Wastes provided by the Ministry for the Environment (MfE) should be referred to.

A hazardous waste is any waste that contains hazardous substances at concentrations which cause it to be explosive, flammable, oxidising, corrosive, toxic or ecotoxic. Priority hazardous wastes for New Zealand that are likely to be generated during construction of the Project include:

- Batteries and accumulators;
- Waste oil/fuel and oil; and
- Waste acids and alkalis.

Potentially hazardous wastes generated during construction include wastes that have been in contact with or mixed with hazardous substances. This can include, but is not limited to:

- Used spill kit adsorbents;
- Materials contaminated with oils, fuels, or bitumen; and
- Materials contaminated with acids or alkalis.

The hazardous substances used during construction of the Project are listed within Appendix L.A of CEMP Appendix L, Volume 4.

All wastes identified as hazardous or potentially hazardous will be managed according to the following procedure:

- Hazardous (or potentially hazardous) waste will not be co-disposed with general waste streams. Hazardous (or potentially hazardous) waste will be collected and stored separately to general waste.
- Appropriate controls will be applied for storage of the waste according to the material type and potential hazards (for example: bunding of waste oils and/or separation of incompatible substances). The SDS for the relevant hazardous substance will be referred to.
- Hazardous waste (or potentially hazardous) will be removed and disposed of by a suitably licenced hazardous waste disposal operator.
- Disposal options may include disposal at a landfill permitted to accept hazardous waste, incineration or treatment (other than dilution) to render the substance non-hazardous.

- Where a waste has been definitively identified as hazardous according to the MfE definition, it will be classified and tracked from its point of generation to its point of disposal using the forms and recording system in the MfE *Hazardous Waste Guidelines: Identification and Record Keeping.*

5 Waste segregation and recycling points

5.1 Waste and recycling storage areas

The main construction waste and recycling storage area will be at the Project Yard, where skips and bins for all key hazardous, recyclable and general (non-hazardous) waste streams will be located.

Wastes generated on site will be segregated where possible at Bridge Yards or Interchange Yards and transported back to the Project Yard for recycling and disposal according to material type (see drawing numbers CV-CM-400 to 411, Construction, Office and Yard Plans, Volume 5 for yard locations). Wastes unable to be segregated at site will be sorted on return to the Project Yard and recycled or disposed of appropriately.

No wastes shall be disposed of on site, other than peat which may be used in landscaping. Construction areas will be kept tidy and clear of litter.

5.2 Site offices

In order to encourage a high level of recycling of office-type wastes, personal waste bins will not be issued to each desk at the main site office. General waste and recycling bins will be placed at key locations around the office. Each desk will be issued with a paper recycling box. Systems shall be put in place to recycle potentially hazardous wastes such as waste electronic equipment, printer cartridges and fluorescent lights. Informative posters will detail what can and cannot be recycled.

Mixed recyclable bins and paper recycling boxes shall also be provided in site offices in Bridge Yards, Interchange Yards and the Pre-Cast Yard offices to encourage waste segregation.

5.3 Minimisation of discharges

To minimise the environmental effects from the storage of waste the following measures shall be taken:

i) for skips and bins:

- Use appropriate containers for waste storage e.g. watertight plastic wheelie bins, plugged skips, sealed drums.
- Locate all skips and bins away from sensitive receptors and areas of water movement to minimise potential for water or soil contamination.
- Keep the lids of all bins closed, especially those that contain food waste to prevent scavenging by birds and animals.
- Cover with netting any skips containing materials likely to be wind-blown.
- Keep waste storage areas tidy.
- Screen any storage areas abutting residential or recreational areas to prevent issues relating to visual amenity.

ii) for stockpiles:

- Refer to the Erosion & Sediment Control Plan (CEMP Appendix H, Volume 4) for discharge control from stockpiles.
- Refer to the Construction Air Quality Management Plan (CEMP Appendix G, Volume 4) for control of dusts in general.

5.4 Segregation and labelling

The reuse of materials on site is encouraged by segregation practices which avoid contamination. Materials available for reuse will be placed in delineated bays or stockpiles. Wastes for recycling or disposal will be placed in labelled skips/bins and/or delineated bays.

All material or waste receptacles will be clearly labelled as to the contents and where appropriate, a colour coding scheme may be introduced.

5.5 Pre- cast yard

The Pre-Cast Yard will be located in the Project Yard. Appropriate waste receptacles will be located at the Pre-Cast Yard specific to the waste streams arising from those activities. Forms will be available for ready pour of waste concrete.

5.6 Off- site concrete batching plant

Concrete may be sourced from a local off-site batching plant, owned and operated by Firth Ltd. Firth has an environmental management plan for the site that includes details on how waste (generated by the site and returned to the site) will be managed.

Firth will: *'…review and/or modify existing (or introduce new) processes and working practices in order to minimise the production of waste. Where waste cannot be avoided, environmentally sound treatment and disposal routes will be sought, or markets found for its use as a resource e.g. slurry as a fertilising additive, sludge for roading or foundation base-course, or inter-lock blocks etc.'*

Loads of concrete delivered to the Project site will be usually completely used on site, with little waste. Forms will be available for ready pour of small amounts of waste concrete arising on site. Any returned loads due to wrong specification or over-ordering will be returned to the plant and managed according to the above process.

5.7 Off- site asphalt plant

Asphalt may be sourced from asphalt plants owned and operated by Higgins Group Holdings Ltd. Small amounts of asphalt waste will be generated at the site and are managed in the following manner:

- The small amount of excess asphalt generated at the end of a production run is set aside in a stockpile. It is then fed through a closed circuit crusher and reintroduced back into the manufacturing process at a later date.
- Small amounts of cold asphalt product not able to be recycled is broken up and used as fill in pavements.

Loads of asphalt delivered to the Project site will be usually completely used on site, with little waste. Any returned loads due to spoilage or over-ordering will be returned to the plant and managed according to the above process.

6 Demolition and deconstruction

Establishing the quantity of bulk materials which could arise from the demolition and deconstruction process and linking this to an overall site materials management plan can deliver cost savings and environmental benefits. Significant additional benefits can be made by planning ahead and coordinating the movement of materials to the point of use.

Benefits include:

- Generation of recycled aggregates that can be re-processed on-site (or nearby) and used for a variety of applications.
- Reduction in vehicle movements and the distances that materials are transported.
- Reuse of materials leads to lower carbon footprints than disposal, recycling and the use of new materials (even materials with significant recycled content).

6.1 Houses

A pre-demolition audit will take place to identify the key building and infrastructure materials which will arise from demolition and excavation works. This will establish the bulk quantities available on site, as well as the potential for recovering value from timber, steel, etc. for recycling. It will also provide information on potentially contaminated soils or hazardous materials, if present, which may require specific removal procedures to be followed.

The general approach for demolition and deconstruction will be as follows:

a. Where possible, houses and buildings will be relocated.

b. Where this is not possible the deconstruction sequence may involve:

- For houses and buildings:
  - Removing any remaining house contents, furniture, fittings, carpets, lino, etc.
  - Removing permanent fixtures, such as doors, windows, accessible plumbing, etc.
  - Removing any hazardous materials from houses, garages or sheds.
  - Demolishing the structure in stages, e.g. roof, roof trusses, walls, etc.
  - Demolishing associated structures e.g. garages, sheds.
- For surrounding grounds:
  - Removing vegetation, trees etc.
  - Demolishing driveways, fences etc.

Waste fractions resultant from the demolition process will be segregated for recycling where possible.

6.2 State Highway 1 (SH1) refurbishment

Waste streams generated as part of the existing SH1 route refurbishment will be managed according to the recycling/disposal routes identified in **Appendix N.A**.

7 Energy efficiency

By adopting an energy efficiency strategy during the construction of the Project the following benefits will be gained;

- Energy efficient equipment operation will reduce energy demand and associated costs; and
- Reduced energy demand will reduce greenhouse gas emissions through direct means (i.e. less fuel is consumed and therefore less emissions are generated), and indirect means (i.e. less electricity is consumed, therefore less coal is burnt and less emissions are generated).

To avoid and minimise potential impacts associated with energy generation and consumption, the following environmental controls and methods will be implemented:

- Purchase energy efficient products and services where applicable and financially viable.
- Construction methods to be energy and time efficient including using well-maintained equipment, minimising equipment down-time through preventative maintenance programmes, reducing idling times, and monitoring emissions for signs of inefficiency (e.g. visible exhaust emissions).
- Specify energy saving measures in the main site office where applicable (e.g. timers or motion detectors on lights).
- Undertake an initial energy audit during construction and identify measures to improve energy efficiency. Subsequent audits should use the initial audit data as a baseline.
- Implement an energy management awareness programme as part of the Project induction, site induction and where applicable, ongoing site toolbox talks.
- Consider using the Arup CO_2ST Tool during detailed design and construction stages to calculate the carbon dioxide and cost associated with infrastructure projects.

Where greenhouse gas emissions are to be calculated the NZTA Greenhouse Gas Workbook should be used.

8 Performance tracking

8.1 Waste tracking

The quantities of waste generated by the Project can be tracked by individual waste stream using the Fletcher Building Waste Reporting Tool, which will be made available to the Project Environmental Manager. This tool is an on-line database that allows wastes to be classified in line with the Ministry for the Environment waste classifications. By actively measuring, recording and monitoring the wastes produced by the construction activities, performance can be measured against targets. Initiatives to change the management of individual waste streams and move up the waste hierarchy can be tracked using the tool.

Copies of waste dockets shall be retained for all hazardous wastes and contaminated soils that require disposal to a licensed solid waste landfill.

8.2 Waste contractors

Waste management contractors will be required as part of the waste recycling/disposal contracts to provide data on waste materials removed from the site, in a format consistent with the reporting requirements of this Plan. Key contacts for waste management contractors shall be attached to this Plan when they are defined and agreed.

8.3 Waste costs

The Fletcher Building Waste Reporting Tool can record disposal costs for each waste stream. The costs of waste disposal should include the following items:

- The cost of the purchase of un-used raw materials that end up in the waste stream;
- Handling costs, such as the use of the machinery employed to load any waste prior to its removal of the waste off-site;
- Transportation and haulage costs;
- Skip and other long term container rental; and
- Final disposal costs (including any landfill tax).

8.4 Performance targets

Targets for resource efficiency and the management of waste will be set in line with the objectives listed in Section 3.2 of this Plan.

9 Inspection and auditing

9.1 Inspections

Frequent (monthly) inspections of the raw materials storage areas and the waste and recycling storage areas shall be undertaken throughout the Project by the Environmental Manager (or delegate) and either the Team Leaders or Managers. The inspections shall ensure that raw materials are being stored appropriately and are not being damaged or cross-contaminated, that recyclable materials are being separated correctly, and that wastes are appropriately contained and not discharging into the environment or causing a nuisance in terms of odour or litter. A checklist for monthly inspections is included in the Monitoring and Reporting Matrix as part of the CEMP, Volume 4. Reporting of monthly inspections will be within regular progress updates to NZTA. Feedback from the monthly audits will be given at toolbox talks to encourage or change behaviour of staff.

Where necessary, as a result of changes to activities/construction methods and community complaints, additional inspections shall be undertaken.

For requirements for inspections of stockpiles on site, refer to the ECSP.

9.2 Waste audits

Waste audits provide a useful way by which the implementation of the Plan can be monitored. They provide detailed information on why waste is being generated, what the quantities and costs are and the behaviours of staff and contractors on site. This information can then be fed back into the Plan and used to benchmark performance.

A comprehensive waste audit will be carried out 6 monthly involving a physical sort of materials in skips to allow data gathering for performance measurement, and identification of possible further training requirements to change behaviour of contractors and staff if required.

10 Communications and Training

Effective and regular communication at all levels reinforces the message that waste management issues are taken seriously and that the Plan has the active support of the main contractor.

Environmental issues will be a regular topic for tool box talks, including highlighting waste disposal or raw material handling practices. The results of waste audits and inspections shall be communicated via tool box talks to encourage and remind staff how waste materials should be segregated, and the opportunities for reuse.

Environmental training for all new staff, sub-contractors and sub-Alliance parties shall be undertaken as part of the site induction programme detailed in Section 3.3 of the CEMP, Volume 4. The environmental induction training shall include information on the following aspects of this Plan:

- Roles and responsibilities for waste management on the Project.
- Recycling and disposal routes for key waste streams, including location of skips and bins for the segregation of waste. Raw material handling procedures to be followed;
- Environmental awareness on the benefits of recycling/reuse versus disposal of waste; opportunities for reuse of specific (waste) materials generated by the Project.
- Clean up and general housekeeping requirements;
- Spill management and emergency management; and
- Environmental and waste audits.

10.1 Sub- contractors and sub- Alliance parties

Sub-contractors and Sub-Alliance parties will be effectively prepared, managed and monitored so that they are aware of their responsibilities under the Plan and are able to supply any required information and adhere to the Plan.

11 Responsibilities

Implicit in the effective management of raw materials and waste in any construction project is the comprehensive allocation of responsibilities to key individuals.

Details of roles and responsibilities associated with managing environmental effects from construction on the Project are set out in Sections 3.1 and 3.2 of the CEMP, Volume 4. The Project team's Environmental Manager shall be responsible for supporting the implementation of the requirements of this Plan and communicating any issues to the Project Management Team and NZTA. Team Managers/Leaders shall be responsible for ensuring the instruction of workers, implementation and overseeing of the requirements of this Plan, including monitoring the effectiveness of the methods set out in this Plan.

All personnel working on the Project including sub-contractors and sub-Alliance parties are responsible for following the requirements of this Plan.

12 Plan review

This REWMP, including environmental controls and procedures, shall be reviewed to ensure that it remains applicable to the activities being carried out.

The REWMP will be updated, with the necessary approval, throughout the course of the Project to reflect material changes associated with changes to construction techniques or the natural environment and consent conditions. A copy of the revised plan will be passed to Greater Wellington Regional Council for comment.

A management review will be undertaken at least annually by the Project Management Team and the NZTA Environmental Representative. The management review will be organised by the Environmental Manager, and the Project team will be informed of any changes to this Plan through the regular Project communications processes. The review will include:

- Any significant changes to the construction activities or methods;
- Key changes to roles and responsibilities within the Project;
- Changes to industry best practice standards or recommended waste management techniques;
- Changes in legal or other requirements (social and environmental legal requirements, NZTA objectives and relevant policies, plans, standards, specifications and guidelines);
- Results of inspection and maintenance programmes and logs of incidents, corrective actions, internal or external assessment; and
- Public complaints.

Reasons for making changes to the REWMP will be documented. A copy of the original REWMP document and subsequent versions will be kept for the Project records and marked as obsolete. Each new/updated version will be issued with a version number and date to eliminate obsolete documentation being used.

13 References

Construction Environmental Management Plan, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Kirkby, C. Construction Air Quality Management Plan: CEMP Appendix G, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Ridley, G. Erosion and Sediment Control Plan: CEMP Appendix H, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Sadlier, E. Hazardous Substances Management Plan: CEMP Appendix L, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Smith, G. Contaminated Soils and Groundwater Management Plan: CEMP Appendix K, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Appendix A

Waste Streams Management Register

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Ground Clearance						
Vegetation (scrub, gorse, bush) & small trees	20 02 01	TBC	On site	Recycle	On site	Chipped and mulched and used in erosion and sediment control devices, and landscaping
Large trees and significant trees	None	TBC	On site	Reuse	Off site	Sale to timber companies, possible relocation of individual trees around district
Demolition						
Concrete	17 01 01	TBC	On site	Recycle	Off site	Crushed and recycled as fill on Project where there is sufficient volume
Brick	17 01 02	TBC	On site	Recycle	Off site	Salvaged for recycling where possible. Send to salvage yard.
Tiles and ceramics	17 01 03	TBC	On site	Recycle	Off site	Salvaged for recycling where possible. Send to salvage yard.
Non-ferrous metals	Various	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Ferrous metals	Various	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Wood	17 02 01	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Glass	17 02 02	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Plastic	17 02 03	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Cables	17 04 10* or 17 04 11	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Insulation materials	17 06 01*, 17 06 03* or 17 06 04	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Construction materials containing asbestos	17 06 05*	TBC	On site	Dispose	Off site	Disposed to landfill by Specialist Demolition Contractor

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Gypsum/plasterboard	17 08 01* or 17 08 02	TBC	On site	Recycle	Off site	Salvaged for recycling where possible.
Main Earthworks						
Peat	Chapter 17	Approx. 0.5M m3	On site	Dispose	Off site	Temporary stockpiling along route to drain, used as landscaping material, as beneficial fill at waste water treatment ponds, disposal at Otaihanga landfill as landscaping material or alternative landfill site.
Sand	Chapter 17	TBC	On site	Reuse	On site	Cut to fill maximised to generate sand to be used as fill. Surplus material will be stockpiled for use by other adjacent NZTA projects
Usable soils/fill	Chapter 17	TBC	On site	Reuse	On site	Temporary stockpiling and reused on site
Top soil	Chapter 17	TBC	On site	Reuse	On site	Stripped and reused immediately
Contaminated soils	Chapter 17	TBC	On site	Dispose	Off site	Refer to Contaminated Soils and Groundwater Management Plan (CEMP Appendix K, Volume 4)
Pre-load surcharge aggregate	Chapter 18	TBC	On site	Reuse	On site	Surcharge reused as fill on site
Pavements						
Recycled Glass	N/A	TBC	From KCDC: Stockpiled at Landfill	Recycle	On site	Recycled in cycleway pavements
RAP and basecourse from removal of road sections	Chapter 17	TBC	On site	Recycle	On site	Use as fill where possible

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Loose chip from chip seal	Chapter 17	TBC	On site	Reuse	On site	Collected and reused on pavements where possible
Unused Asphalt	Chapter 17	TBC	On site	Recycle	Off site	Solidified asphalt crushed and recycled as fill on site, or recycled back into the manufacturing process - refer to Section 7.3 in the Plan
Concrete from on site pours (kerb & channel, guardrail posts)	To be categorised	small	On site	Dispose	Off site	Set and sent to landfill
Structures - Concrete Pours						
Concrete from PCY pours	To be categorised	TBC	Pre-Cast Yard (PCY)	Reuse	On site	Poured into molds to make channels etc
Concrete from on site pours	To be categorised	small	On site	Dispose	Off site	Set and sent to landfill
Metal forms for structures	To be categorised	TBC	PCY	Reuse	On site	Look to use forms from previous projects. Reused until end of job, recycled at end
Laminated Veneer Lumbar (LVL)	To be categorised	TBC	On site	Reuse	On site	Reused
Plywood Skin	To be categorised	TBC	On site	Reuse	On site	Reused until no longer possible, then sent to landfill
Wastewater containing concrete retarder	To be categorised	TBC	PCY and on site	Dispose	On site	Contained, treated and used in compaction/dust suppression
Rejected loads of concrete	To be categorised	TBC	On site	Recycle	Off site	Returned to concrete batching plant. Where possible use slurry as a fertilising additive, sludge for roading or foundation base-course, inter-lock blocks etc. - refer to Section 7.2 in the Plan

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Structures - Metals						
Steel reinforcing	To be categorised	TBC	PCY and on site	Recycle	Off site	Segregated at source
Steel strand/cables	To be categorised	TBC	PCY and on site	Recycle	Off site	Segregated at source
Grinding waste (carbon and steel filings)	To be categorised	TBC	PCY and on site	Recycle	Off site	Segregated at source
Structures - Piling						
Wastewater containing cuttings and either polymer or bentonite	To be categorised	TBC	On site	Recycle	On site	Wastewater used in compaction/dust suppressant. Estimated 10-12% per pile wastage in sludge form. Disposed of to landfill (sucker truck).
Bentonite	To be categorised	TBC	On site	Recycle	On site	Full recycle system used
Epoxy resin	Chapter 8	TBC	On site	Dispose	Off site	Excess left to set, sent to landfill
Grout	To be categorised	Approx. 4% of 1m3 per day	On site	Dispose	Off site	Left to set and sent to landfill
Pile spoil	To be categorised	TBC	On site	Dispose	Off site	Landfill
Drummous Oil (Water-soluble oil) used in post-tensioning activities	To be categorised	TBC	On site	Dispose	Off site	Collected and sucker trucked out for treatment and disposal
Structure Surface						
Epoxy paint/Anti-graffiti paint tins	To be categorised	TBC	On site	Recycle	Off site	Crushed and recycled

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Waste epoxy paint	To be categorised	TBC	On site	Dispose	Off site	Set and landfilled in tin
Vehicle Maintenance						
Grease	Chapter 13	TBC	Project Yard	Recycle	Off site	Segregated at source
Waste Oil	Chapter 13	TBC	Project Yard	Recycle	Off site	Segregated at source
Oil filters	16 01 07*	TBC	Project Yard	Recycle	Off site	Segregated at source
Tyres	16 01 03	TBC	Project Yard	Recycle	Off site	Segregated at source
Batteries/Accumulators	Chapter 16	TBC	Project Yard d	Recycle	Off site	Segregated at source
Other Construction Wastes						
Oil/Water separator sludge	Chapter 13	TBC	Project Yard /Site Yards	Recover	Off site	Sent for treatment
Solids from settlement ponds	19 08 13* or 19 08 14	TBC	Project Yard /Site Yards	Dispose	Off site	Landfill
Waste packaging – paper/card, hard/soft plastics	Chapter 15	TBC	Project Yard /Site Yards	Recycle	Off site	Recycled
Waste absorbents, rags and PPE	Chapter 15	TBC	Project Yard /Site Yards	Dispose	Off site	Landfill
Concrete barriers/forms from deconstruction elements e.g. SH1	Chapter 15	TBC	Project Yard /Site Yards	Recycle	On site	Crushed and reused as basecourse (where large quantities allow)
General mixed waste	General Waste	TBC	Project Yard /Site Yards	Dispose	Off site	Landfill
Septic Waste (portaloos)	NA	TBC	Site Yards	Dispose	Off site	Removal for disposal by sucker truck

Waste Type	Waste Code	Estimated Quantity	Location Generated	Disposal Route	On site/ Off site	How will this be achieved?
Office Waste						
Paper and cardboard	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Glass	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Metals	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Plastics	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Food waste	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Textiles	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Printer cartridges	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Fluorescent lights	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Batteries	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Waste electronic & electrical equipment	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
Aerosols	General Recyclables	N/A	Site Offices	Recycle	Off site	Segregated at source
General mixed waste	General Waste	N/A	Site Offices	Dispose	Off site	Landfill