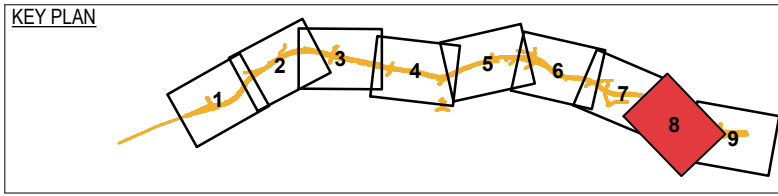




**Legend**  
 Refer to Overview Map

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Original Scale (A3)  
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| Revision | Amendment | Approved | Date     |
|----------|-----------|----------|----------|
| B        | AYF       | AH4      | 19/03/13 |
| A        | AYF       | AH4      | 27/03/12 |



|   |  |                       |
|---|--|-----------------------|
| Project: <b>MACKAYS TO PEKA PEKA EXPRESSWAY</b>   |  | Status:               |
| Title: Location of Construction Activities relative to Human Health and Nuisance Values |  | Document ID:          |
| Page 8 of 9   |  | Drawing No: EN-MP-002 |
|   |  | Rev. B                |

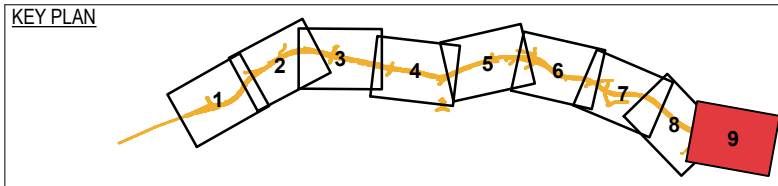
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**Legend**  
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| B        | AYF       | AH4      | 19/03/13 |
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|   |  |                       |
|---|--|-----------------------|
| Project: <b>MACKAYS TO PEKA PEKA EXPRESSWAY</b>   |  | Status:               |
| Title: Location of Construction Activities relative to Human Health and Nuisance Values |  | Document ID:          |
| Page 9 of 9   |  | Rev. B                |
|   |  | Drawing No: EN-MP-002 |

Appendix E

# Impacts and Aspects Register

# ENVIRONMENTAL RISK REGISTER

**CEMP** - Construction Environmental Management Plan  
**ESCP** - Erosion and Sediment Control Plans  
**EMT** - Environmental Management Team  
**EM** - Environmental Manager

**CM** - Construction Manager  
**SS** - Site Superintendent  
**PE** - Project Ecologist  
**PLA** - Project Landscape Architect

| Risk Ranking |              |               |               |  |   |
|--------------|--------------|---------------|---------------|--|---|
| Consequence  | Likelihood   |               |               |  |   |
|              |              | Probable (PR) | Possible (PO) | Improbable (IM)  |   |
|              | Minor (MI)   | Medium        | Low           | Low  | Minor – Low environmental impact that is short-term and can typically be remedied. Impact contained to operational area. Low risk of reputational effect on Alliance.   |
|              | Moderate(MO) | High          | Medium        | Low  | Moderate – Environmental effects which can be remediated or GWRC issuing of Abatement or Infringement Notices. Discharge off site/downstream occurs. Potential risk of media coverage and impact on reputation of Alliance. |
| Major (MA)   | High         | High          | Medium        | Major – Significant environmental effect resulting in costly restoration or prosecution under the RMA. Likely media coverage and impact on reputation of Alliance. |   |

| Issue   | Likelihood | Consequence | Risk   | Mitigation  | Further Reference  |
|---|------------|-------------|--------|---|--|
| Lack of environmental awareness   | PO         | MO          | Medium | Environmental site induction, toolbox meetings, environmental awareness training, specific training (external and internal), work plan procedures   | CEMP Section 5   |
| Untreated sediment discharge from work site                                   | PO         | MO          | Medium | Refer to the specific CESCPS for the works area and ensure controls listed are in place and as-built prior to commencing with works. Methodologies for the various activities as specified within the CESCSP need to be carefully followed and managed. The EMT will be responsible for the regular checking of all controls and audits. Checks to be undertaken prior to forecast heavy rain (25mm/hr) or before leaving the site for a number of days. All exposed areas of earth resulting from works to be stabilised as soon as practicable. All pumping from the earthworks activity is to be managed in accordance with pumping methodology provided and the "Permit to Pump" system. Prior to any earthworks within each sector occurring a new updated CESCSP is to be developed for certified by Council. | CEMP Section 8.4, ECSP, CESCPS                                 |
| Sediment tracking onto roads  | PO         | MI          | Low    | Vehicles to remain on stabilised access ways wherever possible. Maintenance of haul road. All entry and exit points from the site are via stabilised entrance ways and wheel wash can be installed if necessary. Monitoring of entry and exit points from the site and road sweeping if required.   | ESCP, CESCSP   |
| Cement/lime contamination of waterways during soil conditioning               | IM         | MA          | Medium | Correct dose used, occurs only during dry conditions, low-wind. Skirt on truck is to be used at all times. Ponds and receiving waters monitored for pH. Decants raised to prevent discharge. Lime ploughed into surface as soon as practicable. If spill occurs EM to be notified to investigate and prevention system in place to prevent discharge into waterways. Notification of nearby stakeholders maybe required.  | JESA   |
| Contaminated land and groundwater   | PO         | MO          | Medium | Ensure agreed protocols are adhered to in areas identified as contaminated. Dispose of contaminated material off site to approved disposal facility. Remove contaminated groundwater with sucker truck for off site disposal or pump to sewer with prior authorisation.   | Contaminated Soils and Groundwater Management Plan (CSGMP)     |
| Archaeological site disturbance   | PO         | MA          | High   | Areas of archaeological concern identified before construction. Archaeological investigation to be undertaken prior to works commencing. Accidental discovery protocol and History in Action DVD included in site induction. CM to notify EM and Archaeologist; who will inform NZ Historic Places and Tangata Whenua. Works to cease in the area and the site secured.   | CEMP Section 8.17  |
| Contamination due to works in and around watercourses                         | PO         | MA          | High   | Capture slurry and dispose to pit, skip bin or off-site. Use a wet-vac to capture slurry. Do not allow to enter natural waterways or storm water drains. Stone column / rip rap and bridge establishment methodology to be followed at all times. Culvert placement and any works within watercourses to follow methodologies which includes both structural and non structural control measures. Ensure timing of works is such that risk profile is reduced as much as possible by avoidance of high stream flows and where practicable avoidance of periods of fish spawning and migration.  | ESCP, CESP   |
| Non compliant construction noise  | PO         | MO          | Medium | Plan and carry out site operations in accordance with Construction Noise Management Plan and SSCNMP if appropriate. Ensure high risk noise areas are identified and communicated to work teams. Perform noise monitoring. Use noise barriers where appropriate if limits are likely to be exceeded. Advice from (external) noise mitigation specialists as required. Stakeholder Manager should be advised of all noisy and night works, and residents notified.  | Construction Noise and Vibration Management Plan (CNVMP), CEMP |
| Non compliant construction vibration  | PO         | MO          | Medium | Existing Condition Surveys of buildings close to works. Baseline monitoring. Monitoring as required during high risk construction activities. Alternative techniques or cease work if vibration exceeds limits. Selection of appropriate equipment and frequency/machinery speeds. Inform Stakeholders prior to construction with potential vibration effects. Education of residents regarding perceived vibration issues.   | CNVMP, CEMP  |
| Construction waste, general waste   | PO         | MI          | Low    | Waste to be separated at source where possible. Waste to be sorted according to type as detailed in the Resource Efficiency & Waste Management Plan (REWMP).  | REWMP  |
| Dust from construction activities   | PR         | MO          | High   | Wetting of any areas of concern, rapid stabilisation, limiting speed of traffic, keeping surfaces and structures clean, and regular road sweeping. SS and EM to plan site specific mitigation measures. Monitoring of works. EM to investigate complaints. Particular care taken at identified areas sensitive to dust. Stabilisation of haul roads and batter slopes using a combination of revegetation and hard fill - water supply also secured to ensure adequate supply for dust suppression. Undertaking works at times of the year when dust generation will be minimised - wetter periods.   | ESCP and CEMP  |
| Oil escape from hydraulic hose bursts   | PO         | MO          | Medium | Stop machine. Contain spill. Prevent discharge to waterways or storm water cesspits. Notify Environmental Manager. Initiate clean-up using spill equipment.   | Hazardous Substances Management Plan (HSMP), CEMP              |
| Spillage during refuelling of plant equipment                                 | PO         | MO          | Medium | Where possible refuel >10m from waterways using mobile refuelling plant. Operator must be present at all times. Avoid spills to water or ground. Report all spills to EM. Know where your closest spill kit is located.   | HSMP, CEMP   |
| Spill of other Hazardous substance to the land or waterways                   | PO         | MO          | Medium | Spill Procedure to be followed. Spill kits available across the site. Appropriate training given to all staff. Identify contaminant, stop source, protect receiving environment, contact EM, clean-up. Store hazardous substances in bunded area or appropriate storage container. All storage containers to be labelled.   | HSMP, CEMP   |
| Sediment discharge during dewatering (e.g. piles, trenches, peat replacement) | PO         | MO          | Medium | 'Permit to Pump' required with methodologies outlined and the way these are managed is through the permit system. All water treated prior to discharge. Sediment laden water discharged through grass buffer zone using flocculant filter socks, turkey nests, decanting earth bund or other sediment control as appropriate. Controls inspected before use and ongoing monitoring throughout. Water checked for hydrocarbons and other contaminants before discharge.  | ESCP, CEMP   |

|   |    |    |        |  |  |
|---|----|----|--------|--|--|
| Contamination of surrounding area during insitu concreting and grouting   | PO | MA | Medium | Isolation of work area from waterways. Collect and dispose of excess concrete to concrete washout (polythene lined skip or pit). All large volumes and concrete remaining in the bowl to be taken back to concrete yard. Spill kit available for use.  | CEMP   |
| Water way contamination due to washing vehicles and equipment   | IM | MI | Low    | Undertake vehicle washing at commercial washing facilities. Wash on pervious surfaces away from storm water cesspits and natural waterways.  | CEMP   |
| Contamination during tremi pile dewatering  | PO | MO | Medium | Water contaminated by concrete/bentonite during tremi pour to be contained and either treated or removed from site by sucker truck. Contact EM to agree treatment before pour.   | CEMP   |
| Damaging protected vegetation   | PO | MO | Medium | Refer to Landscape Management Plan. Trees to be protected are identified and marked prior to works starting. Site specific plans for works affecting the identified trees. Identified trees to be fenced with temporary fencing or safety mesh. Site smoko, temporary buildings, storage and equipment parking areas shall be outside of the tree dripline. Works within driplines to be supervised by EMT.  | Ecological and Landscape Management Plans (EMP, LMP) |
| pH altered water discharge as a result of flocculation  | IM | MO | Low    | Implement as per Chemical Treatment Plan. Bench testing indicates no impact on pH from polyacrylamide. ES responsible for system installation, operation and maintenance.  | ESCP and CEMP  |
| Disturbing sensitive areas due to storage of construction materials   | IM | MI | Low    | No storage of equipment or materials in wetlands. Locate stockpiles away from streams and overland flow paths. Install and maintain erosion and sediment controls in accordance with ESCPs. Inspect controls regularly.  | CESCPs   |
| Disturbing sensitive areas due to establishment of access and yards   | IM | MO | Low    | No works without Work Plan/ESCP approval. Minimise disturbance, especially for temporary works. Avoid machinery movements in this area where possible.   | CESCPs   |
| Image issues due to public complaint received   | PO | MI | Low    | Keep stakeholders informed of activities and maintain access wherever possible. Record complaint, appropriate person to investigate as per CEMP. Work with Stakeholder Manager to close out complaint.   | CEMP and Stakeholder Communications Plan             |
| Disturbance, sedimentation and turbidity in Waikanae River  | PO | MI | Medium | No works without CESCP approval. Minimise disturbance, especially for temporary works. Works in accordance with approved CESCP. Site specific work plans to be approved by EM. Triggered sedimentation and turbidity monitoring. Waikanae River. Refer Ecological Management Plan, ECSP and CEMP.  | CESCPs, ESCP, CEMP, Ecological Management Plan       |
| Wastewater from site  | IM | MO | Low    | Capture wastes using portable tank and vacuum sucker truck. Use portaloos. Connect to sewer with council approval.   | CEMP   |
| Settlement of buildings due to peat removal methodology   | PO | MA | High   | Confirm methodology to be undertaken through onsite trials. Pre condition building surveys undertaken at high risk locations. Settlement monitoring undertaking if deemed appropriate  | Settlement Monitoring Management Plan (SMMP)         |
| Settlement of the ground due to construction dewatering resulting in damage to buildings or services                              | PO | MA | High   | Baseline ground survey and groundwater monitoring. On-going monitoring as specified in the GWMP. Alternative techniques or mitigation if exceeds limits.   | Groundwater (Level) Management Plan (GWLMP)          |
| Adversely affecting the natural flow in surface water ways or wetlands due to dewatering activity.                                | PO | MA | High   | Baseline groundwater and surface water monitoring. On-going monitoring as specified in the GWMP. Alternative techniques or mitigation if exceeds limits.   | GWLMP  |
| Adversely affecting the natural flow in surface water ways or wetlands due to implementation of stormwater devices.               | PO | MO | Medium | Baseline groundwater and surface water monitoring. On-going monitoring as specified in the GWMP. Alternative techniques or mitigation if exceeds limits.   | GWMP   |
| Changes to direction and flow of groundwater, potentially altering contaminant migration paths [near Otaihangā Landfill]          | PO | MO | Medium | Baseline groundwater level and quality monitoring as specified in the GWLMP and CSGMP. Alternative techniques or mitigation if limits are exceeded   | CSGMP  |
| Changes to direction and flow of groundwater and drawdown of water table potentially affecting existing wells                     | PO | MI | Low    | Baseline groundwater and surface water monitoring. On-going monitoring as specified in the GWMP. Search of GWRC bore records identifies few bores that might be affected; should effects arise these can be addressed on a case by case basis.   | GWMP   |
| Unnecessary vegetation clearance of valued native and exotic vegetation during site establishment and land disturbance activities | IM | MA | Medium | Identification of vegetation to be retained, including and individual specimen trees, prior to site establishment works. Clearance boundaries to be identified and vegetation fenced. No land disturbance (including use of machinery) within dripline of trees or groups of vegetation. Where a deviation from an approved route or area cleared, the new area/route is to be checked by the PE and PLA.  | SSLMP, SSEMP   |
| Unnecessary vegetation clearance of valued wetlands during site establishment activities  | IM | MA | Medium | Prior to works the PE and PLA shall approve the physical extent of the wetland vegetation to be marked out for removal/protected. Clearance boundaries to be identified and taped or fenced. Where a deviation from an approved route or area cleared, the new area/route is to be checked by the PE and PLA.  | SSLMP, SSEMP   |
| Unnecessary riparian vegetation clearance during site establishment activities, culverting, bridge works.                         | PO | MO | Medium | There is an expectation of best endeavours to avoid existing riparian vegetation and aquatic systems wherever possible outside the construction footprint. In locations where these areas can be avoided or effects minimised, fencing or other markers will be established to demarcate the Projects/Construction Footprint boundary. Workers in these areas should be advised that the signage fence demarcates work boundaries that should not be breached.   | SSEMP, SSLMP   |
| Hydrological changes to wetlands from the preloading and peat compaction.   | PO | MA | High   | Monitoring of surface water levels and groundwater levels as outlined in the GWMP and reporting to the PE and EMT.   | EMP, LMP   |
| Ineffective planting works and pest plant control   | PO | MA | High   | Hold an on-site inception meeting with PE and PLA. Agree on hold points. Implement mulching, pest control and security, maintenance and reporting. Pest plants and weeds in wetlands are more invasive and require rigorous management.  | EMP, LMP   |
| Culverts and temporary stream diversions preventing fish passage  | IM | MA | Medium | Ensure the design of the culverts do not impair fish passage. Maintaining fish passage within all the drains and streams traversed by the Expressway Alignment is important to retain existing aquatic habitat and connectivity. To achieve this result will require detailed design and considerable care during construction, and in some cases, ongoing monitoring and maintenance.   | EMP, LMP   |
| Unnecessary damage to dune landforms and poor reshaping of modified dunes.  | PO | MO | Medium | Once engineering earthwork drawings are finalised, the Alliance (particularly the machine operators) and the Landscape Architect shall meet on-site to go through the drawings and discuss how to approach the earthworks within dune landscapes and in particular the reshaping. Hold points' should be identified and agreed to, in order for timely site visits by the Project Landscape Architect to monitor works before the next phase of activity commences. Communication between the site team and the Project Landscape Architect is necessary to ensure progress updates reflect coordinated site visits. | EMP, LMP   |

Appendix F

## Project Contact List

### Environmental Project Contact Details

| M2PP Alliance Team                   | Contact Person                 | Contact No.   | Email            |
|--------------------------------------|--------------------------------|---------------|------------------|
| Alliance Project Manager             | Alan Orange                    | 027 473 5900  | alano@fcc.co.nz  |
| Design Manager                       | Peter Bradshaw                 |               |                  |
| Consents Manager                     | Anna Lewis                     | 0272023260    |                  |
| Construction Manager                 |                                |               |                  |
| Southern Zone Manager                |                                |               |                  |
| Central Zone Manager                 |                                |               |                  |
| Northern Zone Manager                |                                |               |                  |
| Environmental Manager                | Kylie Eltham                   | 027 201 6383  | kyliee@fcc.co.nz |
| Environmental Specialist             |                                |               |                  |
| Environmental Officer                |                                |               |                  |
| Communications & Stakeholder Manager |                                |               |                  |
| Construction Liaison Officer         |                                |               |                  |
| Civil Works Superintendent           |                                |               |                  |
| Bridge Superintendent                |                                |               |                  |
|                                      |                                |               |                  |
| Project Consultants                  | Contact Person                 | Contact No.   | Email            |
| Project Archaeologist                | Mary                           |               |                  |
| Noise and Vibration consultant       | Marshall Day - Siiri Wilkining | 09 379 7822   |                  |
| Project Ecologist                    | Matiu Park                     | 027 488 45 02 |                  |
| Project Aborist                      |                                |               |                  |
| Contaminated Land Specialist Advisor | Genevieve Smith                | 09 300 9000   |                  |
| IWI                                  | Contact Person                 | Contact No.   | Email            |
|                                      |                                |               |                  |
|                                      |                                |               |                  |
|                                      |                                |               |                  |
|                                      |                                |               |                  |
| Other                                | Contact Person                 | Contact No.   | Email            |

| M2PP Alliance Team       | Contact Person          | Contact No.  | Email |
|--------------------------|-------------------------|--------------|-------|
| Historic Places Trust    | Central Regional Office | 04 494 8320  |       |
| GWRC - Pollution Control | Hotline (24 hours)      | 0800 496 734 |       |
| GWRC Compliance Officer  |                         |              |       |
| Spill Kit Provider       |                         |              |       |
| Vacuum Sucker Truck      |                         |              |       |
|                          |                         |              |       |



Appendix G

## Spill Procedure – ENV02

# ENV-02 FUEL, OIL AND CHEMICAL SPILLS (On Land and Water)

## A INTRODUCTION

### PURPOSE

This procedure describes the system for prevention, control, corrective action and reporting of fuel, oil and chemical spills on a project site.

### REFERENCES

Applicable Material Safety Data Sheets (MSDS)  
(available from FCC Intranet/Health and Safety (MSDS Online))

Resource consent requirements (if applicable)

### DEFINITIONS

**Oil** includes lubricants and machine oil and hydraulic fluid.

**Fuel** includes diesel and petrol.

**Chemicals** include thinners, anti-corrosion compounds, polymers, adhesives, form oil, retarders, curing agents, cement, pesticides and herbicides.

**The following documents are associated with this procedure:**

#### Standard Forms

Environmental Incident Investigation Report

Incident Register

Environmental Incident Witness Statement

## B PROCEDURE

| Activity                               | Responsibility  | Key Actions  | Records   | References            |
|--|---|--|---|-----------------------|
| <b>1. Preventive Measures</b>          | FCC Employees and Subcontractors  | <ul style="list-style-type: none"> <li>Implement and maintain the required preventive measures for handling, transferring and storing of oil, fuel and chemicals</li> </ul>  | Training and toolbox records                            | MSD sheets            |
| <b>2. Action in the Event of Spill</b> | FCC Employees and Subcontractors  | <ul style="list-style-type: none"> <li>Assess personal safety and explosion risk</li> <li>Stop operating machinery</li> <li>Turn off discharge valve and/or isolate source of spill</li> <li>Take whatever action is necessary to contain the spill and prevent it from spreading or discharging into a stormwater drain or cesspit, natural waterway or the sea (e.g. create a temporary earth bund)</li> <li>Notify Foreman/Supervisor</li> <li>Locate nearest spill kit (if available)</li> <li>Use absorbent booms, mats or 'kitty litter' to soak up the contamination</li> <li>If external assistance is necessary call the local provider of spill equipment or the Regional Council spill response unit</li> </ul> |   | Refer to Env. Toolkit |
| <b>3. Reporting Spills</b>             | <p>Project Engineer</p><br><p>Project Environmental Representative</p>                  | <ul style="list-style-type: none"> <li>Report spills using an Environmental Incident Investigation Report form</li> <li>Submit Incident Report to Project Manager and copy to Environmental Manager</li> <li>Log Incident Report on Register</li> <li>Immediately notify client's representative and Regional Council of any significant spill to land, stormwater system or natural watercourse</li> </ul>  | <p>Incident Investigation Report</p><br><p>Register</p> |                       |
| <b>4. Investigation</b>                | <p>Construction / Operations Manager</p><br><p>Project Environmental Representative</p> | <ul style="list-style-type: none"> <li>Request investigation report for spills having significant environmental impact</li> <li>Conduct investigation and prepare report</li> <li>Obtain witness statements where appropriate</li> </ul>   | Investigation Report<br>Witness Statement               |                       |

## C                    NOTES

### 1.0    PREVENTIVE MEASURES

The following measures are generic and each project should identify their site-specific/ resource consent requirements.

#### 1.1    ON WATER

##### 1.1.1    General

- All vessels used on water (dredges, runabouts, work boat, survey vessel and tugboat) are to be inspected regularly for fuel or oil leaks
- Vessels are to regularly cleaned to prevent the build up of oil and debris in the bilge
- All items of equipment used on or near water must have a cut-off control (automatic or manual) on the hydraulic and fuel tanks. Person refuelling must remain present at refuelling point - do not rely on cut-off controls.
- All staff working over water are to be trained in the use of spill kits
- Hold sufficient and suitable spill equipment for trapping and absorbing oil and fuel on each vessel

##### 1.1.2    Refuelling from a Work Boat

- A suitable fire extinguisher must be carried, fully charged and service check current
- Fuel transfer is only to be carried out by a member of the work boat crew who shall remain present at all times during this operation
- Work Boat to carry an adequate number of oil containment booms and spill mats
- An electric pump must be available to removed spilled diesel from the tank containment area
- Smoking is not permitted on the work boat or the vessel being refuelled

#### 1.2    ON LAND

##### 1.2.1    Fuel Storage (Diesel Transfer Tanks)

- Transfer tanks must be contained in a bunded area, or in a double shell construction, to contain diesel in the event of a leak/rupture of the tank
- Transfer tanks must be clearly labelled, vented and earthed
- Fuel storage areas must be made secure to minimise the potential for vandalism or theft.

##### 1.2.2    Fuel Transfer from Transfer Tanks to Fuel Truck and FCC Vehicles

- Fuel must only be transferred by a suitably trained operator who shall remain present at all times during this operation

- A spill kit must be held in the fuel truck
- The spill kit is to be periodically checked by the driver, reporting to the Foreman/Superintendent any items that need to be replaced or restocked
- Caution to be exercised when refuelling light vehicles. Preference shall be given to refuelling at points remote from any natural water or stormwater systems.
- No smoking permitted during refuelling

## 2.0 ACTION IN THE EVENT OF A SPILL (Fuel, Oil or Chemical)

### 2.1 Immediate Actions

- Assess safety of all personnel
- Assess risk of explosion
- Turn off the discharge valve or isolate the source of leakage or spill
- Stop operating machinery
- Take whatever immediate actions are required to contain the spill and prevent it spreading or discharging into stormwater drains, natural waterways or the sea as directed by the Foreman or Supervisor
- Notify Foreman or Supervisor
- Locate nearest spill kit
- On water; place boom around the spill and any downstream discharge pipes to prevent contamination from spreading. Place absorbent mats over the spill area
- On land; place absorbent mats on the spill and build temporary earth bunds if necessary
- If it is necessary to call in external assistance to a spill, call the local provider of spill equipment or the Regional Council spill response unit

### 2.2 Clean-Up Actions

- Use spill kit to soak up spill
- Foreman or Superintendent to notify Project Manager in event of significant spill
- On water; dispersants are only to be used under the direction of the Regional Council
- Used spill material is to be collected in heavy duty plastic bags and disposed of in an environmentally responsible manner (usually to landfill or hazardous waste collection facility)
- Appropriate training in the use of spill kits is to be provided for key personnel
- Notify Regional Council as appropriate
- If necessary contact a waste disposal contractor to remove spill residue to an authorised disposal facility.

### 2.3 Follow-Up Actions

Contaminated ground is to be examined by the Project Environmental Representative and Clients Representative, and remedial action implemented if required.

### 3.0 REPORTING SPILLS

All spills to land or natural waterways are to be reported using the Environmental Incident Investigation Report form.

A copy of the Incident Report is to be forwarded to the Project Manager and copied to the Environmental Manager.

The Incident Report is to be logged on the Environmental Incident Register by the Project Environmental Representative.

The client's representative and Regional Council is to be informed of any significant spill to land or to natural waterways (the sea, stormwater drains or open watercourses) by the Project Manager. Lines of communication with external parties are often stated in the project specifications.

### 4.0 INVESTIGATION

Following a spill having significant environmental impact the Environmental Manager requires an investigation report to be prepared by the Project Environmental Representative under the direction of the Project Manager.

Attach witness statements where appropriate.

Appendix H

# Construction Noise and Vibration Management Plan

Provided Separately



Appendix I

# Construction Air Quality Management Plan

Provided Separately

Appendix J

# Erosion and Sediment Control Plan

Provided Separately

Appendix K

# Groundwater (Level) Management Plan

Provided Separately

Appendix L

# Settlement Monitoring Management Plan

Provided Separately



Appendix M

# Contaminated Soils and Groundwater Management Plan

Provided Separately

Appendix N

# Hazardous Substances Management Plan

Provided Separately

Appendix O

# Ecological Management Plan

Provided Separately

Appendix P

# Landscape Management Plan

Provided Separately



Appendix Q


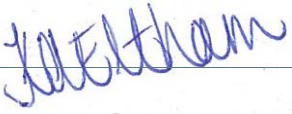
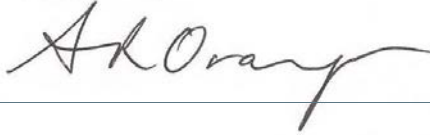
# Resource Efficiency and Waste Management Plan

# Resource Efficiency and Waste Management Plan (REWMP)

### 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 |
| 2.0         | Kylie Eltham    | Updated post BOI decision | 2/05/13  |
|             |                 |                           |          |
|             |                 |                           |          |

### Document Acceptance

| Action       | Name                                    | Signed   | Date     |
|--------------|---|--|----------|
| Prepared by  | Genevieve Smith                         |    | 11/11/11 |
| Reviewed by  | Kylie Eltham                            |    | 2/05/13  |
| Approved by  | Alliance Project Manager<br>Alan Orange |  | 2/05/13  |
| on behalf of | M2PP Alliance                           |  |          |

### For KCDC Information

| Action                      | Name                          | Signed | Date |
|-----------------------------|-------------------------------|--------|------|
| Regulatory Manager Approval | Andrew Guerin                 |        |      |
| on behalf of                | Kāpiti Coast District Council |        |      |

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## Appendices

### Appendix 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) for the construction phase of the MacKays to Peka Peka Expressway Project (“the Project”).

Large construction projects traditionally generate large quantities of waste materials with construction waste accounting for more than 30% of all landfill 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<sup>1</sup> 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 arising the Project construction; Actively promoting waste awareness through assigning responsibilities, training and staff engagement; and
- 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 throughout the course of the Project, to reflect material changes to construction methodologies or management practices to reduce waste.

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<sup>1</sup> 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: <ul style="list-style-type: none"> <li>■ Reduce negative impacts on land...; and</li> <li>■ Make more efficient use of resources, reduce the use of its non-renewable resources, and shift over time from non-renewable to renewable resources.</li> </ul>   |

| Title                             | Requirements and Objectives  |
|-----------------------------------|--|
| NZTA Environmental Policy         | <p>The policy includes using and managing resources efficiently:</p> <ul style="list-style-type: none"> <li>■ 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.</li> </ul> |
| The Alliance Environmental Policy | <p>We will manage our work to ensure we respect, preserve and enhance our environment. We will achieve this by:</p> <ul style="list-style-type: none"> <li>■ Reducing waste and preserving resources.</li> </ul>   |
| Regional/District Objectives      | <p>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.</p>   |

### 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). 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**

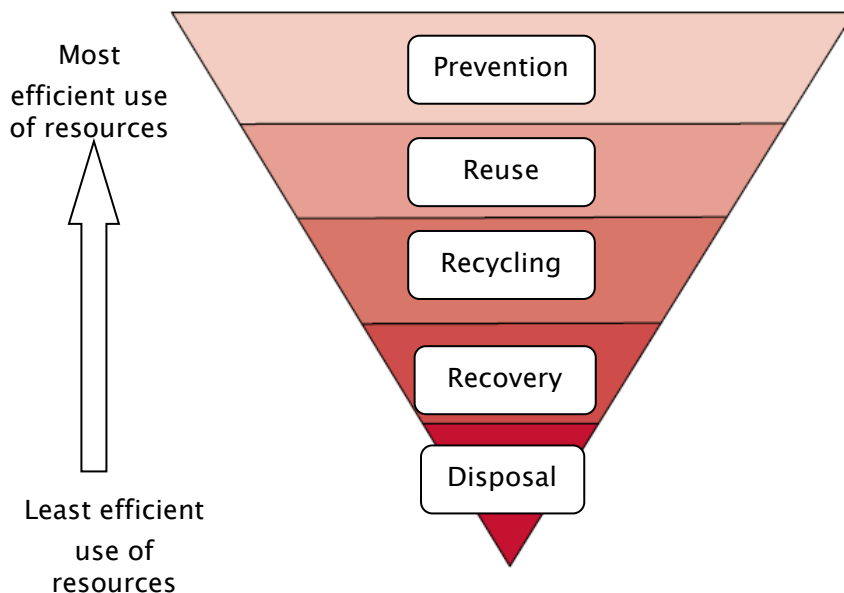
| Plan/Map   | Relevance   |
|--|---|
| Hazardous Substances Management Plan (HSMP)                | Storage, handling and disposal of hazardous substances.                                   |
| Contaminated Soils and Groundwater Management Plan (CSGMP) | Management of clean and contaminated soil and groundwater during construction activities. |
| Environmental Maps   | Receiving environments, sensitive receptors and construction yard location.               |

## 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**

The Alliance 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. 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 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. 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 potentially used during construction of the Project are listed within the HSMP.

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 MSDS 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. 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.
- Clearly identify bins with labels
- 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 for discharge control from stockpiles.
- Refer to the Construction Air Quality Management Plan 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 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<sub>2</sub>ST 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 the project Contact List in the Construction Environmental 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. Feedback from the monthly audits will be given at toolbox talks to encourage staff and drive behaviour change.

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 All members of the Alliance.

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. 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 the CEMP. 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.. Zone Managers and Foremen 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.

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.

Appendix A

# Waste Streams Management Register

| Waste Type                                    | Waste Code                  | Estimated Quantity | Location Generated | Disposal Route | On site/<br>Off site | How will this be achieved?  |
|---|-----------------------------|--------------------|--------------------|----------------|----------------------|---|
| <b>Ground Clearance</b>                       |                             |                    |                    |                |                      |   |
| 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     |
| <b>Demolition</b>                             |                             |                    |                    |                |                      |   |
| 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*<br>or 17 04<br>11 | TBC                | On site            | Recycle        | Off site             | Salvaged for recycling where possible.  |

| Waste Type                                 | Waste Code                                | Estimated Quantity | Location Generated | Disposal Route | On site/<br>Off site | How will this be achieved?  |
|--|---|--------------------|--------------------|----------------|----------------------|---|
| Insulation materials                       | 17 06 01*,<br>17 06 03*<br>or 17 06<br>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  |
| Gypsum/plasterboard                        | 17 08 01*<br>or 17 08<br>02               | TBC                | On site            | Recycle        | Off site             | Salvaged for recycling where possible.  |
| <b>Main Earthworks</b>                     |   |                    |                    |                |                      |   |
| Peat                                       | Chapter 17                                | Approx.<br>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   |

| Waste Type  | Waste Code        | Estimated Quantity | Location Generated                      | Disposal Route | On site/<br>Off site | How will this be achieved?  |
|---|-------------------|--------------------|---|----------------|----------------------|---|
| 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  |
| <b>Pavements</b>  |                   |                    |   |                |                      |   |
| Recycled Glass  | N/A               | TBC                | From KCDC:<br>Stockpiled at<br>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  |
| 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  |



| Waste Type                              | Waste Code        | Estimated Quantity | Location Generated  | Disposal Route | On site/<br>Off site | How will this be achieved?  |
|---|-------------------|--------------------|---------------------|----------------|----------------------|---|
| <b>Structures – Concrete Pours</b>      |                   |                    |                     |                |                      |   |
| 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 |
| <b>Structures – Metals</b>              |                   |                    |                     |                |                      |   |
| Steel reinforcing                       | To be categorised | TBC                | PCY and on site     | Recycle        | Off site             | Segregated at source  |

| Waste Type  | Waste Code        | Estimated Quantity                    | Location Generated | Disposal Route | On site/<br>Off site | How will this be achieved?  |
|---|-------------------|---------------------------------------|--------------------|----------------|----------------------|---|
| 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  |
| <b>Structures – Piling</b>  |                   |                                       |                    |                |                      |   |
| 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 1m <sup>3</sup> 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  |
| Drumless 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   |

| Waste Type                                       | Waste Code               | Estimated Quantity | Location Generated       | Disposal Route | On site/<br>Off site | How will this be achieved? |
|--|--------------------------|--------------------|--------------------------|----------------|----------------------|----------------------------|
| <b>Structure Surface</b>                         |                          |                    |                          |                |                      |                            |
| Epoxy paint/Anti-graffiti paint tins             | To be categorised        | TBC                | On site                  | Recycle        | Off site             | Crushed and recycled       |
| Waste epoxy paint                                | To be categorised        | TBC                | On site                  | Dispose        | Off site             | Set and landfilled in tin  |
| <b>Vehicle Maintenance</b>                       |                          |                    |                          |                |                      |                            |
| 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       |
| <b>Other Construction Wastes</b>                 |                          |                    |                          |                |                      |                            |
| Oil/Water separator sludge                       | Chapter 13               | TBC                | Project Yard /Site Yards | Recover        | Off site             | Sent for treatment         |
| Solids from settlement ponds                     | 19 08 13*<br>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 Type  | Waste Code          | Estimated Quantity | Location Generated       | Disposal Route | On site/<br>Off site | How will this be achieved?                                      |
|---|---------------------|--------------------|--------------------------|----------------|----------------------|---|
| 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 (portalos)                                       | NA                  | TBC                | Site Yards               | Dispose        | Off site             | Removal for disposal by sucker truck                            |
| <b>Office Waste</b>   |                     |                    |                          |                |                      |   |
| 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  |

| Waste Type                              | Waste Code          | Estimated Quantity | Location Generated | Disposal Route | On site/<br>Off site | How will this be achieved? |
|---|---------------------|--------------------|--------------------|----------------|----------------------|----------------------------|
| 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                   |

Appendix R

# Stakeholder and Communication Management Plan

Provided Separately

Appendix S

# Construction Traffic Management Plan



Provided Separately

Appendix T

# Environmental Incident Form

## ENVIRONMENTAL INCIDENT INVESTIGATION REPORT

### INCIDENT REPORT (PART 1) – to be completed by incident reporter

| PROJECT DETAILS   |            |         |
|---|------------|---------|
| Project:  | File:      |         |
| Project Location:   | Report No: |         |
| DETAILS OF INCIDENT   |            |         |
| Date of Incident:   | Time:      | am / pm |
| Incident Location:  |            |         |
| Weather conditions:   |            |         |
| What work was being carried out at time of incident?  |            |         |
| Briefly describe what happened, including what (if any) adverse impacts on the environment. Please take photos and attach to the report where the incident is considered significant:   |            |         |
| CORRECTIVE ACTION   |            |         |
| Describe what actions were taken to control the problem and mitigate adverse impacts on the environment:  |            |         |
| Who was notified?   | Date/Time  |         |
| <input type="radio"/> Project Manager<br><input type="radio"/> Construction Manager<br><input type="radio"/> Project Supervisor<br><input type="radio"/> Project Engineer<br><input type="radio"/> Project Environmental Manager / Representative<br><input type="radio"/> Entered into Job Safe<br><input type="radio"/> Regulatory Authority (who?) |            |         |

Report prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

## INCIDENT INVESTIGATION (PART 2) – in the event of a significant environmental incident, Part 2 of the form is to be completed by environmental representative or senior project representative

### CAUSE(S) OF INCIDENT

Speak with those involved to gain accurate information on the circumstances causing the incident.

In your opinion, which of the following elements contributed to the incident?

- Overall project planning** (e.g. no site Environmental Management Plan)
- Task planning** (e.g. not covered in task Works Plans or JSEA's)
- Communication** (e.g. person not made aware of environmental requirements)
- Deliberate action** (e.g. person aware of environmental requirements, but choose not to follow)
- Unforeseen issue** (e.g. could not have been reasonably foreseen or controlled in advance)
- Supervision – staff** (e.g. inadequate supervision or no clear instructions to person / team)
- Supervision – subcontractors** (e.g. inadequate supervision or no clear instructions of subcontractors)
- Training** (e.g. inadequate for the task, unfamiliar with environmental control methods required for the task)
- Time** (e.g. deemed inadequate to complete work while maintaining necessary environmental controls)
- External factors** (e.g. sabotage, vandalism)
- Procedures incorrect** (e.g. followed the work plan / JSEA procedures, but didn't work)
- Environmental equipment** (e.g. unsuitable for task, not available onsite, equipment failed)
- Site equipment\*\*** (e.g. arrived in poor condition, lack of checks, poor maintenance)
- Distraction** (e.g. not paying attention to the task)

Other:

- 
- 
- 

Elaborate on the causes listed above:

(\*\*please note if the equipment was sourced externally or from the Plant Yard)

### PROJECT ENVIRONMENTAL CONTROLS

Verify the following actions or procedures have been implemented on the project:

- Project Environmental Management Plan prepared & approved
- Environmental information included in Work Plans and JSEA's and discussed with the work teams
- Project meeting agendas include review of site environmental issues
- Toolbox talks include site environmental topics relevant to the tasks performed
- Project induction includes a section on project environmental procedures and controls
- There is adequate training for operators in environmental controls
- Site spill response plan is posted in office and lunchrooms and a fully stocked spill kit is on site
- Subcontractors are adequately briefed prior to work starts (as relevant)
- Regular site environmental inspections take place, are recorded and corrective actions closed out

| <b>PREVENTIVE ACTION</b>   |                 |                 |
|--|-----------------|-----------------|
| <b>SITE</b>  | <b>By whom?</b> | <b>By when?</b> |
| Considering causes of the incident and project environmental controls, what preventive action needs to be taken on this project site to prevent similar incidents? |                 |                 |
|  |                 |                 |
|  |                 |                 |
| Preventive action items closed out?  |                 |                 |
|  |                 |                 |
|  |                 |                 |
| <b>COMPANY</b>   |                 |                 |
| In your opinion, should the company consider further actions to prevent or reduce the likelihood of this incident occurring on other project sites?                |                 |                 |
|  |                 |                 |
|  |                 |                 |
| <b>SUMMARY:</b>  |                 |                 |
| Additional comment for issues not noted above:   |                 |                 |
|  |                 |                 |
|  |                 |                 |
|  |                 |                 |
|  |                 |                 |
|  |                 |                 |
|  |                 |                 |
|  |                 |                 |

Investigation completed by: \_\_\_\_\_ Date: \_\_\_\_\_

Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_

| <b>Attachments (list)</b> |
|---------------------------|
|                           |
|                           |

| <b>Copy (as appropriate)</b>  |
|---|
| <input type="checkbox"/> Project Manager<br><input type="checkbox"/> Construction Manager<br><input type="checkbox"/> Project Supervisor<br><input type="checkbox"/> Project Engineer<br><input type="checkbox"/> Project Environmental Manager / Representative<br><input type="checkbox"/> Regulatory Authority (as required, identify)<br><input type="checkbox"/> Client or Clients Representative (as required, identify)<br><input type="checkbox"/> Project File |

Appendix U

# Environmental Complaint Form

## COMPLAINT RECORD

|  |  |
|--|--|
| <b>Complaint No.</b>                             |  |
| <b>Complainant</b>                               |  |
| <b>Address</b>                                   |  |
| <b>Contact Details</b>                           |  |
| <b>Date/Time Received</b>                        |  |
| <b>Nature of Complaint</b>                       | <i>(add additional pages, sketches or photographs)</i> |
| <b>Location of works</b>                         |  |
| <b>Received By</b>                               |  |
| <b>Initial Response</b>                          |  |
| <b>Follow Up Response</b>                        |  |
| <b>Site Investigation/<br/>Corrective Action</b> |  |
| <b>Follow up/Feedback</b>                        |  |
| <b>Closed Out</b>                                | <b>By:</b> _____ <b>Date:</b> _____                    |

## COMPLAINT RECORD

|                              |   |
|------------------------------|---|
|                              |   |
| <p><b>Circulated to:</b></p> | <p> <input type="radio"/> Project Manager<br/> <input type="radio"/> Construction Manager<br/> <input type="radio"/> Zone Manager<br/> <input type="radio"/> Environmental Manager<br/> <input type="radio"/> Health &amp; Safety Manager<br/> <input type="radio"/> Traffic Manager<br/> <input type="radio"/> Other (detail)         </p> |
| <p><b>Attachments</b></p>    | <p><i>Detail eg photographs, sketches, emails</i></p>   |



Appendix V

# Contaminated Soils Management Plan (Human Health)

Provided Separately

Appendix W

# Network Utility Management Plan

Provided Separately

Appendix X

# Accidental Discovery Protocol

# Accidental Cultural Discovery Protocol

## 1. Purpose

The MacKay's to Peka Peka Alliance will be undertaking initial site works in preparation for the start of construction works in July 2013. Once construction starts, this Accidental Discovery Protocol will also cover all archaeological finds uncovered during earthworks.

This protocol outlines the steps to be taken in the event of the accidental discovery of cultural or historic artefacts, as the result of any physical disturbance to the existing ground surface.

## 2. The Historic Places Act 1993

An archaeological site is defined in the *Historic Places Act 1993* (the HPA) as any place associated with pre-1900 human activity, including shipwrecks, where there is evidence relating to the history of New Zealand that can be investigated using archaeological methods.

If any work that may affect an archaeological site is to be undertaken, an authority from the New Zealand Historic Places Trust (NZHPT) must be sought prior to works starting. This work could include, amongst other things:

- Invasive geotechnical investigations
- Earthworks for road construction
- Earthworks for relocation of buildings or structures, creation of accessways, etc.
- Earthworks for landscaping,
- Trenching for stormwater management, and waste disposal
- Quarrying, building demolition or removal.

It is an offence to do work that may affect an archaeological site without a written authority from the NZHPT.

## 3. Identifying Archaeological Sites

For Maori sites the largest and most obvious site types are pa, pits and terraces. However, evidence may be of a smaller nature, in the form of bones, shells, charcoal, burnt stone etc; a midden is an archaeological rubbish tip, in which many of these items can be found consolidated together. Evidence of disturbance of a midden can be a scattering of shell across a wide area; this can be confusing if it is near a beach. Pieces of obsidian or chert, together with stone tools, may also be recovered.

In later sites of European origin, artefacts such as bottle glass, iron/metal, crockery etc. may be found, or evidence of old foundations, wells, drains or similar structures. Burials/koiwi tangata may be found from any period.

Some examples include:

- Shell midden
- Discoloured soils indicating burning or cooking
- Animal bone

- Historic pottery on a roadside scrape
- Shell midden uncovered in road scraping

## 4. Procedures

Prior to construction work commencing, the field team shall be briefed on the likely nature of cultural and historic artefacts in the area, and on this procedure. Staff will also view the *History in Action* DVD which outlines the requirements of all staff in dealing with archaeological finds.

If any suspected archaeological material is uncovered, all work within 20m of the discovery shall stop immediately.

The Alliance, including any sub-consultants and sub-contractors, is required to keep confidential all discoveries.

The Alliance is responsible for on-site safety and may from time to time need to restrict access, for the safety of all parties.

The Cultural Adviser is responsible for ensuring all iwi groups are advised of the find and provided an opportunity to participate in decision-making.

In coordination with the Project Engineer, the Archaeologist shall conduct exploratory work to determine the nature of the find.

The Environmental Manager, in consultation with the Archaeologist, Cultural Adviser and Project Engineer shall coordinate the response as follows:

- a) If the event of the discovery of any Taonga artefacts or other signs of previous Maori presence or occupation, work with iwi representatives to ensure that the appropriate steps are taken to make the site safe.
- b) Decide where and when work can continue around the site.
- c) The archaeologist shall coordinate the appropriate consent process in accordance with the requirements of the Historic Places Act (1993). Works can proceed only after granting of an archaeological authority.
- d) Works affecting the archaeological site shall not resume until the New Zealand Historic Places Trust and iwi are satisfied that the site has been identified, the find recorded, and cultural protocols appropriately observed.

The Archaeologist and Cultural Adviser shall first liaise on all issues with the Environmental Manager, who will keep the other parties informed.

If any artefacts are removed from a find site, the Ministry for Culture and Heritage will be advised to ensure that the correct procedures under the *Protected Objects Act 1975* are adhered to.

Any media statements in relation to this protocol will be prepared with the assistance of iwi and only after discussions between the Alliance and iwi.

Archaeological finds in wetlands may include organic material preserved as a result of anaerobic conditions. Typically these remains are extremely fragile and susceptible to rapid decay in the event of any changes in environment, so usually require specialist attention. Finds can include (but are not limited to) wooden artefacts such as adze handles, weapons or horticultural implements and woven flax, or artefacts made from organic materials such as gourds.

Where wooden or organic artefacts are found in wetlands:

- a) Finds should remain, where possible, in-situ until professional advice has been obtained;
- b) In the event that items are inadvertently removed from their original context, the Project Engineer shall ensure the organic material is kept wet by being placed in a suitable storage container filled with water or kept damp with a wetted cloth/sack;
- c) Work in that location shall cease and the Archaeologist and Cultural Adviser shall be called;
- d) The Archaeologist shall obtain specialist conservation services and advice from an appropriate specialist, such as a wet wood conservator, to ensure the survival and appropriate conservation treatment of the artefact;
- e) The Ministry of Heritage and Culture will also be notified in accordance with the statutory requirements of the *Protected Objects Act 1975*; and

The Alliance shall be responsible for all transportation and conservation costs that may be incurred.

## 5. Koiwi Tangata/Human Remains

If Koiwi Tangata (human remains) are found, the Police must be involved in the first instance, to determine whether or not the location is a crime scene. Thereafter the Archaeologist and NZHPT will be involved to determine the archaeological context of the discovery. The Archaeologist will make a preliminary record of the state of the koiwi, including the site of discovery, and any other relevant facts and will make these records available to iwi and the police if required.

As soon as practicable after the Alliance has given notice to the appropriate iwi representatives that koiwi have been discovered, iwi representatives will inspect the site and advise the Alliance whether iwi wish to undertake any cultural ceremonies at the site. The Construction Manager in consultation with the Project Engineer will arrange access.

If iwi wish to undertake such ceremonies, the iwi representative will make the necessary arrangements for these ceremonies to occur at the site as soon as possible. Once these ceremonies are completed, the Archaeologist, in consultation with the Cultural Adviser and iwi representatives, will undertake a detailed investigation of the koiwi, if considered appropriate,

The Archaeologist will initiate discussions with iwi and the Alliance as to what will happen to the koiwi (do they remain in situ on the site, or are they in danger from the present activity and therefore all parties consider it safer culturally to remove them and rebury them elsewhere). If the koiwi are to be removed this must be undertaken by the Archaeologist who will record as much detail as possible. In some cases, and with discussion with iwi, the remains may be sent to Otago University for proper analysis.

If the discovery area is considered to be an archaeological site, approvals must be obtained from the New Zealand Historic Places Trust (NZHPT) to permit the detailed investigation and/or removal of koiwi. If the koiwi are Maori, and the police and/ or coroner have no uncertainty or suspicion about the koiwi, and the Archaeologist has undertaken the level of investigation they require, the iwi representatives will then gather up the koiwi and remove them from the site. In the event that the police and/ or coroner have any uncertainty or suspicion about the koiwi, they are responsible for making any records they require and for any koiwi that they remove from the site.



# IF IN DOUBT, STOP AND ASK

INFORM YOUR SUPERVISOR IMMEDIATELY

## 6. Tangata Whenua/Manawhenua

The Mackays to Peka Peka Expressway crosses the tribal jurisdiction of Ngati Toa Rangatira, Te Ati Awa ki Whakarongotai, Ngati Raukawa and Muaupoko; therefore in the event of an accidental discovery within any of the Expressway sectors the following iwi representatives will be contacted:

|                             |                  |                           |
|-----------------------------|------------------|---------------------------|
| Te Ati Awa ki Whakarongotai | Ben Ngaia        | 04 472 3872 021 0203 0299 |
| Takamore Trustees           | Ben Ngaia        | 04 472 3872 021 0203 0299 |
| Ngati Toa Rangatira         | Jenny Smeaton    | 04 238 4952               |
| Ngati Raukawa               | Te Waari Carkeek | 06 364 5121 027 667 4477  |
| Muaupoko                    | Steve Hirini     | 06 3673311 021651958      |

## 7. Alliance Contact Details

### Environmental Manager

Kylie Eltham

Mobile: 027 201 6383

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### Cultural Adviser

Amos Kamo

Phone: 09 359 5236

Mobile: 0 27 545 4293

E-mail: [amos.kamo@boffamiskell.co.nz](mailto:amos.kamo@boffamiskell.co.nz)

### Archaeologist

Mary O'Keefe

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Mobile: 027 440 3769

E-mail: [mary.okeeffe@paradise.net.nz](mailto:mary.okeeffe@paradise.net.nz)

## 8. Additional Contact Details

### New Zealand Historic Places Trust (NZHPT)

Kathryn Hurren  
Central Region Archaeologist/Kaihuakanga a Rohe  
NZ Historic Places Trust *Pouhere Taonga*  
PO Box 2629  
WELLINGTON 6140

Ph: 04 494 8324

Email: [khurren@historic.org.nz](mailto:khurren@historic.org.nz)

Anthony Tipene  
Maori Heritage Adviser (Central Region)  
N.Z. Historic Places Trust *Pouhere Taonga*

Phone: 04 802 0007  
Mobile: 027 246 3791

### Kapiti Police Station

Rimu Road  
Paraparaumu  
Kapiti 5032

Phone: 04 296 6800  
Fax: 04 296 6801

### Ministry for Culture and Heritage (MCH)

Liz Cotton  
Heritage Operations, Heritage Services Branch  
Phone: 0  
4 499 4229

## Accidental Discovery Procedures

| Artefact Find  | Koiwi Tangata/Human Remains Discovery  |
|--|--|
| Immediately stop work.   | Immediately stop work  |
| Cordon off area in 20m radius  | Cordon off area in 20m radius  |
| Supervisor to contact Environmental Manager and Project Engineer   | Supervisor to contact Environmental Manager and Project Engineer   |
| Environmental Manager contacts Archaeologist and Cultural Adviser.   | Environmental Manager contacts Kapiti Police Station, NZHPT, Archaeologist and Cultural Adviser.   |
| Cultural Adviser contacts all iwi representative groups.   | Cultural Adviser contacts all iwi representative groups.   |
| Archaeologist advises NZHPT and co-ordinates site inspection.  | Kapiti Police in coordination with the Coroner will analyse the remains to determine if it is a crime scene.   |
| Iwi representatives are provided the opportunity to inspect the site and advise on appropriate protocols to be followed                    | If the remains are not associated with a crime then the Archaeologist and iwi representatives will determine whether/how the remains will be reinterred. |
| If necessary the Alliance will apply for an authority to modify, damage or destroy archaeological sites under the Historic Places Act 1993 | Iwi representatives will be provided sufficient time to perform appropriate rituals and customary practices.   |
| The Archaeologist will contact the Ministry for Culture and Heritage if artefacts are removed from the find site.                          | The Archaeologist will contact the Ministry for Culture and Heritage if artefacts are removed from the find site.  |
| Work recommences once NZHPT and iwi are satisfied that correct procedures have been followed.  | Work recommences once NZHPT and iwi are satisfied that correct procedures have been followed.  |

Appendix Y

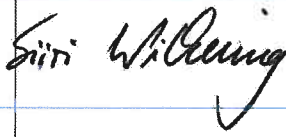

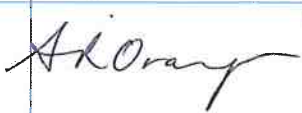
# Noise Monitoring Plan

# Noise Monitoring Plan (NMP)


### Noise Monitoring Plan (NMP) Revision History

| Revision N° | Prepared By                                 | Description                            | Date          |
|-------------|---|--|---------------|
| 1.0         | Siiri Wilkening<br>(Marshall Day Acoustics) | Draft for review                       | 13 March 2013 |
| 2.0         | Siiri Wilkening<br>(Marshall Day Acoustics) | Revision following meeting with M Hunt | 2 April 2013  |
| 3.0         | Siiri Wilkening<br>(Marshall Day Acoustics) | Amended Document Acceptance Table      | 3 April 2013  |

### Document Acceptance

| Action       | Name   | Signed   | Date       |
|--------------|--|--|------------|
| Prepared by  | Siiri Wilkening/<br>(Marshall Day Acoustics) |    | April 2013 |
| Reviewed by  | James Whitlock/Anna Lewis                    |   | April 2013 |
| Approved by  | Alan Orange<br>Alliance Project Manager      |  | April 2013 |
| on behalf of | M2PP Alliance                                |  |            |

### Council Review

| Action      | Name         | Signed   | Date       |
|-------------|--------------|--|------------|
| Reviewed by | Malcolm Hunt |  | April 2013 |

### Certification

| Action                      | Name                          | Signed   | Date           |
|-----------------------------|-------------------------------|--|----------------|
| Regulatory Manager Approval | Andrew Guerin                 |  | 26 August 2013 |
| on behalf of                | Kāpiti Coast District Council |  |                |

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## 1 Purpose

The purpose of this Noise Monitoring Plan (NMP) is to fulfil the requirements of the MacKays to Peka Peka Expressway designation condition DC.49.

This NMP confirms the locations, frequency and methodology of the operational noise monitoring.

The NMP ensures that the pre-construction noise level survey results encompass a sufficient distribution of locations along the alignment, e.g. low and high noise areas, areas where the Expressway will result in significant changes in noise level and where structural mitigation will be used to reduce noise levels.

The NMP also ensure that the post-construction noise level survey results are suitable for calibration and verification of the computer noise model.

Section 3 below outlines the frequency and methodology and Section 4 details the locations of the operational noise monitoring.

## 2 Notice of Requirement Conditions

This NMP has been prepared to fulfil the requirements of Designation Condition DC.49 of the MacKay's to Peka Peka Expressway Project, which states:

- a) ... *The Noise Monitoring Plan shall address the following:*
  - i) *The number and location of monitoring sites, including requirements that:*
    - A. *no more than 40% of monitoring sites shall be sites currently experiencing a moderate to high ambient sound level (i.e. more than 50 dB L<sub>Aeq(24h)</sub>) from existing sources; and*
    - B. *at least 40% of monitoring sites shall be sites currently experiencing a low ambient sound level ( $\leq 50$  dB L<sub>Aeq(24h)</sub>) but with a predicted significant increase in noise level due to the operation of the Project, and where mitigation of this noise relies on proposed barriers or bunds as identified in the Structural Noise Mitigation plans in the Traffic Noise Assessment, Technical Report 15;*
  - ii) *The timing and frequency of surveys. This will include a requirement that ambient sound level data from Technical Report 17 "Pre-Construction Sound Level Survey" shall only be used where the data has been collected not more than 24 months prior to the preparation of the Monitoring Plan, and shall only be data collected at "long term" sites;*
  - iii) *Methods and standards to be followed. This will include methods used to identify and remove measurement results for time periods affected by sound associated with any temporary events or activities (such as noise from construction activities), and during periods where wind speeds exceed 5 m/s or the rainfall rate exceeds 6 mm/hour; and*
  - iv) *Timeframes for reporting to the Council.*
- b) *The results of the noise level monitoring undertaken in accordance with Condition DC.49(a) above shall be used to verify the computer noise model of the Detailed Mitigation Options. A report describing the findings of the*



*verification shall be provided to the Manager within one month of the final monitoring being completed.*

### **3 Noise Monitoring Requirements**

#### **3.1 General**

Operational noise monitoring shall be undertaken in accordance with this NMP. Post-construction monitoring shall only commence once the Manager's written certification of the NMP has been received.

Noise monitoring shall be undertaken in accordance with the requirements of Section 5 of New Zealand Standard NZS6806:2010. This Section references New Zealand Standard NZS 6801. This means that it shall be undertaken:

- By, or under direct supervision of, a suitably qualified and experienced acoustician
- When road surfaces are dry
- During times of typical traffic volumes (e.g. not during school holidays, major road works, major accidents)
- At locations where measured noise levels will be controlled by road traffic noise (e.g. avoiding locations in the vicinity of active construction sites or industrial sites)
- During times when weather conditions are appropriate for environmental noise surveys (i.e. excluding times with wind speeds above 5 m/s and/or with rainfall exceeding 6 mm/h)
- Over a minimum contiguous period of 24 hours
- At a height of 1.2 to 1.5m above ground
- In line with the façade of a PPF
- At least 3 metres from any reflecting surface

#### **3.2 Instrumentation**

Instrumentation to be used for the survey shall be (in accordance with NZS6801:2008):

- A sound level meter or noise logger which complies with the relevant IEC specification, preferably type or class 1 (but at least type or class 2)
- Calibrated to the requirements of NZS6801:2008, Section 5.2

#### **3.3 Adjustments**

If measurements cannot be undertaken in accordance with 3.1 above, then measured levels will need to be adjusted by a suitably qualified acoustician. Adjustments may be made for:

- Influence of adverse weather conditions, specifically wind speeds above 5 m/s and rainfall of more than 6mm/h – by excluding these time periods from the calculated overall 24-hour noise level
- Influence of reflecting surfaces (e.g. buildings, fences) – by calculating the reflection contribution and subtracting this from the result
- Distance to the road edge (if surveys cannot be undertaken in line with the relevant façade) – by calculating the distance attenuation and adding/subtracting this from the result
- Change in traffic volume compared with the Design Year – by calculating the noise level correction due to the difference in traffic volumes at the measurement time

compared with the design year, and adding this to the result. For this to be calculated, traffic volume counts must be performed during the noise level survey

- Observed extraneous noise sources (e.g. lawnmower, harvesting machines) – if the duration of these activities can be determined with certainty, e.g. by being recorded by the resident, then these periods should be excluded from the calculated overall 24-hour noise level

Any adjustments applied must be documented (refer Section 8 below).

## 4 Noise Monitoring Locations

In accordance with DC.49(a)(i), monitoring shall be undertaken at sites that fulfil the following requirements:

- No more than 40% of the sites shall currently (pre-construction) experience noise levels above 50 dB  $L_{Aeq(24h)}$
- At least 40% of the sites shall currently (pre-construction) experience noise levels at or below 50 dB  $L_{Aeq(24h)}$ , receive significant increase in noise level due to the Expressway operation and rely on barriers/bunds as identified in the Structural Noise Mitigation Plans of Technical Report 15.

The above requirements ensure that a broad distribution of noise level survey locations is chosen. These locations would include low noise areas (away from existing noise sources) and high noise areas (close to local roads and SH1), those predicted to experience significant increases in noise level (e.g. in low noise areas and close to the Expressway alignment) and those where structural mitigation is used to reduce Expressway noise levels.

Pre-construction noise level surveys will be tested against these criteria to ensure that the requirements are fulfilled, and the results reported (refer Section 8 below).

Post-construction noise level survey locations shall be discussed with Council at least 6 months prior to monitoring occurring.

## 5 Timing and Frequency

Noise levels shall be measured at the following times:

- Pre-construction ambient noise levels: prior to construction commencing in the vicinity (this includes construction that may affect the measured noise levels)
- Post-construction traffic noise levels: 2-3 years following the opening of the Expressway, as a minimum, at the same positions measured in the pre-construction survey
- At those locations where the post-construction survey result is within 1 dB of the upper end of the relevant Criteria Category (refer Technical Report 15, Appendix B), a further post-construction survey shall be undertaken 8-10 years following the opening of the Expressway

## 6 Contingency Monitoring

Post-construction noise monitoring may be undertaken as a contingency at locations in addition to the pre-construction monitoring location.

This may be offered in the event of reasonable complaints, particular sensitivity of a location or other unforeseen circumstances. Should any additional monitoring be offered, this will be discussed with Council prior to implementation.

## 7 Use of Survey Results

The pre-construction survey results shall be used to confirm the noise effects of the project. This can be done by comparing pre- and post-construction noise survey results and assessing the noise level change against the categories of Technical Report 15, Table 6-2.

Pre-construction survey results shall also be tested against the requirements of DC.49(a)(i) described in Section 4 above.

The post-construction survey results shall be used to calibrate and verify the computer noise model of the completed Expressway.

Traffic noise levels ( $L_{Aeq(24h)}$ ) shall be predicted for each measurement location and compared with the measured level. If the difference between the measured and predicted noise levels is more than 2 decibels, the computer noise model shall be reviewed and revised for accuracy.

This process shall be documented and reported (refer Section 8 below).

## 8 Reporting

A report describing the monitoring results shall be prepared for each of the three monitoring rounds as follows:

- Pre-construction: monitoring results and comparison against the distribution requirements of DC.49(a)(i) and (ii)
- Post-construction (2-3 years following opening of the road): monitoring results and any findings from the computer noise analysis
- If required, post-construction (8-10 years following opening of the road): monitoring results and any findings from the computer noise analysis

The reports shall be submitted to Council within one month of completion.

Reporting of noise monitoring results shall include the following information:

- Instrumentation used for the survey, including manufacturer, type, serial number and confirmation that equipment held a current calibration certificate at the time of measurement
- Measurement details, including start and end date and time, and notes of controlling noise sources
- Location of the survey, including height of microphone, distance from road (for post-construction surveys), ground cover (e.g. grass, concrete), topography, any intervening structures between source and microphone where appropriate
- Meteorological conditions during measurement, including wind, rain, other conditions that may affect noise propagation, and weather station from where the weather data was obtained
- Adjustments, including for weather, reflection, traffic volume change and any other adjustments made