WAKA KOTAHI NZ TRANSPORT AGENCY

Te Ahu a Turanga Manawatū Tararua Highway

Te Ahu a Turanga: Manawatū Tararua Highway

Contaminated Soil Management Plan: Unexpected Discovery of Contaminated Material

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Document History and Status

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A	17/02/2020	Dario Amidzic	Stephen Thomson	Damien McGahan	FINAL
Role		Contaminated Land Specialist	Suitably Qualified and Experienced Professional (SQEP) - Contaminated Land	Design Discipline Lead	
Signatures:					

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Glossary of Abbreviations

The following table sets out the abbreviations used within this document.

Abbreviation	Term
ACOP	Approved Code of Practice for the Management and Removal of Asbestos
ANZECC	Australian and New Zealand Environment Conservation Council
CH	Chainage
CLMG	Ministry for the Environment Contaminated Land Management Guidelines
CLP	Contaminated Land Practitioner
CSMP	Contaminated Site Management Plan
DSI	Detailed Site Investigation
ESCP	Erosion and Sediment Control Plan
HAIL	Hazardous Activities and Industries List
Km	Kilometres
m	Metres
MfE	Ministry for the Environment
NESCS	Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
PPE	Personal Protective Equipment
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
RMA	Resource Management Act 1991
SH2	State Highway 2
SH3	State Highway 3
SH57	State Highway 57
SSESCP	Site Specific Erosion and Sediment Control Plan
SUP	Shared Use Path
SQEP	Suitably Qualified and Experienced Practitioner

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1 Introduction

1.1 Overview

This Contaminated Site Management Plan (CSMP) has been prepared for the Te Ahu a Turanga: Manawatū Tararua Highway Project (the Project) being the construction, operation, use, maintenance and improvement of approximately 11.5 km of new State Highway connection between Ashhurst and Woodville to replace the indefinitely closed State Highway 3 (SH3) route through the Manawatū Gorge. The Project is described in more detail at Section 1.4.

A Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) were completed for the Project for the Project area. The DSI identified areas of soil contamination which will be remediated prior to construction of the Project; that work is outside the scope of this CSMP.

This CSMP provides the methodology and management measures that will be followed should any unexpected discovery of contamination occur during construction of the Project.

This CSMP has been prepared and certified by suitably qualified and experienced practitioners as required by Regulation 3 of the Resource Management National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (NESCS).

1.2 Purpose and Structure

This CSMP has been prepared on behalf of Te Ahu a Turanga: Manawatū Tararua Highway Alliance (the Alliance) to inform the earthworks contractor of the requirements in regard to the management of unexpected contaminated materials discovered during the earthworks.

The PSI and DSI that have been completed are based on known information from current and historic records, including investigations carried out specifically for the Project. Nevertheless, there is the potential for gaps in the data or for historical activities undertaken that were not documented that could have impacted soil quality elsewhere within the proposed Project area. Therefore, the CSMP sets out controls to be implemented if there is an unexpected discovery of contamination during the earthworks across the entire Project.

This document is comprised of the following sections:

- Section 2 sets out the background to the CSMP;
- Section 3 sets out the relevant legislative requirements;
- Section 4 provides the key personnel, roles and responsibilities of those implementing this CSMP;
- Section 5 provides protocols for unexpected discovery of contamination;
- Section 6 outlines the site management for the contaminated soil and water during earthworks;
- Section 7 addresses the use of imported fill; and
- Section 8 contains the health and safety procedures.

1.3 CSMP Review and updates

This CSMP is a live document that will be reviewed and updated as a result of a material change to address unforeseen adverse contamination effects arising from construction, or unresolved complaints.

1.4 Suitably Qualified and Experienced Practitioner

This CSMP has been prepared by Dario Amidzic and reviewed by Stephen Thomson. Stephen Thomson is a Principal Contaminated Land Scientist at WSP. Stephen has a Bachelor of Science Degree and Post Graduate Diploma in Physical Geography. Stephen has over 23 years' experience in the contaminated land industry, including considerable experience in undertaking investigations, managing, and reporting on contaminated land for public and private sector clients. Stephen prepares and reviews technical reports and is considered a Suitably Qualified and Experienced Practitioner (SQEP) under the NESCS.

2 Background

The PSI identified six potential areas of soil contamination, five of which were activities identified on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL). The sixth area comprised an organic hobby orchard which, while not classified as an activity on the HAIL, was identified as a potential area of contamination.

- **Site 1:** Chainage 9600 – 9750: Chemical storage and application of chemicals on livestock within the stockyard at 439 Saddle Rd, Ashhurst. HAIL Category A2.
- **Site 2:** Chainage 9750 – 9850: Woodville Closed Landfill – HAIL G3 (authentication parcel 7884). Note that the location of the landfill was assessed to be outside of the Project footprint. Due to the proximity this is considered to be HAIL H. Adjacent properties consist of HAIL Category G3.
- **Site 3:** Chainage 9950 – 10700: Fertiliser application within 159 Hope Rd, AgResearch property. HAIL Category A6.
- **Site 4:** Chainage 13000 – 13030: Small rural air-strip and fertiliser storage at 49807B State Highway 3, Woodville – Note that the fertiliser storage is considered to be HAIL Category A6. The wider air-strip operation is considered to be very minor and is not considered to be a HAIL.
- **Site 5**: Chainage 13600 – 13650: Former sheep-dip and stockyard – HAIL Category A8 (authentication parcel 22580).
- **Site 6**: The PSI also identified a hobby organic orchard at 1630 Napier Road that was not classified as an activity on the HAIL. However precautionary sampling was undertaken at the orchard during the DSI.

Each of these six identified areas were subject to sampling and analysis through the DSI. The results of the DSI identified that four areas contained levels of contamination that exceeded the adopted acceptance criteria for the protection of human health and or the regional background concentrations.

The DSI identified concentrations of arsenic in soils at the Saddle Road stockyards and the former sheep dip (Sites 1 and 5) that exceeded the adopted acceptance criteria for the protection of human health and/or the regional background concentrations. The sampling of the hobby orchard (Site 6) identified some shallow soil impacted with lead above background concentrations but below human health concentrations. Similarly, the small air-strip and the fertiliser storage (Site 4) identified some shallow soil impacted with cadmium and zinc above background concentrations but below human health concentrations.

These four areas (Site 1, 4, 5 and 6) are proposed to be remediated prior to the commencement of the land disturbing activities associated with the Project. The remediation will be carried out through excavation, transport and disposal of soil to a facility licensed to accept the material (i.e. Bonny Glen Landfill) in accordance with a Remedial Action Plan (RAP).

The remediation of these areas will be authorised by way of land use consents pursuant to the NESCS and will be sought from the relevant Territorial Authority. A discharge consent from Horizons is not considered to be required as no contaminants will be discharged to the environment during the remediation provided this CSMP, and the RAP for the remediation activities, is adhered to. Copies of the PSI, DSI and RAP can be provided upon request.

This CSMP provides the methodology and management measures that will be followed should any unexpected discovery of contamination occur during construction of the Project.

3 Legislative Requirements

Land use consent pursuant to the NESCS is being sought from the relevant territorial authority for the remediation of the known areas of contamination, and any unexpected discovery of contaminated soil within the Project area. The land use consent will be supported by the PSI, DSI and RAP, and can be provided on request, when available.

The PSI, DSI, and RAP were conducted and prepared in accordance with Contaminated Land Management Guidelines including:

- MfE, 2011, Contaminated Land Management Guidelines No. 1, Reporting on Contaminated Sites in New Zealand, ME No. 1071 (MfE 2011a);
- MfE, 2011, Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values (MfE 2011d)
- MfE, 2011, Contaminated Land Management Guidelines No. 5, Site Investigation and Analysis of Soils, ME No. 1073 (MfE 2011c);
- MfE, 2011, Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, SR 2011/361, October (NESCS);
- MfE, 2012, Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, ME 1092 (MfE 2012); and
- Health and Safety at Work (Asbestos) Regulations 2016;
- Worksafe New Zealand – Asbestos – New Zealand Guidelines for the management and removal of asbestos (3rd Edition), 2016 (Worksafe 2016). The following documents are designed to reflect the requirements of the Act and the Regulations as they apply to managing the health and safety risks of asbestos:
    - Approved Code of Practice for the Management and Removal of Asbestos (ACOP).
    - BRANZ (2017) New Zealand Guidelines for Assessing and Managing Asbestos in Soil.

This CSMP has been prepared in accordance with Contaminated Land Management Guidelines above, within the framework of the Resource Management Act 1991 (RMA).

3.1 Horizons Regional Council One Plan

The potential discharge of contaminants to the environment during accidental discovery of contaminated soil is a regional resource consent consideration. Therefore, the other applicable legalisation within the framework of the Resource Management Act 1991 (RMA) is the Horizons Regional Council One Plan (One Plan).

Chapter 14 of the One Plan sets out objectives, policies and rules for discharges to land and water. Rule 14-26, Rule 14-27 and Rule 14-28 are potentially applicable to the accidental discovery of contaminated soil and provide for:

- Rule 14-26: Discharges of contaminants to surface water.
- Rule 14-27 Discharges of contaminants onto or into land that will not enter water.
- Rule 14-28: Discharges of contaminants onto or into land that may enter water.

It is considered that Rule 14-28 is applicable and that with the implementation of the management methods set out in accordance with this CSMP, there will be no discharges of contaminants to the environment (other than sediment, for which resource consent is sought). Therefore, no resource consent pursuant to the One Plan is required for the accidental discovery of contaminated soil.

4 Key Personnel and Roles and Responsibilities

The key personnel responsible for the implementation of this CSMP are identified in Table 2. However, all site personnel are responsible for following the requirements of the CSMP.

Table 2: Plan implementation - Roles and Responsibilities

Name	Role	Contact details	Responsibility
	Alliance Project Manager		Responsible for all day to day operations on the project
Tony Adams	Construction Manager		Ensuring the Construction Environmental Advisor and the Zone Managers are aligned in their approach to ensuring environmental compliance
Lorraine Pennington	Construction Environmental Manager		Day to day implementation of the management and sub management plans onsite Onsite environmental compliance
	Communication and Engagement Advisor/Manager		Ensuring the requirements and compliance with the CSMP is communicated across all Alliance team members and wider stakeholders
Stephen Thomson	Contaminated Land Practitioner (CLP) / Suitably Qualified and Experienced Practitioner (SQEP)	stephen.thomson@wsp.com 029 3551425	Suitably qualified and experienced contamination consultant
Dario Amidzic	Contamination Specialist	Dario.amidzic@wsp.com 0274 981893	Contamination consultant
	Health and Safety Manager		Overall H&S responsibility of the Project and CSMP is adhered to.

5 Unexpected Discovery of Contamination

5.1 Overview

It is possible that unexpected contamination or hazardous materials could be discovered during the Project excavation works – including but not limited to the following:

- Intact or broken drums and containers.
- Soil materials with unusual odours.
- Indicators of coal tar, e.g. strong naphthalene (moth ball) odour and texture ranging from viscous tar to low density clinker rock.
- Discoloured or stained water seeps and soils.
- Hydrocarbon contaminated soil and/or free product.
- Liquid waste and any material that normally would be sent to a licensed landfill.
- Waste containers.

5.2 Unexpected Discovery Protocol

During land disturbance works, site workers will actively monitor works areas for the conditions/materials specified above. If newly discovered contaminated material is encountered, it must remain in situ until a SQEP has had the opportunity to assess and test the material. The excavation of the material prior to characterisation poses a risk of discharges to the environment and to human health.

In the event that potentially contaminated land is discovered, the following actions shall be taken:

1) Work in the immediate vicinity impacted by the material will cease.
2) The Construction Manager will contact the SQEP identified in Table 2.
3) Health and safety restrictions (in accordance with the Health and Safety Plan provided at Section 7) will be implemented including limiting access to the area, shutting down equipment to reduce potential ignition sources and moving workers to an upwind location. Establishing an exclusion zone around the area of potential contamination, clearly delineating, isolating and securing these areas as required. The location of the zone should be established by the Site Supervisor with input from the SQEP.
4) Any stormwater currently generated is to be directed away from the material, if this cannot be undertaken or stormwater is being generated from the material the material is to be covered (soil, tarpaulin etc).
5) The Contamination Specialist/SQEP will advise on the appropriate course of action. This may include the completion of additional soil testing. All sampling and testing shall be completed in general accordance with Contaminated Land Management Guidelines, No.5 – Site Investigation and Analysis of Soils, Ministry for the Environment (revised 2011, MfE 2011b).
6) The proposed course of action shall be undertaken in accordance with the Site Management Protocols outlined in Section 6.
7) The Construction Manager will notify (in writing) Horizons Regional Council (and if a HAIL activity, the appropriate Territorial Authority) of the identification and the proposed course of action recommended by the CLP/SQEP.
8) Work shall not resume unless authorised by the Construction Manager under advice of the CLP/SQEP.
9) Record all details on an incident form, including GPS of location, what steps were undertaken, and details of material encountered. If impacted material is to remain on site, the location and type of material observed, along with any analytical sampling results, shall be recorded for inclusion in a separate Site Validation Report.

10) If the SQEP considers it appropriate, the suspected contaminated material may be excavated into a covered bin to allow works to continue with minimum delay.
11) If excavation into a covered bin is inappropriate, construction work should proceed to an area clear of contamination indicators until material testing as necessary defines the material characteristics.
12) If unsuitable material is to be directly loaded into trucks for disposal at a licensed landfill, all appropriate information such as location, quantity and off-site weighbridge dockets must be recorded.

5.3 Contaminated Soil Definition

For the purposes of this CSMP and to assist with the management and disposal of any contaminated material unexpectedly discovered the following outlines the classifications of material. Regarding soil, there are three basic categories of contamination, which require different management protocols.

5.3.1 Cleanfill

It is expected that most materials within the proposed work site are of cleanfill quality. Cleanfill is defined as natural material such as clay, gravel, sand, soil and rock which has been excavated or quarried from areas that are not contaminated with manufactured chemicals or chemical residues as a result of industrial, commercial, mining or agricultural activities. It excludes:

- Hazardous substances and material (such as municipal solid waste) likely to create leachate by means of biological breakdown;
- Product and materials derived from hazardous waste treatment, stabilisation and disposal practices;
- Materials such as medical and veterinary waste, asbestos, and radioactive substances;
- Sulfidic ores and soils;
- Combustible components;
- More than 5% by volume of inert manufactured materials (e.g. concrete, brick, tiles); and
- More than 2% by volume of attached biodegradable material (e.g. vegetation).
- Cleanfill material can be disposed at a facility where cleanfill material is accepted, but excludes:
- Storage and use of cleanfill material within an earthworks site for the purpose of engineering contours for specific activities;
- Placement of cleanfill material associated with road construction and maintenance activities; and
- Onsite storage and use of overburden or aggregate by-product that is cleanfill material associated with mineral extraction activities.

5.3.2 Managed Fill

Managed fill comprises:

- Soil containing metal contaminants above regional background concentrations but below human health and ecological risk-based assessment/guideline values;
- Soil containing detectable concentrations of hydrocarbon compounds below risk assessment levels;
- Soil that does not contain hazardous substances or materials in the form of household and industrial waste, organic waste or asbestos containing material; and
- Soil that meets the acceptance criteria of an appropriately consented Managed Fill site.

5.3.3 Contaminated Soil

Contaminated fill in the context of this CSMP constitutes:

- Hazardous materials in the form of household and industrial waste, organic waste or asbestos containing material; and
- Soil with contamination present above human health and/or environmental guideline values that cannot be accepted at a managed fill/cleanfill site;
- Soil with contamination levels above managed fill waste acceptance criteria.

5.4 Asbestos

Should asbestos be observed or suspected during the land disturbance works, all work shall cease in the immediate vicinity, and a SQEP will be engaged to review site conditions and provide guidance as to how to proceed. Depending on the volume of asbestos discovered or whether it is friable, additional support may be required by a qualified and experienced asbestos assessor.

The following regulations and guidelines should be followed with respect to asbestos management:

- Health and Safety at Work (Asbestos) Regulations 2016.
- New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ 2017).

Works can recommence once asbestos has been appropriately managed/safely removed as advised by the asbestos professional.

6 Site Management Protocol

This section provides the measures required to protect human health and the environment during construction work, should unexpected contamination be discovered in accordance with Step 6 of the Unexpected Discovery of Contamination Protocol provided in Section 4.2.

The measures and controls will:

- Minimise worker and public contact with contaminated soil and groundwater;
- Ensure that waste soil and groundwater are appropriately managed;
- Minimise the potential for excavated material to be spread on the surface or migrate from the Project corridor through implementation of dust and erosion control measures;
- Minimise risk to local sensitive environmental receptors.

6.1 Water Management

The Contractor is to ensure that no liquid passes from the site of the potentially contaminated material except to an appropriate and approved receptor.

6.1.1 Stormwater

Separation and diversion of clean stormwater away from areas of ground disturbance is standard practice for any earthworks activity but becomes more important where contaminants are present.

To minimise the potential for clean stormwater to encounter contaminated soil, stormwater controls will need to be put in place to ensure stormwater does not come into contact with the impacted material. The material should be covered, with clean spoil or tarpaulins, until stormwater controls can be put in place. The impacted material cannot be excavated without prior approval from the Construction Manager, with guidance from the SQEP.

The stormwater and sediment controls measures put in place should be undertaken to ensure they comply with the requirements of the Site-Specific Erosion and Sediment Control Plan (SSESCP).

Where stormwater run-off or rainfall intercepts the exclusion zone, this water will be considered potentially contaminated and shall be captured in lined stormwater ponds until tested and proven otherwise. Where sampling has been undertaken and results show compliance with the Australian and New Zealand Environment Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (2000) (ANZECC, 2000), this water will be discharged to a surface water body. All run-off water that has encountered potentially contaminated soil and is deemed to be contaminated will be disposed of via a licensed liquid waste contractor.

6.1.2 Groundwater

Any groundwater that is encountered within an area identified as potentially contaminated, will be considered potentially contaminated until otherwise tested.

All groundwater encountered will be captured and will either be disposed of via a licensed liquid waste contractor or, where sampling has been undertaken and results show compliance with the Australian and New Zealand Environment Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (2000) (ANZECC, 2000), discharged to a surface water body.

6.2 Dust and Odour Control

Contaminated dust presents a potential risk to human health and ecological receptors. Dust must be minimised in accordance with the Project Dust Control Procedure contained within the wider Project Erosion and Sediment Control Plan (ESCP). Should contaminated soil be discovered and require removal, the soil, including stockpiled soil, will be kept adequately wetted to minimise dust. Stockpiles

will be dampened, and material will not be added or removed from stockpiles during high wind events. Note that stockpiles are only allowed for short durations (half a day).

In the event of accidental discovery of odorous contaminated materials (such as degrading hydrocarbons), it may be necessary to replace cover material over the contaminated materials to reduce odour and to excavate in a manner that exposes a small area at a time, allows it to ventilate, then exposes another small area, and so on.

6.3 Excavated Soil Management

Where contaminated soil is determined to be present, to the extent practicable, the following actions should be taken:

- Where possible excavated soil shall be placed directly into a truck for off-site disposal. Stockpiling of contaminated soil shall be avoided and is only allowed for short duration (half a day) and during fine weather.
- Spillages of soil during placement in trucks shall be cleaned up as soon as practicable following the spillage. Spillages shall not be left unattended as contaminated soil could be trafficked by trucks and transported off-site; and
- The CLP or SQEP shall be onsite during the excavation of contaminated material.

6.3.1 Transportation of Soil

The following measures shall be implemented to prevent contaminated soils (including any potentially contaminated material) from being dispersed onto roads or transported to another site (excluding transport to a disposal facility) as well as to minimise generation of dust:

- Trucks will be loaded where runoff and possible spills/dust during loading will be controlled and contained. Trucks will have their wheels either swept down or washed before they leave site. This activity will be undertaken just prior to the truck exiting the site.
- Excess soil shall be removed from vehicles and plant before they leave the works area;
- All trucks transporting contaminated soil to the selected disposal facility shall be covered to prevent the spillage of soil and dust emissions; and
- If sampling or site observations indicate the presence of asbestos, then additional controls (refer Section 9) will be required for the disturbance of asbestos contaminated fill material.

6.3.2 Earthworks Documentation

The Council may require the Consent Holder to demonstrate that the proposed earthworks have been undertaken with the agreed procedures and in compliance with the CSMP.

To assist with this, all correspondence with relevant Project stakeholders should be recorded and logged. The Contractor shall maintain a complete record of earthworks undertaken on site. This should include but not be limited to:

- Location of earthworks;
- Type and volume of material excavated;
- Location of temporary stockpile (if stockpiled);
- Record of sampling undertaken and laboratory results;
- Any fill that has been retained on site;
- Final disposal location (if off-site) with supporting haulage dockets and disposal certificates; and
- Any further validation sampling and testing of soils remaining on site (if required).

6.4 Spill Response – Hazardous Materials

In addition to providing and maintaining an adequate quantity of spill response kits, each Contractor operating within the Project corridor will be required to prepare and follow an emergency spill response plan that addresses stopping the spillage, containing the spill, clearing the area, calling for assistance, cleaning up the spill, and reporting the spill.

7 Sampling and Classification of Imported Fill to Site

Any material that will be required to be imported for the Project to complete the subgrade is to be sourced from clean quarry. Material sourced from a quarry that is extracting natural virgin material does not require testing. If material is sourced from a different source, then the supplier must provide evidence that the material has been tested to confirm that it is not contaminated above

background standards. Evidence may include a specific PSI and/or DSI for the site the material has been sourced from or additional testing that confirms the material is not contaminated. The documentation needs to be supplied to and approved by the SQEP prior to any material being transported to site.

8 Health and Safety

8.1 Overview

This CSMP provides procedures for site personnel working in and around contaminated and/or potentially contaminated soil and water during the excavation works. The following is designed to dovetail with the Construction Health and Safety Management Plan. The Health and Safety Manager will be responsible for ensuring these procedures are implemented.

The procedures have been developed to provide a framework for managing contamination related effects at the site. However, these procedures are not intended to relieve the owner or controller of the place of work of either their responsibility for the health and safety of their workers, contractors and the public, or their responsibility for the protection of the environment.

All parties working on the Project shall comply with:

- Applicable parts of the Project Health and Safety Policy;
- Construction Health and Safety Management Plan;
- Any requirements of WorkSafe New Zealand;
- The Health and Safety at Work Act 2016 and Regulations (incl Asbestos Regulations); and
- Any other applicable legislation, regulations, codes and guidelines.

Sub-contractors engaged on the Project are required to provide their own Health and Safety Plan for their equipment and workers.

8.2 Site Inductions

The provisions of this CSMP shall be outlined to all parties during the site health and safety induction and acknowledged formally as part of the works (i.e. signed project induction register) prior to personnel being allowed on site.

8.3 Daily toolbox Hazard Identification

Daily toolbox meetings shall include hazard identification for the proposed daily activities. A risk-based approach should be applied to the management of all hazards. Once a hazard is identified, it should be assessed to determine its level of risk and consideration should be made of the potential consequence of the harm and its likelihood for occurrence. Once the hazard has been assessed, reasonably practicable steps should be taken to control the hazard applying the following hierarchy of controls. The hazard board and review of controls should be completed daily in toolbox talks.

8.3.1 Control Measures

When considering hazard and risk controls, the hierarchy listed below will be followed, in preference from one to five. Example questions are provided to illustrate each step.

1. ELIMINATION – does the task that creates the hazard need to be performed?
2. SUBSTITUTION – can a different tool be used?
3. ENGINEERING – can the hazard be guarded to protect people?
4. ADMINISTRATION – are there warning signs and a procedure to address the hazard? Administrative controls include procedures to reduce the risks associated with identified hazards. These controls include:
   a) Job Safety Analysis (JSA) or Task Analysis.
   b) Work plans.
   c) Training.
   d) Warning signs.
   e) Communication with the Site Manager/Health and Safety Officer.

5. PERSONAL PROTECTIVE EQUIPMENT (PPE) – is the appropriate PPE being used? The following is noted:
   a) PPE is considered the lowest level of protection against a hazard.
   b) No single combination of protective equipment and clothing can provide protection against all hazards; PPE should be used in conjunction with other protective methods.
   c) The types of PPE will depend on the specific task undertaken. However, certain PPE is required in all work areas.

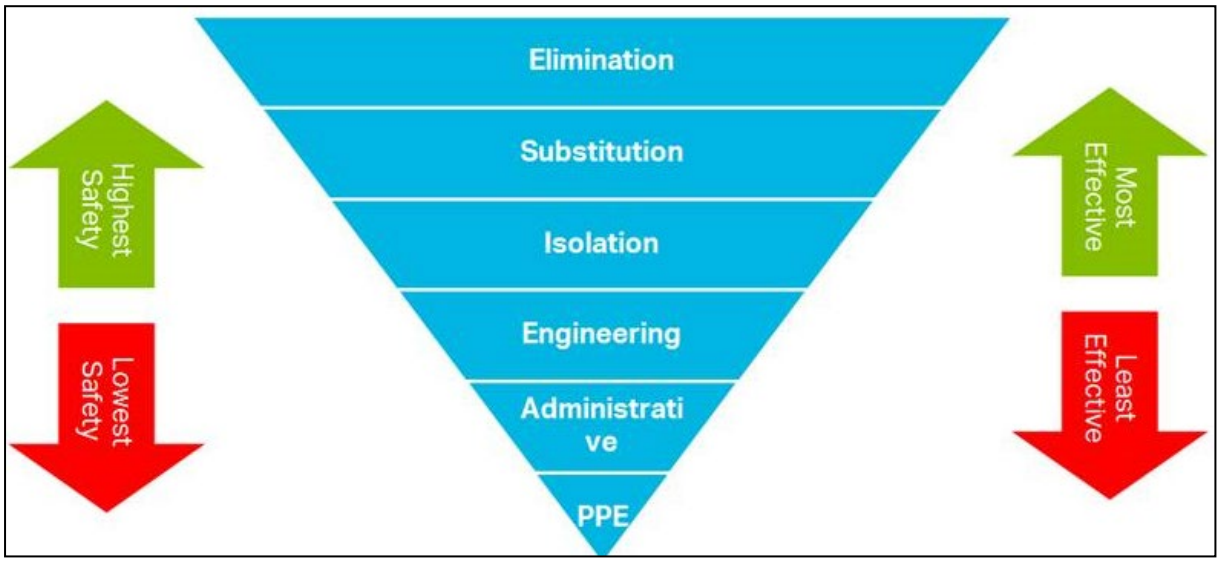

Figure 6-1: Hazard hierarchy

8.4 Personal Protective Equipment

The minimum PPE required for all persons engaged in any activities that may result in potential exposure to contaminated soil or water materials includes:

- Nitrile gloves/leather gloves/PVC Palm or otherwise as appropriate to the task.
- Safety boots (ankle high, steel capped with non-slip durable soles).
- Hard hat.
- Safety glasses.
- Long sleeved shirts and long pants or coveralls.
- The following additional PPE will be made available if required:
- Dust masks.
- Half face respirators fitted with organic and particulate vapour cartridges.

8.5 Personal Decontamination

If contaminated land is discovered and is required to be removed, a personnel decontamination station will be provided during land disturbance works. This will include a space to remove and store potentially contaminated clothing and hand washing facilities.

A ‘clean zone’ will be provided for site workers to eat, drink, and smoke. Workers will be advised not eat, drink, or smoke outside the clean zone during the completion of land disturbance activities.

Staff must wash their face and hands at the completion of land disturbance activities and prior to eating, drinking, or smoking.

8.6 Emergency Response

In the event that an emergency arises, or a potentially dangerous situation is encountered during remediation, or any suspect/unknown material is identified, work in the immediate vicinity is to cease immediately, and the matter reported to the Construction Environmental Manager for immediate assessment and action. An emergency will include, but not be limited to:

- When any personnel are involved in an accident or experience adverse symptoms of exposure while on-site;
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated and that the appropriate safety equipment is not available.

The following procedures will be employed by the key personnel identified in Section 6 in potentially hazardous areas:

- In the event that any personnel experience any adverse symptoms of exposure whilst on-site, work will be halted, and instruction or assistance sought from the Construction Manager;
- In the event of an accident, the Site Supervisor and the injured person will compile an incident report, which will be submitted to the Health and Safety Manager within 24 hours of the incident. Follow-up actions will be carried out to correct situation;
- In the event that an emergency situation arises, the Site Supervisor must address the problem and notify the ambulance, fire service and police if necessary. In addition, the Construction Manager must be notified immediately;
- To minimise the impact of an emergency, at least one of the Construction Team personnel will be trained in basic first aid procedures and all field personnel will have immediate access to a first aid kit; and
- Emergency phone numbers will be made available at the commencement of the project and displayed throughout the project in the site office including ambulance, fire service, police and the nearest hospital. All these services can be called on 111 in a life-threatening emergency. In addition, the mobile phone numbers of the Site Supervisor and the Construction Manager will be made available.

Even in the event of an emergency, decontamination procedures should be adhered to unless there is a direct risk to human health.