



## **APPENDIX D**

Draft Site Management Plan

IDENTIFY

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Your Report





## Site Management Plan

Te Puwaha

Whanganui District Council

THE CONTAMINATED SITE CONSULTANCY

## Record of review

<b><i>Roles</i></b>	<b><i>Person responsible</i></b>	<b><i>Position</i></b>	<b><i>Relevant experience</i></b>	<b><i>Signature</i></b>
Report preparation	Brendon Love	Site Contamination Specialist	32 years	
Report Review	Dr Dave Bull CEnvP-SC CChem	Site Contamination Specialist	17 years	  

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# 1. Introduction

## 1.1 Purpose

Whanganui District Council (Council) proposes to construct a new commercial vessel travel lift bay with hardstand area and wharves in part of the Whanganui ('the site'). Detailed design and construction methods are yet to be finalised; generally, the development in this portion of the site will include renewing two wharf structures (Wharf No. 2 and Wharf No. 3), and constructing a new travel lift bay with hardstand area near the western end of Wharf No. 2. The wharf construction includes piles and may include a rock-armoured revetment wall beneath if the wharves are rebuilt in a similar design as they are currently.

The site has been a port since the 1880s, including railway yards. Those land uses appear on the Ministry for the Environment's Hazardous Activities and Industries List (HAIL, categories F5 and F6). There have been several other hazardous industries adjacent to the site over the years, including cement storage (E4), bulk fuel storage terminals (A13), bitumen production and storage (A13), and waste oil collection (A13). Former buildings both on and off site had deteriorated asbestos-containing materials (ACM) in cladding and roofing (E1); while these buildings have been demolished, asbestos-impacted soils remain onsite.

Investigations carried out to date indicate that contaminants have migrated southward onto the site (Ref: HAIL1). Heavy metal and asbestos-impacted soil and fill material is also present on site, and at some locations exceeds commercial land use criteria. With exception of sediment on the southern side of the wharves, the wharf area has not yet been investigated.

The purpose of this draft CSMP is to document some of the procedures and control measures that could be adopted during works to minimise potential risks to human health, discharges to the environment, and to advise on soil and stormwater management and disposal options. It is focused on the proposed development of the travel lift bay with hardstand area and wharf areas of the site. Development plans for the remainder of the site are yet to be developed. This draft CSMP **must** be updated as development plans are finalised, construction contracts procured, and following the completion of further ground investigations.

This draft CSMP, and the investigation reports, are to be submitted in support of consent applications for the proposed development.

## 1.2 Objectives and plan content

The appointed contractors should use this CSMP to supplement their own health and safety and environmental procedures as per the requirements of the Health and Safety at Work Act 2015 (and other applicable legislation, regulations, codes and guidelines).

This CSMP includes the following sections:

- A background section summarising the site, proposed development works and contamination.
- Health and safety procedures to deal with contaminated soil and fill material.
- Erosion and sediment control including soil handling procedures, stormwater control, and soil disposal requirements.

- Monitoring earthworks and implementing contingency measures for dealing with unexpected contamination.
- Reporting requirements.

In accordance with the requirements of Regulation 3 of the NES-CS, the person preparing this CSMP is a suitably qualified and experienced practitioner (refer Certification, page 2).

### 1.3 Roles and Responsibilities

The following section outlines the various roles and responsibilities during the site preparation and civil works phases:

**Table 1: Key personnel**

<b>Role</b>	<b>Responsible person</b>	<b>Tasks</b>	<b>Contact details</b>
Developer and consent holder	Whanganui District Council	<ul style="list-style-type: none"> <li>• Engaging consultants and construction companies to complete the civil works</li> <li>• Legally responsible for compliance with consent conditions</li> </ul>	TBC
Project Manager	TBC	<ul style="list-style-type: none"> <li>• Responsible for site management and implementation of SMP and compliance with consent conditions</li> </ul>	TBC
Site Manager	TBC	<ul style="list-style-type: none"> <li>• Preparing for and supervising works.</li> <li>• Liaising and management of works contractors</li> </ul>	TBC
Site Contamination Specialist	TBC	<ul style="list-style-type: none"> <li>• Training of key personnel to identify potentially contaminated material</li> <li>• Update and revision of this CSMP as required</li> <li>• Collection of additional field screening or laboratory data to characterise excavated material</li> <li>• Review of soil data and provision of advice with respect to appropriate management and/or off-site soil disposal</li> <li>• Providing on-going advice and support on contaminated land issues</li> </ul>	TBC
Management and Removal of Asbestos	Certified removal contractor. TBC	<ul style="list-style-type: none"> <li>• Preparation of asbestos removal control plan (ARCP)</li> <li>• Provides control measures and undertakes removal in accordance with ARCP</li> </ul>	TBC
Asbestos clearance	TBC	<ul style="list-style-type: none"> <li>• Independent assessment of asbestos clearance</li> <li>• Provides clearance certificate</li> </ul>	TBC

Works Contractor	TBC	<ul style="list-style-type: none"><li>• Site establishment and access</li><li>• Setting up relevant control measures</li><li>• Supply of heavy equipment and materials</li><li>• Undertake civil works</li></ul>	TBC
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## 2. Background

### 2.1 Site details

The site is on the Whanganui River estuary, in the suburb of Castlecliff on the north (true right) bank of the river approximately 5 km west of Whanganui town centre and 1 km east of the river mouth. It is at the western end of an industrial area along the riverside.

The site appears to have the postal address 1 Tod St, Castlecliff, Whanganui 4501. Its legal description is Part Lot 1 DP 89274 and Lot 6 DP 435979. It is zoned General Industrial Zone.

The site title has a nominal area of approximately 5.3 ha, but more than half of this is riverbed; the land part forms a shallow half-moon around the harbour basin with Wharf 2 in the west, Wharf 3 in the centre and a boat ramp in the east. (Wharf 1 is immediately outside the site to the west.) There were large warehouses at both wharves: the 'Red Shed' at Wharf 2 is a timber-framed building with corrugated iron cladding which has been demolished, and the 1945 Victory shed at Wharf 3 was clad and partially roofed with asbestos cement (the eastern end had been re-roofed in corrugated iron). Asbestos containing material (ACM) removal works have been completed at the Victory Shed and demolition is currently underway.

The general location and layout of the site is depicted in Figures 1 and 2.

### 2.2 Proposed development earthworks

According to plans provided by Wardale, several proposed design and construction methodologies are currently under consideration for Wharf No. 2 and Wharf No. 3. These are:

- Option 1 – A 2.5 m high precast concrete gravity retaining wall behind Wharf No. 3 and a sheet piled rear retaining wall behind Wharf No. 2, with decks supported by concrete piles. Rock revetment armouring would be placed on the exposed bank between the piles, and fendering comprised of polyethylene-sleeved timber piles, which under deflection from berthing impact compress elastomeric rubber cylindrical fenders.
- Option 2 – Two parallel sheet-piled retaining walls, at Wharf No. 2 with tie bars and placement of engineered fill between the walls, and at Wharf No. 3 constructed as a cofferdam structure with tie bars and placement of granular fill. Fendering could comprise recycled materials including refurbished timber wharf piles, which under deflection compress against recycled elastomeric rubber cylindrical fenders along the capping beam berth face; or floating pneumatic fenders could be deployed along sections of the wharf.
- Option 3 – Wharf No. 3 could be constructed using a lightweight timber structure on driven piles; however this is not the preferred option.

The travel lift bay with hardstand area at the west of Wharf No. 2 would be constructed using the same methodology as Wharf No. 2, using either Option 1 or Option 2 above. This would also involve some removal of existing fill and construction of the travel lift bay hardstand area to allow the travel lift operation. Deeper excavations in this area may require some sheet piling and excavation dewatering.

Pile sizes for Option 1 or Option 2 are likely to be circa 500 mm. Due to potential noise issues the construction methodology will be to vibrate steel tubes into the ground, then using a drill remove the waste soils within the tube, add a reinforcing cage, and pour with concrete. For the sheet piled areas (hardstand edge, runway edge) the sheet piles will be installed to the outer perimeter of the area, so will assist with controlling sediment discharges into the harbour.

Further soil disturbance will be created during the removal of the existing timber piled structures, where piles will either be withdrawn from the soils using a shore-based crane or will be cut at riverbed levels if the pile cannot be extracted. The methodology will utilise a shore-based crane to put upward pressure on the timber pile releasing the pressure. In some instances, the contractors may choose to use a vibrator to break the pile-to-soil friction.

It is also proposed that new rock armour revetment will be added to the existing seabed. This is likely to involve placing further rock armour to the east of Wharf No. 3, tying into the existing revetment wall. It is not anticipated that the existing revetment wall will be disturbed.

The development will also require staging areas and access routes; the full layout is yet to be designed. Once detailed design drawings and a construction contractor is appointed construction staging areas can be identified and the CSMP can be updated to reflect these plans.

The proposed development areas are shown on Figure 2 and an indicative development plan is provided in Appendix A.

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Figure 1: Site Location Plan, Te Puwaha – Port Project





Figure 2: Site Layout, Te Puwaha





**WHANGANUI DISTRICT COUNCIL**  
Te Kaitiaki a Hōne o Whanganui

**TE PŪWAHA**

Client: Whanganui District Council

Location: Whanganui Port

Project: Te Puwaha – Port Project

Title: Port Project & CMA

Drawing: WM\_Port\_Project\_CMA      Revision: 06

Scale: 1:1,600 @ A3

Date: 25 October 2021

Revisions:

01	29/09/21	Overlay Services
02	04/10/21	Port Office Asbuats
03	12/10/21	Earthworks
04	18/10/21	CMA Overlay
05	22/10/21	OCCEI Overlay
06	25/10/21	Updated Wharf Design

Notes:  
1. All dimensions are in metres, unless otherwise stated.

1:1,600 @ A3

0 15 30 60 Meters

**WARDALE**  
marine industry consulting

PO Box 147003, Poneke, Auckland, New Zealand  
+64 (0)9 360 9285  
info@wardale.co.nz  
www.wardale.co.nz

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## 2.3 Contamination status

The following summarises the contamination status of the portion of the site where the travel lift bay with hardstand area and wharf development is proposed. This summary is derived from previous investigations and the Tonkin and Taylor (T&T) sediment investigation (Ref: T&T1). These investigations were largely outside the proposed development area, due to demolition works and to potentially unstable voids beneath the wharves. It is likely that conditions within the development area, which is known to contain uncontrolled fill, will be variable, potentially quite different in places to the rest of the site. This draft CSMP will need to be updated as and when more information comes to light.

### **Soil and water quality**

Former buildings on site were observed to contain asbestos-containing materials (ACM). Field screening and soil sampling and analysis indicated that lead based paint had been used on the exterior of the buildings. Flakes of paint and fragments of asbestos had transferred to surficial soils across the site. These observations were validated through soil sampling and analysis.

Variable fill comprising bricks, gravel, timber, and historical demolition waste was observed in voids near the existing wharves, and in spoil from a recent excavation to install a stormwater pipe near the wharf edge. Stockpiled fill was observed to contain fragments of 'Super 6' corrugated cement sheeting. Samples collected from the stockpiled fill was confirmed to contain asbestos by laboratory analysis.

Soils and fill material from the proposed development area of the site have generally not been characterised. It is likely that most of the excavated material will be unsuitable for disposal as clean fill.

Historic investigations showed that a plume of diesel range hydrocarbons extends from the asphalt plant at 501 Heads Road southward onto the site. HAIL Environmental has confirmed that petroleum hydrocarbons are still present to the rear of Wharf 3 and appear to be discharging freely to the open drain there. It is likely there is an active source. Whether this plume extends into the wharf area is unclear.

### **Sediment quality**

T&T collected eight cores directly in front of Wharves Nos. 1-3 to depths of up to 2.5 m below sediment surface. Surface samples were analysed individually and samples from 1.0 m below sediment surface were composited for analysis. The analytical suite comprised selected heavy metals, tributyltin, a suite of organochlorine pesticides (OCP), a suite of polycyclic aromatic hydrocarbons (PAH), and total organic carbon (TOC). Tributyltin, OCPs and PAH were not detected; heavy metal concentrations were low, especially at surface where levels are most likely indicative of background concentrations. (Ref: T+T1).

Sediment removed from site is likely suitable for disposal as clean fill. Given these findings, no contamination-specific control measures are proposed for development activities that disturb harbour sediments.

## 3. Site Management Procedures

### 3.1 Overview

This section provides procedures for personnel working in and around contaminated soil and fill during the earthworks programme. This plan should supplement the contractor's own health and safety procedures. Draft controls are indicative only; this CSMP must be revised once detailed design plans are prepared and be finalised before the proposed works begin.

Potential human health risks associated with earthwork activities in the proposed development areas relate to contaminants derived from previous site activities (namely asbestos and heavy metals in surficial soils and fill, and hydrocarbons to the north of Wharf No. 3). Potential risks relate to:

- Dermal contact with contaminated soils during remediation or development earthworks.
- Incidental ingestion of contaminated particulate during site disturbance.
- Inhalation of asbestos fines / fibrous asbestos during site disturbance.
- Inhalation of hydrocarbon vapours when working in enclosed spaces.
- Mobilisation of contaminated soil, groundwater and/or free phase hydrocarbons from areas of disturbed ground during development activities into the adjacent river.

This CSMP is one of a suite of plans for the works, which should be read and implemented together. Controls for asbestos should be documented in an Asbestos Removal Control Plan (ARCP). Erosion and sediment controls can be found in the ESCP. Controls on noise, dust, access, discovery of taonga / koiwi / historical artefacts, complaints and other general project matters can be found in the SMP.

### 3.2 Site establishment and training

A copy of the most recent CSMP shall be always available on site. In case of any doubt or uncertainty as to what controls are required, the SQEP shall be consulted.

Pre-development setup shall include:

- Obtaining approval from the consent authority to begin work. This should include a site pre-commencement meeting with relevant authorities and project staff.
- Setting up site offices and demarcation of the excavation areas. Copies of relevant plans and consents should be always kept in the site office.
- Construction of sediment and erosion control measures per the ESCP.
- Management or remediation of surficial contaminants (ACM fragments, heavy metals) shall be carried out prior to development works commencing. Further testing may also be required in areas to be used for construction purpose to ensure that human health risks to site workers are adequate.
- Applying hardfill or dust suppressants within earthworks areas and haul roads.
- A change and wash facility and a personal protective equipment (PPE) store for workers (located outside of the earthworks area).

- Induction for workers working at the site including the appropriate use of PPE.
- The successful management of contaminated land requires input from personnel undertaking physical works. The Site Manager shall nominate personnel to be trained on indicators of contamination, sufficient that there will always be trained personnel in the ground works area. The SQEP will provide field-based training where selected personnel can physically observe contaminated soil and material.
- Setting up a soil stockpiling area where soil, fill and sediment can be held to dewater and be assessed for disposal or reuse. This area must be bunded, ideally covered, and drain to a suitable interceptor or settling tank so that dewater and runoff can be assessed and treated before discharge. It must have sufficient area to allow for a minimum of two weeks' storage, plus space to move soils around and segregate material based on suitability for use.

During earthworks:

- The controls set out in the following sections shall be implemented.
- Direct contact with soil shall be avoided.
- Daily health and safety toolbox meetings should be undertaken and documented. Where necessary this plan shall be updated to reflect changing site conditions.
- As general good practice, workers shall maintain good personal hygiene:
  - Avoid hand to mouth/face contact during work.
  - Wash hands before eating, drinking, applying sunscreen and/or cosmetics, smoking, which should be done only in designated area.

### 3.3 Personal protective equipment

To protect against the potential risks, all workers handling soils onsite shall wear the following PPE. This PPE should supplement site contractors' own safety equipment. An ARCP should outline PPE requirements for any asbestos related work.

- Safety glasses.
- Disposable gloves and coveralls shall be worn by personnel who need to have contact with soil during the excavation works. Gloves shall be replaced regularly and shall be removed when personnel exit the earthworks zone.
- Disposable dust masks must be available to staff during earthworks. The general use of dust masks shall be at the discretion of each individual person; however, the Site Manager can require their use at any time.
- Respirators with organic filters may be required if petroleum hydrocarbons are encountered.

The following decontamination procedures must be observed after contact with contaminated material has occurred:

- Rinse boots and gloves with detergent and rinse with a hose.
- Disposable PPE (i.e. mask, gloves, coveralls) shall be placed in plastic bags for disposal to a licensed landfill.

During the removal of the asbestos-impacted soil workers must follow the ARCP. Indicatively workers would also be required to wear the following additional PPE:



- Single use disposable gloves.
- Safety eye wear.
- P2 dust mask or half-face P3 respirator with particulate filter(s).
- Type 5/6 disposable coveralls.
- Laceless boots (preferred) with disposable covers or steel cap gumboots.

Machinery and/or trucks involved in the removal of asbestos impacted soil will likely be required to keep cab windows closed and use air conditioning.

### 3.4 Decontamination facilities

Decontamination is required for machinery and personnel that may have contacted asbestos-contaminated soil and should be undertaken as per the project Asbestos Removal Control Plan (ARCP).

As a general guide, a dedicated decontamination area shall be located at the entry/exit point of the remedial area. As a minimum, the following should be provided in the decontamination area:

- Portable water spray to wet down PPE upon entering the decontamination area.
- PPE changing facilities.
- Boot wash.
- A hand and face wash facility with wet wipes.
- Heavy duty polythene bags (200 µm minimum) for disposal of contaminated PPE and other consumables.

The ARCP will require machinery and tools leaving the remedial area to be inspected for debris and soil (on tracks, wheels and buckets). Accumulated dirt would be removed over an area covered by 200 µm polythene. Accumulated sediment or plastic sheeting will be managed as asbestos waste and disposed offsite as per below procedures.

### 3.5 General earthwork monitoring

Given the variable nature of fill material and the extensive industrial history of the site it is likely that other contaminated soil or wastes may be encountered during earthwork activities. Odours, stained or unusually coloured soils or general waste material would be a particularly concerning sign. **Should there be any concerns the SQEP must be consulted** and this CSMP may need to be revised.

If other unexpected material is encountered (i.e. green stained or odorous soil, unusually coloured soil, anthropogenic material such as refuse, intact or broken drums and containers or potential ACM) it is unlikely to be suitable for reuse and disposal options must be reviewed.

The SQEP will assess the material and advise on its management. A site contamination report shall be prepared. Where relevant the report shall document: the nature and extent of the material; its suitability to remain on site (from an environmental impact and human health perspective); proposed disposal location and estimated volumes.



The SQEP must immediately contact Council if further contamination is discovered and seek approval for these proposed Contingency Plan measures prior to them being implemented.

If buried wastes are uncovered during earthworks the following shall be implemented:

- Earthworks should cease in the area. The area should be cordoned off from worker access.
- A SQEP shall attend the site and shall investigate the area.
- Works may commence when investigations are completed and following approval from the SQEP.
- Areas of exposed impacted soil shall be limited.

The above is an initial outline of what is being proposed. Actual measures to be implemented will be those recommended by the SQEP and approved by project team and regulatory authority representatives.

### 3.6 Air monitoring

Air monitoring will be specified by the ARCP for any Class B asbestos removal works. Based on investigation results this requirement will apply at minimum to the removal of the asbestos impacted stockpile. Due to the apparent variable fill quality, air monitoring is recommended to determine the effectiveness of dust control measures during construction activities, particularly if other remediation methods are not adopted prior to construction works. This requirement shall include, at a minimum:

- Be undertaken by an independent competent person as defined by the Approved Code of Practise (ACOP) (Ref: Worksafe).
- Be undertaken using a membrane filter method.
- Include the placement of an air monitor on each boundary of the remediation work zone.

The principal contractor shall liaise with the air monitoring specialist to advise of further requirements.

As per the ACOP the following action levels and controls shall be implemented:

**Table 2: Air monitoring trigger levels.**

<b>Action Level</b>	<b>Control</b>	<b>Action</b>
< 0.01 fibres/ml (trace level)	No new control measures are necessary	Continue with existing control measures
≥ 0.01 fibres/ml but < 0.02 fibres/ml	1. Investigate	Investigate the cause
	2. Implement	Put controls in place to prevent exposure
	3. Prevent	Prevent further fibre release
≥ 0.02 fibres/ml	1. Stop	Stop soil disturbance
	2. Notify	Notify WorkSafe as soon as possible as a notifiable incident. Include results of air monitoring.
	3. Investigate	Conduct a thorough visual inspection of work area and review controls such as dampness.
	4. Put controls in place to prevent exposure and further asbestos fibre release.	Consider extending the area of the 'dirty zone' to capture other soil disturbance areas. Do not re-start work until fibres are at or below 0.01 fibres/ml.

### 3.7 Dust mitigation

Dust at the site shall be controlled in accordance with the *Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions* (Ref: MfE4) and include the following:

- Establish stabilised entrance/exit way and wheel wash facility to minimise mud and dust track-out from unpaved areas.
- Place hardfill over any exposed soils that will be trafficked over during development works, to prevent the spread of contamination in dirt, dust and runoff.
- When stockpiling, limit drop height of soil onto stockpile, and keep the material damp. Alternatively, load soil directly into truck and trailer units by placing the material or limiting drop heights. Limit load sizes to avoid spillages. Cover truck and trailer units with tarpaulins on route to disposal facility.
- Regularly clean up spillages of soil on paved surfaces.
- Implement traffic controls including access restrictions and speed limits. Targeted and temporary speed restrictions of 5 to 10 km/hr shall be implemented in response to adverse conditions.
- If nuisance dust is still being generated, additional measures may include installing windbreak fences, covering stockpiles and ceasing works until wind strength decreases or changes direction
- Visually monitor dust during dry conditions, and if required keep active earth working areas damp using water, in such a way that the water application does not cause surface runoff that would discharge into the environment.

### 3.8 Stormwater and sediment control

Stormwater and sediment controls will be set out in the ESCP. This will require potential risks to the environment from the proposed redevelopment activities the earthworks to be mitigated in accordance with *Erosion and Sediment Control Guidelines for the Wellington Region* (Ref: GWRC), and likely include:

- Stormwater infrastructure on site shall be protected prior to commencement of works. This may include the installation of silt fences near open drains and geotextile cloth covers on stormwater catch pits.
- For sheet piled areas, the outer piled wall shall be installed as soon as practicable, to prevent the mobilisation of soils towards the river.
- The proposed travel lift bay with hardstand area requires excavation directly adjacent to the harbour. Given tidal fluctuations it will be difficult to install / maintain any hard control structures that will be effective. Earthworks in the tidal zone may need to be completed only during low tide periods. Silt curtains may also be useful in limiting the migration of sediment beyond the earthworks area.
- Where disused timber piles and wharf structures are to be removed this should be undertaken only during low tide periods. Silt curtains may also be useful in limiting the migration of sediment beyond the earthworks area.
- Material excavated from piled holes shall be stockpiled in the designated area until disposal options can be determined. Stockpiles shall be covered and surrounded by either earth bunds or silt fences to prevent sediment runoff.
- Excavated material will be stockpiled and dewatered prior to disposal. Captured water should be analysed to determine appropriate disposal options. These may include on site treatment and infiltration, through to offsite disposal.
- Stabilisation measures will also be employed to minimise erosion on site. These will be used on site as required, and in rapid / adaptive response to anomalies during regular monitoring.

### 3.9 Concrete construction control measures

Construction utilising concrete near the marine environment has the risk of discharging sediment, cement and concrete to the river. Measures to be taken to prevent cement discharge will include:

- Concrete pours will only be undertaken when river/tide levels are predicted to at least 1 m below foundation level for a period of 48 hours from commencement of any pour. Where this is not possible pre-cast elements should be utilised, including on the wharves and proposed travel lift bay with hardstand area.
- Appropriate bunding devices will be employed to prevent any seepage of cement during any concrete pour and will be maintained for a 24-hour period.
- Trucks delivering concrete will be required to wash chutes back at their depots. No surplus concrete or wash water will be disposed of on site.

### 3.10 Odour

Odours may occur if hydrocarbon contaminated soil is uncovered, particularly to the north of Wharf No. 3. The following shall then be implemented:

- All windows and doors on the adjoining commercial building will be closed during the remediation works.
- Areas of exposed impacted soil shall be limited.
- Impacted material shall not be stockpiled on site but shall be placed directly into truck and trailer units for offsite disposal.
- Heavy tarpaulins will be available on site at all times, and if necessary, shall be used to minimise odour levels.
- If odours occur, the downwind perimeter of the site shall be monitored by the SQEP for objectionable or offensive levels. If objectionable or offensive odours are observed, works shall cease, and tarpaulins shall be applied over the source area. Works may commence when there is no longer objectionable or offensive odour at or beyond the downwind site boundary, or an alternative process is identified by the SQEP to reduce odours during the works.
- If hydrocarbon odours occur or hydrocarbon-stained soil or impacted groundwater is encountered volatile contaminants may pose a risk to site workers. The 'volatile contaminants' contingency measures in Section 3.10 must then be implemented.

### 3.11 Volatile contaminants

Hydrocarbon contamination is known to be present to the north of Wharf No. 3. Groundwater investigations are necessary to determine groundwater quality beneath the site and associated control measures or remediation requirements if groundwater contamination presents a risk to human health or the environment.

At present proposed development activities near the northern boundary area are unknown. Consideration should be given to the following control measures if further investigation or disturbance in this area is proposed. In addition to risk associated with volatile compounds the potential presence of separate phase hydrocarbons (SPH) and SPH mobility should be considered in advance of any ground disturbance in this area.

Hydrocarbon impacted soil or groundwater may generate vapour at concentrations that pose a risk to site workers or future commercial building occupants. If these conditions are observed during earthwork activities, works shall immediately cease and the following implemented:

- A SQEP shall attend the site and shall use a photoionisation detector (PID) and a explosimeter (LEL) to monitor air quality around the site and within the area of the earthworks. Action levels are:
  - PID > 50 ppm
  - LEL > 1 %

If action levels are exceeded:

- All work will cease in the area until the vapour levels reduce below these thresholds.
- Personnel shall move 10 m upwind.
- No sources of ignition (including electronic devices such as mobile phones) in the area immediately surrounding the works area, and only use intrinsically safe equipment within 5 m of the works area.

- Advice obtained from the SQEP regarding the need for additional controls.
- The SQEP shall retest the area before re-starting works (wearing a respirator).
- Works may commence when action limits are met and following approval from the SQEP.
- Entry into all confined spaces, that is excavations greater than 1.2 m in depth, is restricted to trained personnel wearing breathing protection and equipped with PID and LEL (Ref: AS 2865).

### 3.12 Soil disposal

Volumes of soil disposal have not yet been finalised. Where possible material should be re-used on site to reduce truck movements and landfill disposal. This may include designs for the encapsulation of contaminated material within project structures, dependent upon the final design. Containment structures may require additional consenting. This approach will also result in a more sustainable outcome for the project.

Where soil cannot be re-used on site it is not suitable for disposal as cleanfill. Material should be stockpiled in the designated area and tested at a minimum rate of 1 test per 200 m<sup>3</sup>, for heavy metals and asbestos. Further tests for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) should be undertaken for material arising from the north of Wharf No. 3, or where hydrocarbon odour or staining is noted. Where material is significantly different to that encountered within the DSI a SQEP should be referred to and further analysis may be required.

Dredged sediment may be suitable for disposal as cleanfill.

### 3.13 Imported fill

The cut to fill plan suggests that imported fill should not be required. If material is to be imported sufficient testing should be undertaken to ensure that it is suitable for the proposed use and its use will not generate any human health and environmental effects. Testing requirements may include the establishment of total contaminant and leachate concentrations.

### 3.14 Excavation Dewatering

#### 3.14.1 Overview

Contaminated groundwater originating from properties to the north of the site is known to have been impacted by historical hydrocarbon releases (Ref: HAIL). Surface water drainage channels along the northern boundary were noted to flow freely during site inspections, indicating that artesian groundwater is present beneath the site. Disturbance of ground may lead to preferential pathways being created and the potential discharge of contaminated groundwater to the harbour.

It is likely that some dewatering will be required to facilitate the proposed travel lift bay with hardstand area construction. Investigation of groundwater before construction is strongly recommended to determine appropriate control or remediation measures. Based on current information the control measures outlined in sections 3.14.2 – 3.14.3 are recommended. Further groundwater investigation is recommended throughout the site to determine if the following control measures and monitoring is adequate. This section of the CSMP should be updated to reflect additional investigation results.

### 3.14.2 Groundwater treatment

Following the installation of sheet piles around the proposed excavation area (and prior to soil excavation) the groundwater table will be lowered within the sheet piled area by well pointing.

Water removed from the tank pit will discharge over a plastic crate (to help volatilise any hydrocarbons) into the first chamber of an onsite filtration system (such as a weir tank). The purpose of the weir tank is to filter out solids.

Water will be monitored and if suitable (see below) will be discharged to stormwater.

### 3.14.3 Monitoring

Water within the filtration system shall be monitored by the Site Manager upon start-up and at two hourly intervals for the first 12 hours of pumping, and thereafter at 6-hourly intervals.

Monitoring of the final filtration chamber will be undertaken and comprise:

1. Observations for oil or grease sheen and hydrocarbon odours. If observed the discharge shall cease and the surface of the water skimmed off by vacuum truck for disposal at a liquid waste facility. Remaining water shall be tested in accordance with point 2 below.
2. Collection of two grab samples for headspace screening using a PID.

The headspace screen involves filling the sample jar half full with sampled water, covering the jar with aluminium foil and then sealing the jar with a lid. The sample is then shaken vigorously for several minutes to promote the release of volatile organic compounds from the dissolved phase to gas phase. The lid of the jar is then removed and the PID tip is then carefully inserted through the aluminium foil seal. The headspace sample is then tested and the result recorded.

If the PID results are below 10 ppm water quality will be considered suitable for disposal to stormwater.

If PID results >10 ppm the discharge shall cease and a water sample shall be collected to confirm concentrations of TPH are below the stormwater discharge limit of 15 mg/L (Ref: MfE3). If criterion is exceeded additional treatment methods (such as sparging or absorbent socks) shall be used, or the water shall be removed by a vacuum truck to a liquid waste facility.

3. To ensure that water quality is relatively free of suspended solids a grab sample will be collected. The water sample will be field tested for turbidity. If the results are below 20 nephelometric turbidity units (NTU) the water will be relatively free of suspended solids and the discharge can continue. If results are above 20 NTU the discharge shall cease and a sample shall be submitted to the laboratory for analysis for total suspended solids. The treatment train shall be reviewed and if necessary additional measures employed to reduce suspended sediment levels below 100 mg/L (Ref: MfE3). Such measures may include the use of flocculants and coagulants to aid in the settlement of suspended sediment and/or the addition of filter socks to outlet pipes. If dewatered water is not suitable for discharge to stormwater it will be removed by a vacuum truck for disposal to a liquid waste facility.

Monitoring data will be reviewed with respect to the pending dewatering consent for the site, and/or *Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand* (Ref:MfE7).

### 3.15 Stormwater monitoring and disposal

Stormwater generated in excavations may contain contaminants that present a risk to the environment. Stormwater sampling and analysis should be undertaken prior to any discharge of stormwater to the receiving environment. Where heavy metal contaminant levels exceed consented discharge criteria consideration should be given to allowing stormwater to discharge to ground via a sand filter, or offsite disposal. The use of triple interceptor separators should be considered in excavations where hydrocarbon impacted stormwater is likely to be generated.

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## 4. Works Completion Report

Within three months of completing earthworks a Works Completion Report (WCR) shall be prepared. The reports shall be completed in accordance with *Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand* (MfE3) and shall include:

- An overview of works completed at the site, noting compliance status with respect to this CSMP and the relevant land use and discharge consent.
- Site plan showing location of final excavations and soil sample locations.
- Soil test results for any soil and water disposed offsite or imported to site.
- Total volume of soil and water disposed offsite; including copies of waste transfer documentation.
- Overview of any unexpected areas of contamination encountered during the works, and associated remediation methods employed.
- Summary of any complaints received, or environmental or human health incidents and subsequent mitigation measures.
- Site plan showing areas of residual contamination exceeding relevant soil contaminant standards.

## 5. Limitations

This draft CSMP has been prepared by HAIL Environmental for Whanganui District Council in accordance with the purpose and scope set out above, and the usual care and thoroughness of the consulting profession. This draft CSMP has been prepared based on current investigation results and preliminary designs for the wharf and travel lift bay with hardstand area development portion of the site. HAIL Environmental highlights that fill material has been derived from unknown sources and may contain contaminants that have not been identified during current investigations. Further investigation is required to characterise groundwater beneath the site and determine remediation or management requirements. This CSMP should be updated based on this additional information prior to commencing with civil works. This draft CSMP has been developed to provide guidance to the consent authority as to appropriate control measures that should be introduced to manage human health and environmental effects. Some control measures outlined in this draft CSMP may be superseded by other documents such as approved asbestos removal control plan (ARCP), sediment and erosion control plan (ESCP), and resource consent conditions. Any use of any part of this report by any other party, or in any other context, is the responsibility of the user. Information from cited sources has not been independently verified unless specifically stated, and HAIL Environmental assumes no responsibility for any inaccuracy or omission therein. This plan does not purport to give legal or financial advice.

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**Appendix A: Proposed site development plans To be appended when available.**

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