

Appendix K of the CEMP

# Contaminated Soils and Groundwater Management Plan

## Revision History

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A	Genevieve Smith	Draft for review	29/9/2011
B	Genevieve Smith	Draft following revisions	22/11/2011
C	Genevieve Smith	Draft for review	8/12/2011
D	Genevieve Smith	Draft for review	17/2/2012

## Document Acceptance

Action	Name	Signed	Date
Prepared by	Genevieve Smith		17/2/2012
Reviewed by	Kerry Laing		17/2/2012
Approved by	Graham Spargo		17/2/2012
on behalf of	Beca Infrastructure Ltd		

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## **1 Introduction**

### **1.1 Purpose**

This Contaminated Soils and Groundwater Management Plan (CSGMP) forms part of a comprehensive suite of environmental controls within the Construction Environmental Management Plan (CEMP) for the construction phase of the MacKays to Peka Peka Expressway (“the Project”). The CSGMP addresses the potential adverse environmental effects resulting from contaminated soil and groundwater at selected locations associated with the construction of the Project.

The principal purpose of this Plan is to highlight the minimum standards that must be complied with as well as best practicable options for management of contaminated soil and groundwater for the Project. It is intended as a guide for contractors on how to manage contaminated soil and groundwater at selected locations on site to minimise effects on health and safety and to reduce the impact on the environment.

The CSGMP will be updated, with the necessary approval, throughout the course of the Project to account for changes to construction techniques or the natural environment and consent conditions. A copy of any revisions of a material nature will be passed to Greater Wellington Regional Council (GWRC) for comment.

### **1.2 Scope**

The scope of this Plan is to:

- Detail the proposed contamination management strategy;
- Summarise contamination hotspots identified in Technical Report 23, Volume 3; and
- Identify appropriate control measures to minimise potential environmental and human health risks from soil and groundwater contamination associated with construction of the MacKays to Peka Peka Expressway.

### **1.3 Environmental performance standards**

The management of contaminated soils and groundwater during the Project shall follow the objectives of the CEMP, Volume 4 and be undertaken in accordance with the legislative requirements identified in Section 1.7 in the CEMP, Volume 4 and relevant conditions of consent or designation granted for the Project.

### **1.4 Environmental plans and maps**

This Plan has links to a number of other management plans which form the CEMP, Volume 4. A summary of the other management plans is included in Table 107.1.

**Table.1 - Relevant Environmental Management Plans and Maps**

Plan/map	Relevance	Location
Groundwater (Level) Management Plan (GWMP)	Monitoring and management of groundwater levels.	Appendix I of the CEMP, Volume 4
Hazardous Substances Management Plan (HSMP)	Spill management, storage and handling of hazardous substances to minimise contaminant discharges.	Appendix L of the CEMP, Volume 4
Erosion and Sediment Control Plan (ESCP)	Operation and maintenance of sediment retention devices for capture and treatment of sediment laden runoff from contaminated sites. Plan details monitoring of water quality.	Appendix H of the CEMP, Volume 4
Construction Air Quality Management Plan (CAQMP)	Implementation of dust control measures at contaminated sites and monitoring of air quality during construction.	Appendix G of the CEMP, Volume 4
Ecological Management Plan (EMP)	Monitoring of freshwater and marine ecology which could be affected by runoff from contaminated land.	Appendix M of the CEMP, Volume 4
Environmental Maps (GIS Layers)	Contaminated sites, construction footprint, Project Alignment, receiving environment.	Appendix C of the CEMP, Volume 4

## 2 Environmental impacts summary

### 2.1 Site identification

The route has been divided into sectors which broadly define the different urban and rural areas of the Project. The sectors are shown in Figure 7.5, Part D, Chapter 7, Volume 2 of the AEE.

### 2.2 Soils characterisation

A contamination assessment has been conducted at selected locations along the proposed route of the Project, the full findings of which are detailed in Technical Report 23, Volume 3.

Technical Report 23, Volume 3 concluded that soil contaminant concentrations exceeded health assessment criteria for construction workers and members of the general public at one site. Soil contaminant concentrations exceeded relevant environmental assessment criteria at each of the sites investigated.

Contamination management and monitoring will therefore be required for the Project.

The individual sampling locations at each site where contaminants pose a risk to human health or the environment are identified in the contamination risk register (Appendix K.A) described in the following section. The locations of confirmed contaminated sites along the route of the Expressway are listed in Table 107.2.

**Table.2: Contaminated Sites along the Route of the Expressway**

Sector	Contaminated Site Location	Type	Activity	Contaminants Identified
<b>2 (RAU-IHA)</b>	55 Rata Road	Contractors Yard	Historical storage of hydrocarbons	TPH, PAH
<b>2 (KAP-MAZ)</b>	Kāpiti Road Intersection	Unoccupied land	Unknown dumping of waste	Heavy metals
<b>3 (WAI-TEM)</b>	124-154 Te Moana Road	Horticulture	Market gardening	Heavy metals

Notes:

TPH – total petroleum hydrocarbons

PAH – polycyclic aromatic hydrocarbons.

### 3 Implementation and operation

#### 3.1 Management plan for areas of known contamination

The known locations of contaminated soil are illustrated on Drawings GIS-3320901-55, 61 and 62, Technical Report Appendices, Report 23, Volume 5. Reference to this will allow preliminary evaluation of material disposal options before such material is excavated.

##### Pre-excavation procedure

Prior to any earthworks being undertaken at a known contaminated site, a pre-earthworks site meeting will be held and attended by the Project staff including the Construction Manager, the Environmental Manager, the Contaminated Land Specialist (CLS) and personnel involved with the earthworks to discuss the risks and site procedures for handling contaminated soils and

groundwater and/or potentially contaminated soils and groundwater located along the route. The Construction Manager shall prepare a site specific Health & Safety Plan (CHSP) for the earthworks which shall cover exposure to contaminated soil, groundwater and dust for construction workers and the general public.

### **Risk register**

A contaminant risk register provides a record of the risk arising from chemical contaminants and the approach to managing the risk. For each contaminant the risk register records:

- A description of the contamination risk;
- An assessment of the consequences and likelihood of the risk occurring;
- A risk rating; and
- An outline of the controls required.

The risk register for contamination management along the route of the Expressway, based on chemical laboratory analysis data from soil sampling, is given in Appendix K.A. The contaminants of concern are: polycyclic aromatic hydrocarbons (PAH)/total petroleum hydrocarbons (TPH)/heavy metals.

### **Site induction**

All personnel working on the site during any intrusive ground works will be required to undergo a site environmental awareness induction in addition to the health and safety induction. Construction workers toolbox and tailgate meetings will include aspects of contamination control (soil, water and dust).

### **Erosion and sediment controls**

Erosion and sediment controls will be installed prior to earthworks commencing in accordance with Appendix H of the CEMP, Volume 4. The following additional measures will be required at contaminated sites:

- Where the construction of earth bunds is required for directing water flow, these shall be constructed from clean materials, either imported fill or using soils from outside of the contaminated site. Topsoil from contaminated sites shall not be used in bund construction.
- Where sediment retention ponds capture runoff and sediment from contaminated sites, the decant mechanism shall be raised to prevent immediate discharge.
- Water samples shall be collected and analysed for contaminants as detailed in the Contaminant Risk Register (Appendix K.A) for the relevant upstream contaminated site.

- Retained water shall not be discharged from retention ponds unless contaminants are confirmed by chemical laboratory analysis to be below ANZECC guideline values for the appropriate protection level for the receiving water.
- Contaminated water may require disposal at an appropriately licensed facility or to sewer with consent from Kāpiti Coast District Council (KCDC).
- Prior to the removal of sediment during maintenance of the sediment retention ponds, the sediment shall be tested for contaminants as detailed in the Contaminant Risk Register (Appendix K.A) for the relevant upstream contaminated site.
- Contaminated sediment shall be managed in the same manner as other contaminated soil, the procedure for which is detailed below.

### Excavation procedure

The CLS will be available on site during all excavation works in the areas identified as contaminated and will be responsible, based upon the demarcation of fill and natural ground, for defining which materials are cleanfill, contaminated fill or highly contaminated fill. At each contaminated site, the options for management of contaminated materials are as follows:

<u>55 Rata Road</u>	<ul style="list-style-type: none"> <li>■ Contaminated materials must be excavated for disposal at a licenced landfill.</li> </ul>
<u>Kāpiti Road Intersection</u>	<ul style="list-style-type: none"> <li>■ Contaminated materials may be reused on site if cement stabilised and in accordance with resource consent conditions.</li> <li>■ Contaminated materials may be excavated and reused at another location, in accordance with resource consent conditions.</li> <li>■ Contaminated materials may be excavated for disposal at a licenced landfill.</li> </ul>
<u>124-154 Te Moana Road</u>	<ul style="list-style-type: none"> <li>■ Contaminated materials may be reused on site if cement stabilised and in accordance with resource consent conditions.</li> <li>■ Contaminated materials may be excavated and reused at another location, in accordance with resource consent conditions.</li> <li>■ Contaminated materials may be excavated for disposal at a licenced landfill.</li> </ul>

If any contaminated material from any site is to be reused at another location or carted off-site to an appropriately licensed landfill, it must be loaded directly onto trucks and immediately dispatched.

The Environmental Manager or CLS will be responsible for compliance with all landfill disposal permit requirements prior to excavation works commencing.



The Project team<sup>1</sup> shall maintain daily records of where excavations have occurred; the type and volume of material excavated and where the material has been disposed of, stored or stockpiled; the quantity of material disposed to landfill and off-site weighbridge documents.

The Project team shall establish the following controls:

- Access to the excavation area shall be restricted to authorised personnel, following appropriate site induction procedures.
- The likelihood of encountering groundwater will be assessed and contingency action to manage groundwater will be developed.
- Stockpiling of excavated material, with appropriate erosion and sediment controls, shall be limited to confirmed cleanfill.
- Contaminated materials to be disposed of must be loaded directly into trucks for off-site disposal.
- Off-site material disposal must be to a facility licensed to accept such material.

#### **Contaminated dust controls**

Dust suppression controls will be rigorously implemented during earthworks at contaminated sites (in particular at 55 Rata Road) as detailed in Section 5.4 of Appendix H of the CEMP, Volume 4 and Section 3 of Appendix G of the CEMP, Volume 4. Controls include but are not limited to:

- Reduction of vehicle speeds.
- Minimising drop heights from loaders.
- Considering timing of works including prevalent wind direction.
- Regular watering of haul roads.
- Revegetating/stabilising exposed surfaces as soon as possible.

#### **Contaminated groundwater controls**

Locations TP215, TP216 and TP217 at 55 Rata Road have yet to be tested for soil contamination. Should the testing confirm that any contaminants at these locations may leach from the soils into groundwater during pre-loading of this area, the following controls could be implemented:

- Installation of trench stops to control and capture groundwater flow before it enters sediment retention ponds.
- Isolation of Drain 7 and northern tributary drain to capture contaminated groundwater.
- Analysis of water for contaminants as detailed in Contaminant Risk Register for this site prior to discharge.

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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.

- Pumping of contaminated groundwater from trench stops or isolated drain using a sucker truck and dispose at an appropriately licensed facility or to sewer with consent from KCDC.

### **Asbestos controls**

Risks arising from asbestos occur at localised areas within 55 Rata Road and Kāpiti Road Intersection. Excavations at these locations shall follow procedures detailed in this section of the plan and Section 3.2.

Should Asbestos Containing Material (ACM) be observed or suspected during the excavation works, all work shall cease and Guidelines for the Management and Removal of Asbestos (revised 1999) for the Department of Labour, and the Health & Safety in Employment (Asbestos) Regulations (1998) will be followed. Works can recommence once all ACM has been removed safely. Any such asbestos works (assessment, delineation, removal and verification) shall be undertaken by a specialist asbestos contractor.

### **Post-excavation procedure**

Upon completion of excavation works, all plant and equipment shall be cleaned and decontaminated prior to leaving the contaminated site. Water from wheel washes shall be collected and disposed of to sewer with consent from KCDC. Particular care should be taken when cleaning equipment used at locations TP209 and TP214 at 55 Rata Road given that the contaminants in the soil pose a risk to human health. Loose soil on equipment should be brushed off onto a tarpaulin and the soils transferred to the truck containing the contaminated soils being transported to landfill.

Any fill imported to reinstate the site shall be tested for an appropriate suite of contaminants to demonstrate that it is acceptable as cleanfill.

## **3.2 Contingency action plan for unexpected contamination and hazardous materials discovery**

This section outlines the steps to be taken if suspected contaminated soils or groundwater or hazardous materials are discovered during the wider excavation works. Contingency action will be similar to that for archaeological discovery (refer to the Project Accidental Discovery Protocol) and will be site specific and dependant on the extent and nature of the discovered contamination. The procedures outlined below provide the Project team with protocols to identify potential contamination and take appropriate action to avoid the dispersion of contaminants into the surrounding environment.

Contamination indicators or hazardous materials may include but are not limited to the following:

- Intact or broken drums and containers.
- Unusual odours.

- Discoloured or stained water seeps and soils.
- Petroleum hydrocarbon contaminated soil and/or free product.
- Liquid waste, putrescible waste, household refuse and any material that normally would be sent to a licensed landfill.
- Gas bubbles in standing/pooled water.
- Broken ACM sheets, pipes or fragments.
- Lack of, or stressed vegetation.

During the excavation works on site, the Environmental Management Team and CLS shall actively monitor for the conditions/materials specified above. In the event that one of these is identified, the Project team should take the following actions:

- Stop all earthworks within a 10m radius of the area where the suspect material/emission/discharge has been recorded.
- Immediately notify the site supervisor.
- Cordon off the area as practicable with a suitable barrier.
- Work shall not resume or commence within a 10m radius of the area unless authorised by the Environmental Manager and CLS.

The site supervisor shall contact the Environmental Manager who will advise on the appropriate course of action in consultation with the CLS. The CLS shall:

- Notify the regulatory authority (GWRC), if required, that contamination has been discovered and contingency action is being implemented.
- Characterise the contamination by collecting samples for chemical laboratory analysis.
- If appropriate, advise the Project team to excavate the suspected contaminated material into a covered bin to allow works to continue with minimum delay.
- If excavation into a covered bin is inappropriate, advise construction work to proceed to an area clear of contamination indicators until material testing, as necessary, defines the material characteristics.
- When the material characteristics have been established, advise the site supervisor as to whether the materials may remain on site or whether materials should be directly loaded into trucks for disposal at a licensed landfill, assuming it can be accepted without prior stabilisation.
- Instruct relevant staff so that all appropriate information such as location and quantity of material and off-site weighbridge dockets are recorded.
- Record all details on an incident form, including GPS of location.

### 3.2.1 Groundwater controls

General groundwater contamination controls (depending on the nature and scale of the problem) for discovery of unexpected contamination include the following:

- Monitoring of groundwater elevation, flow and quality;
- Installation of trench stops to control groundwater flow;
- Grouting of fractures (natural and construction related) to cut off groundwater flow;
- Construction of impermeable barriers such as clay (bentonite) cut-off walls or sheet piles (in locations discovered as being grossly contaminated) to prevent contaminants from entering excavations as required.
- Removal of groundwater from excavations by pumping and discharge into sucker truck or sewer. Permission will be required from KCDC for discharge to sewer.

Groundwater that is suspected of being contaminated and needs to be removed from the excavations may require disposal at an appropriately licensed facility. Chemical analysis of the groundwater will be required to determine its contamination status.

### 3.2.2 Stockpiling controls

Stockpiling of contaminated material should be avoided. If stockpiling of contaminated materials cannot be avoided, the following steps should be taken:

- Samples of the soil underneath the proposed stockpile area shall be collected for contamination testing to determine any baseline levels of contamination.
- The stockpiled material should be placed on plastic sheeting or similar to prevent contamination of underlying material.
- The stockpile shall be covered at all times to prevent dust and odour emissions and rainfall contact.
- A berm shall be installed around the stockpile to prevent runoff from leaving the area and stormwater from other areas entering the stockpile area.
- Stockpiles shall not be placed near drains or watercourses.
- At the end of the Project works, the area under the stockpile shall be reinstated.
- The soil underneath the stockpile areas shall be tested to verify that the stockpiling activities have not caused ground contamination.

## 4 Contamination testing and monitoring requirements

In order to determine the contamination status of materials removed from or remaining within a contaminated site, a monitoring programme is required. This will also allow assessment of the effects of disturbing and disposing of contaminated materials on the environment.

### 4.1 Soil contamination testing and monitoring requirements

Soil quality monitoring is required to cover three key aspects of the management of contaminated and potentially contaminated materials associated with the Project works, namely:

- *Verification testing*: targeted at the management of materials removed from site to a controlled/consented disposal site.
- *Validation testing*: targeted at documenting the concentrations of contaminants within the materials underlying the excavation works that remain in situ.
- *Discovery testing*: in response to “unknown” or unexpected contamination.

An explanation of the three types of testing is given below.

#### 4.1.1 Verification testing

Contaminated soil assessments have been undertaken to give an initial indication of the broad distribution of soil class within identified contaminated sites for each sector. Once the earthworks and materials requirements are finalised, further information on soil condition may need to be provided to the landfill operator prior to disposal of any contaminated soils.

#### 4.1.2 Validation testing

At any location where waste materials or contaminated soils are to be excavated, samples of material will be collected from the base and sides in proportion to the size of the excavated areas. The samples will be submitted for chemical characterisation according to the nature of the contamination as defined in the Contaminant Risk Register in Appendix K.A. This sampling and testing will provide information on any residual contamination of in situ soils underlying and surrounding the excavation works.

The testing of material being left in situ located at the subgrade layer may, in some locations, indicate that such materials are contaminated. It is noted that it is not intended that the works aim to remediate any such soils.

#### 4.1.3 Discovery testing

If during the excavation works “unexpected” or “unknown” contamination is encountered (refer to Section 3.2), additional chemical testing may be warranted. Such a decision will be made in consultation with the CLS. This response is analogous to that required for archaeological discovery.

## **4.2 Monitoring for consent compliance**

Where contaminated materials are being reused on site or at a different location, a discharge resource consent may be required in accordance with Rule 22 of the Regional Plan for the Discharges to Land for the Wellington Region, 1999 (Discharges to Land Plan). This will need to be confirmed with Greater Wellington Regional Council (GWRC). Consent conditions may require additional monitoring of discharges of contaminants at the originating site or disposal site (other than landfill). The definition of discharges in the Discharges to Land Plan includes:

- Leaching of contaminants into groundwater;
- Dispersing of contaminants into air; and
- Contaminants migrating through soil.

As the concentrations of contaminants at location TP209 at 55 Rata Road exceed the human health guideline values in the NES, activities at this site are likely to be restricted discretionary and the NZTA will need to apply to the Kāpiti Coast District Council (KCDC) for a resource consent under Regulation 10 of the NES. Consent conditions, including monitoring of discharges, would be imposed. The requirement for consent should be confirmed with KCDC.

## **4.3 Roles and responsibilities**

Section 3.1 of the CEMP, Volume 4 details the roles and responsibilities associated with managing the Project. Specifically the Environmental Manager and Construction Manager will take responsibility for the implementation of the CSGMP including training personnel in the required procedures, the coordination of monitoring work by contaminated sites specialists and decision making in the event of discovery of unexpected potentially contaminated material. The Environmental Manager is responsible for liaison with the GWRC.

A CLS will be engaged by the Project team to monitor, supervise and report on all works that may disturb contaminated land. Tasks include the following:

- Coordinate contaminated land assessments and testing;
- Advise on classification of excavated material for reuse and disposal;
- Coordinate contaminated groundwater management and disposal; and
- Train staff in contaminated land identification and control procedures.

## 4.4 Training

Environmental training for all staff will be undertaken as part of the site induction programme described in Section 3.3 of the CEMP, Volume 4.

## 4.5 Site validation report

At the end of the construction works, a Site Validation Report (SVR) will be prepared in general accordance with the *Contaminated Land Management guidelines: No.1*, Ministry for the Environment, 2001. The SVR will provide a summary of the activities undertaken to manage contaminated soils during the construction works, including documentation of excavation locations, disposal records, and testing and monitoring results. The SVR will also provide, where relevant, details on any contaminants remaining in situ including any proposed long term management measures.

## 5 CSGMP review

This section describes how the CSGMP will be reviewed, including looking at the environmental controls and procedures to make sure that they are still applicable to the activities being carried out

The CSGMP will be reviewed by the Project team after confirmation of the resource consent and designation conditions and will be revised in accordance with these conditions. The CSGMP 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. Approval from GWRC will be required for any relevant revisions of a material nature to the CSGMP, for which GWRC has jurisdiction.

A management review of the CSGMP will be undertaken at least annually by the Project Management team and the NZTA Environmental Representative. The management review will be organised by the Environmental Manager and the Project team will be informed of any changes to this plan through the regular Project communications processes. The review will take into consideration:

- Any significant changes to construction activities or methods.
- Key changes to roles and responsibilities within the Project.
- Changes in industry best practice standards or recommended pollution controls.
- 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, logs of incidents, corrective actions, and internal or external assessments.

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

## 6 References

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

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

Smith, G. Assessment of Land and Groundwater Contamination Effects: Technical Report 23, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.



Appendix K.A  
**Contaminant Risk Register**

**Risk Evaluation:**

<b>Likelihood of finding the contamination</b>	Likely or Unlikely
<b>Consequence</b>	Minor: Low harm to environment or human health
	Moderate: Some harm to environment or human health
	Major: Severe harm to environment or human health
<b>Risk</b>	Low, Medium, High

Sample Location	Soils					Likelihood of Finding the Contamination	Consequence	Risk	Mitigation Controls Required
	Exceeds Background	Exceeds Environmental Risk	Exceeds Human Health Risk	Exceeds Construction Worker Health Risk	Non-natural Materials				
<b>Sector 2 – (RAU-IHA) – 55 Rata Road, chainage 4900</b>									
<b>TP203</b>	As, Cd, Cr, Cu, Pb, Ni, Zn	No	No	No	Yes, ACM	Likely	Minor	Low	Asbestos Containing Material (ACM) to landfill. Reuse non-ACM on site or other site, or landfill. Resource consent required for reuse.
<b>TP204</b>	As, Cd, Cu, Pb, Ni	No	No	No	Yes, ACM	Likely	Minor	Low	Asbestos Containing Material (ACM) to landfill. Reuse non-ACM on site or other site, or landfill. Resource consent required for reuse.
<b>TP209</b>	Cd, Cr, Cu, Pb, Ni, PAH, TPH	PAH	PAH, TPH	PAH, TPH	Yes	Likely	Moderate	Medium	Remove to landfill.
<b>TP214</b>	PAH	PAH	No	No	Yes	Likely	Moderate	Medium	Remove to landfill.

**Sector 2 – (KAP-MAZ) – Kāpiti Road Intersection, chainage 6400-6800**

<b>TP108</b>	Cu, Pb	No	No	No	Yes, ACM	Likely	Minor	Low	Asbestos Containing Material (ACM) to landfill. Reuse non-ACM on site or other site, or landfill. Resource consent required for reuse.
<b>TP109</b>	As	As	No	No	No	Likely	Minor	Low	Cement stabilise and reuse on site or other site. Resource consent required. Alternatively dispose to landfill.

**Sector 3 – (WAI-TEM) – 124-154 Te Moana Road, chainage 11700-11800**

<b>HA125</b>	Zn	Zn	No	No	No	Likely	Minor	Low	Cement stabilise and reuse on site or other site. Resource consent required. Alternatively dispose to landfill.
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