CONTAMINATED SITE MANAGEMENT PLAN

EASTLAND PORT WHARF 7 DEVELOPMENT

FOR EASTLAND PORT LTD,
GISBORNE

PROJECT NO. EAM2205-REP-01-CSMP (VERSION 1)

PREPARED FOR
EASTLAND PORT LIMITED

PREPARED BY
JASON STRONG

NOVEMBER 2021

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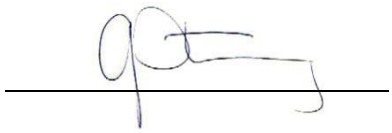

LIMITATIONS:

This report has been prepared based on information provided by third parties. EAM NZ LTD has not independently verified the provided information and has relied upon it being accurate and sufficient for use by EAM NZ LTD in preparing the report. EAM NZ LTD accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information. This report has been prepared by EAM NZ LTD on the specific instructions of Eastland Port Limited for the limited purposes described in the report. EAM NZ LTD accepts no liability to any other person for their use of or reliance on this report, and any such use or reliance will be solely at their own risk.

EAM
ENVIRONMENTAL CONSULTANTS

1.0 INTRODUCTION

EAM NZ LTD (EAM) has been engaged by Eastland Port Ltd (EPL or the client) to develop this Contaminated Site Management Plan (CSMP) to support earthworks associated with the proposed redevelopment of the EPL Wharf 7, located at 11 Kaiti Beach Road, Gisborne (the site). The location of the site is provided in Figure 1.

1.0 BACKGROUND

We understand the client is intending to remove existing hardstand to extend Wharf 7 infrastructure and regrade the current surface level. As part of the redevelopment, the client is proposing cut to fill volumes across the site down to underlying beach sand. Typical cuts are proposed to be 3.5 m bgl.

1.1 4SIGHT DETAILED SITE INVESTIGATION

4Sight Consultants Ltd conducted a Detailed Site Investigation (DSI) across the site in December 2018, which was updated in May 2019 to characterise soils across areas of proposed soil disturbance for the Eastland Port Entry Development. The DSI included areas associated with the Wharf 7 redevelopment (refer Figure 1).

The 4Sight DSI concluded:

- All samples identified fibrous asbestos and asbestos fines (FA/AF) and bonded ACM below detection limits and therefore below the adopted BRANZ guidelines, with the exception of EP11_1000 which exceeded BRANZ Guidelines with a concentration of 0.005 %w/w. The remainder of soil samples did not contain the presence of asbestos; and
- Concentrations of heavy metals and PAH are below the adopted NESCS Soil Contaminant Standards (SCS), and MfE Petroleum Hydrocarbon Guidelines for commercial / industrial use in all soil samples analysed.
- The concentrations of contaminants in soil are considered highly unlikely to present a risk to human health or the environment during soil disturbance activities (provided good earthworks and dust controls measures are implemented) or for ongoing commercial industrial land use.
- Due to the heterogenous soil and fill material at the site, it is recommended that soil disturbance activities in the asbestos management areas (areas where asbestos has been identified) are completed as asbestos related work under the BRANZ guidelines. Soil disturbance work should be completed by a licensed asbestos removalist, with air monitoring conducted by a licensed asbestos assessor, and appropriate management controls as defined in a Contaminated Site Management Plan (CSMP).
- A CSMP will need to be developed which includes controls to manage potential risk to human health of excavation workers and port employees during excavation activities, outlines appropriate soil handling and disposal requirements for soil both within the asbestos management area and across the remainder of site, and provides controls specific to work within the asbestos management areas (such as appropriate PPE and equipment clearance sampling at the completion of works for works);
- Further delineation sampling will be completed to identify the lateral and vertical extent of the asbestos contaminated soil between soil sample locations EP02 and EP03. The DSI and CSMP should be updated once delineation sampling has been completed to reflect sampling results and to refine the asbestos management area; and
- A Works Completion Report (WCR) will be required once soil disturbance and removal has been completed. This will confirm the destination of removed contaminated soils (if any), that works were undertaken in accordance with the CSMP, and provide results of asbestos air monitoring / clearance sampling.

FIGURE 1: ASBESTOS MANAGEMENT AREA FROM 4SIGHT DETAILED SITE INVESTIGATION.

1.2 EAM NZ LTD VALIDATION SAMPLING WITHIN IDENTIFIED ASBESTOS MANAGEMENT AREA

EAM NZ Ltd were engaged by EPL to undertake validation sampling within the identified (from 4Sight DSI) asbestos management area. This occurred during the period May 2020 to July 2020. The area where this occurred are shown as Figure 2.

In total, 74 samples were collected and analysed for asbestos as a trench to establish a new stormwater pipe was excavated. Of these samples only nineteen recorded asbestos as present. Of these only one sample exceeded the BRANZ Guidelines with a concentration of 0.007 %w/w. The soil that recorded asbestos above BRANZ Guidelines were reburied within the trench at a depth of approximately 2 m. Uncontaminated soils and those with asbestos present (but below Guideline of <0.001% w/w) were either returned to the trench or taken to the EPL Dunstan Road Aggregate Yard for use in the new pavement construction (as permitted under EPL Resource Consent).

1.3 EAM NZ LTD ADDITIONAL SAMPLING FOR WHARF 7 EXCAVATIONS

Additional sampling was undertaken for the proposed Wharf 7. The sample sites chosen were outside of the area previously excavated for the installation of the stormwater pipe (and outside the identified asbestos management area) as discussed in Section 1.1. Three sites were sampled (Figure 3). Sampling was to be conducted at three depths (0-0.5m, 0.5-1.0m, and 1.0-1.5m) to determine the absence/presence of asbestos. Unfortunately, Sample Site #3 was only sampled to a depth of 1.0m due to the presence of large amounts of rock and concrete which prevented excavation below this depth (rocks, concrete, and rubble were noted in each of the three sample locations to a depth of at least 1.0m bgl.

All results were negative for asbestos. The full report of analysis is attached as Appendix 1.

1.4 SUMMARY OF SOIL SAMPLING IN RELATION TO WHARF 7 PROPOSED EARTHWORKS.

Current soil sampling data illustrates the that proposed area of earthworks for the redevelopment of Wharf 7 contains soils/fill that are very heterogenous in nature and are negative for asbestos.

Asbestos concentrations in the adjacent asbestos management area (from the 4Sight DSI) are typically below BRANZ Guideline value of 0.001% w/w although it is possible that isolated areas will exceed this value. Based on this information it is considered highly unlikely that earthworks in the Wharf 7 excavation area present a risk to human health or the environment during soil disturbance activities (provided good earthworks and dust controls measures are implemented) or for ongoing commercial industrial land use.

However, due to the presence of asbestos recorded within the adjacent asbestos management area (from the 4Sight DSI) it is recommended that the following CSMP be initiated should asbestos be encountered within the excavation area.

The CSMP will be initiated should asbestos be visually identified and/or found present within sampled soils.

It is recommended that 14 samples per 1000 m^3 of excavated soil be sampled and analysed as it is removed. These soils should be stockpiled (and covered) at the Wharf 7 site until laboratory results are received back from the laboratory.

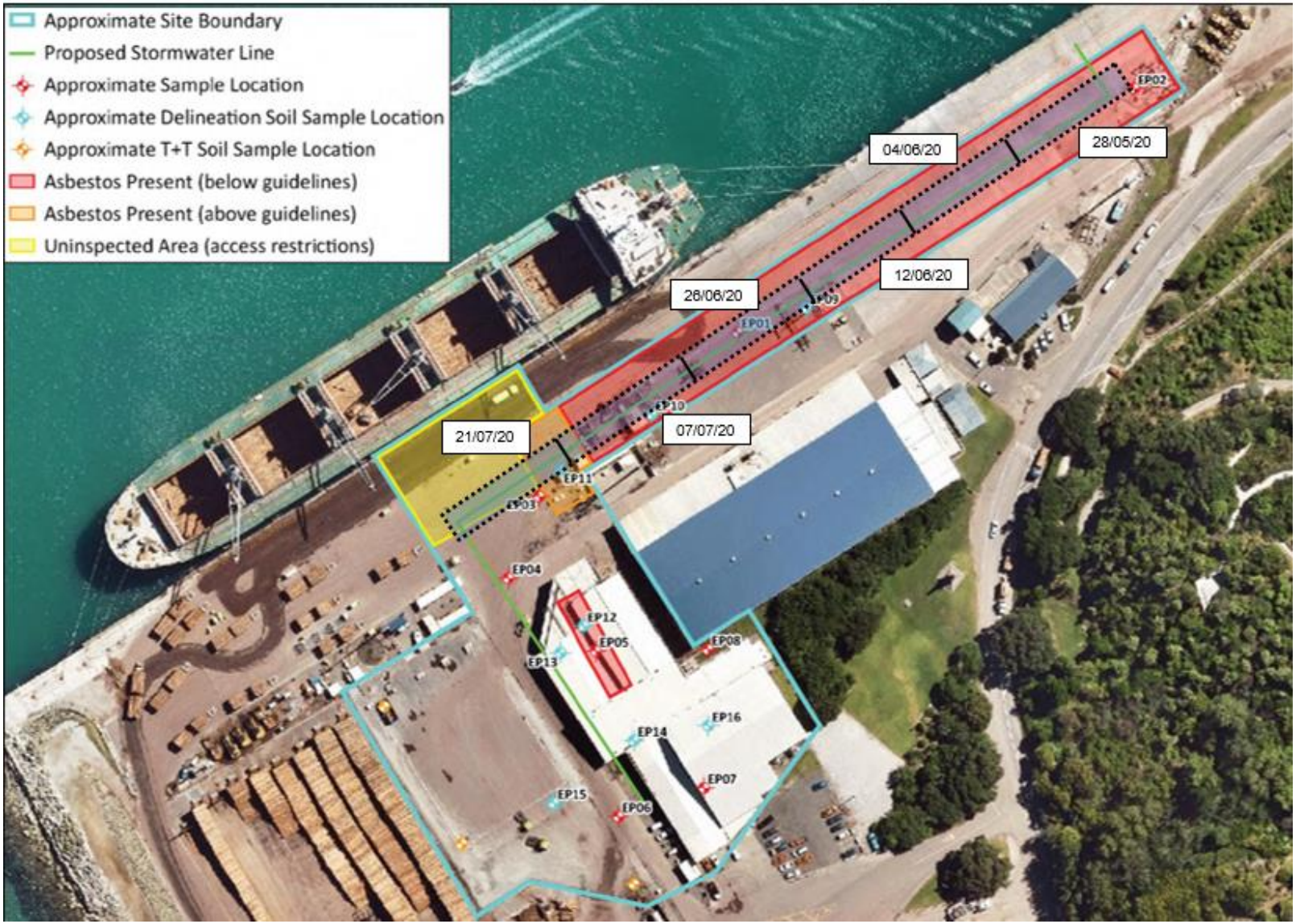

FIGURE 2: VALIDATION AREA UNDERTAKEN BY EAM NZ LTD

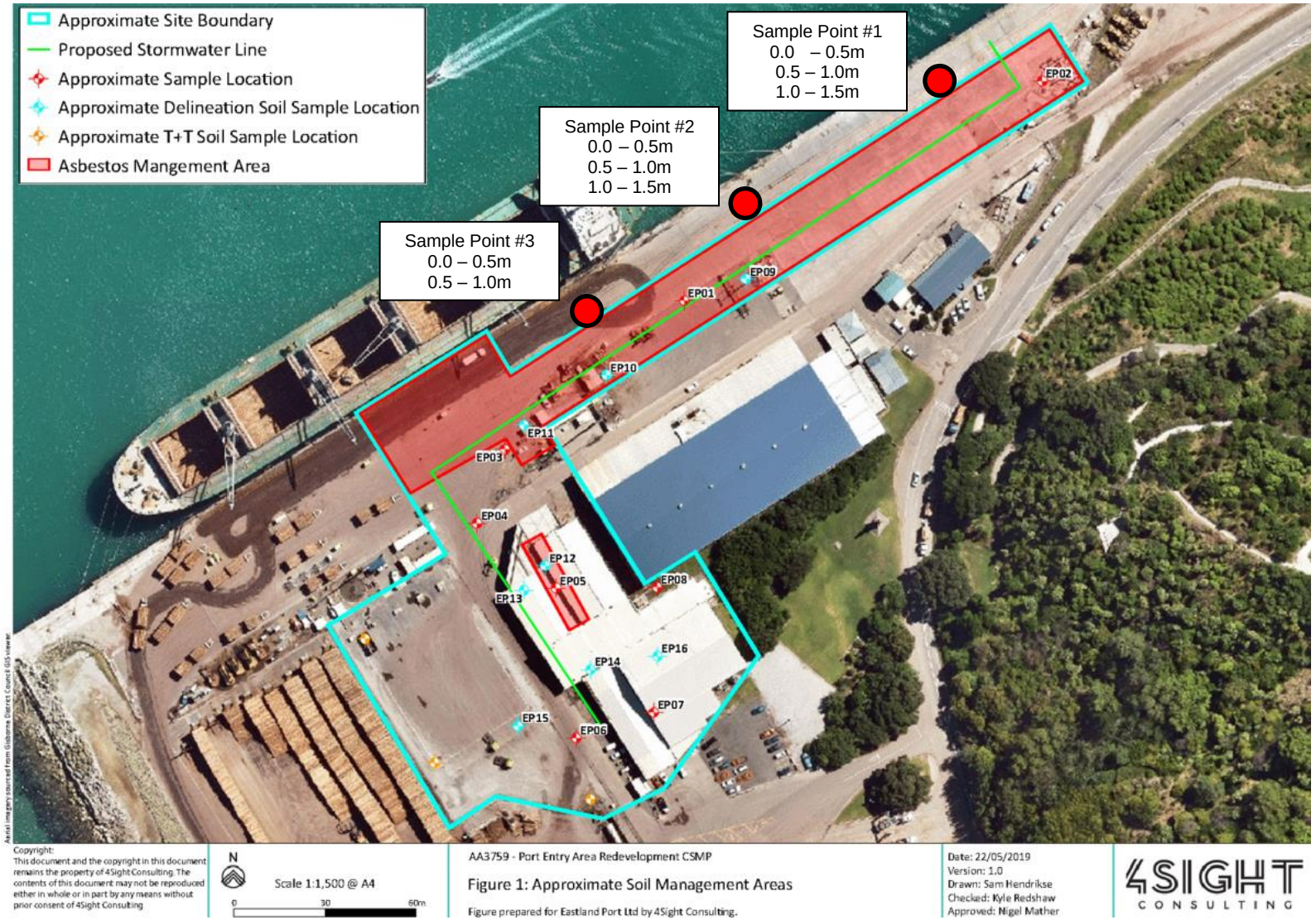

FIGURE 3: LOCATION OF FURTHER SAMPLING FOR WHARF 7 REDELOPMENT UNDERTAKEN BY EAM NZ LTD

1.5 CSMP PURPOSE

The development of a CSMP is required to manage known areas of contaminated soil and potential unexpected discovery of contamination that may be encountered during the execution of proposed earthworks during redevelopment of the site. This CSMP has been developed in general accordance with the requirements of the MfE Contaminated Land Management Guidelines (CLMG) No. 1 (revised 2011) Reporting on Contaminated Sites in New Zealand (CLMG No. 1).

This CSMP also serves as a management plan in regard to the Ministry for the Environmental (MfE) National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE,2011). The CSMP also provides controls to avoid / limit dust generation and run-off / erosion during the earthworks phase of development.

The controls set out in this CSMP are provided to manage the proposed works within the Wharf 7 development site.

Implementation of the procedures in this document will assist in providing the necessary controls to manage potential exposure to excavation workers during the works. It also sets out appropriate controls for off-site soil disposal of contaminated soils (if required).

In accordance with the provisions of the Health and Safety at Work Act (HSWA, 2015), it is the responsibility of the supervisor of the place of work to communicate to their workers undertaking work on the site the nature and extent of the identified contamination, and associated hazards associated, including recommended management practices. The CSMP is intended to support this process and does not relieve the supervisor of the place of work of their responsibility for the health and safety of workers. The CSMP also does not address “general” health and safety, such as working at heights and other physical hazards and is focussed on hazards presented by hazardous substances at the site.

The persons undertaking, managing, and authorising release of this report are suitably qualified and experienced practitioners (SQEPs) as specified in the NESCS.

1.6 SCOPE OF WORKS

The scope of the CSMP includes:

- Site description and background information.
- Current soil contamination status and reasons why management is required / necessary.
- Asbestos contaminated soil management procedures.
- Site control requirements (signage, access, etc.).
- Storm water management and erosion control.
- Dust control / management.
- Health and safety considerations; and
- Contingency measures, and triggers for implementing those measures.

In areas where asbestos concentrations in soil have been identified, specific controls prior to and during soil disturbance should be implemented. These controls are set out in this CSMP and include but are not limited to:

- Workplace controls to prevent the spread of asbestos outside contaminated areas and site boundaries.
- Use of Personal Protective Equipment (PPE) appropriate to the work being undertaken.
- Monitoring and supervision of workplace activities by an appropriately qualified professional, including air monitoring; and
- Development, implementation, and updating of an CSMP.

Notification of Worksafe is not required based on the results of sampling conducted as part of the original 4Sight DSI and validation sampling undertaken by EAM NZ LTD, it is recommended that this is undertaken as a precautionary approach. An Asbestos Removal Control Plan (ARCP) will not be required as part of the works.

2 SITE LOCATION

2.1.1 EPL WHARF 7 REDEVELOPMENT SITE – SOURCE OF CONTAMINATED SOIL

The Wharf 7 site, is located at 11 Kaiti Beach Gisborne, Gisborne.

2.2 62 DUNSTAN ROAD - DISPOSAL SITE EXCESS CLEAN SOIL AND ASBESTOS IMPACTED SOIL.

The EPL Matawhero Aggregate Yard is located at 62 Dunstan Road, Gisborne. The site covers a total area of approximately 9.97 hectares and is legally described as Lot 1 DP 519719 (2.5 hectares).

The site is zoned Rural Industrial B Zone as per the GDC Combined Regional Land and District Plan (Operative 2006).

3.0 SOIL MANAGEMENT

Soil from the Wharf 7development site will be excavated into truck and trailer units. Note: The excavation, transport and placement of contaminated soil will be carried out by suitably qualified contractors. Once loaded, all soils will be wetted down to prevent the generation of dusts during transport.

- With respect to this CSMP contaminated soil refers only to soil sourced from the EPL Wharf 7 site that have been identified as follows:

- Only soils that contain asbestos below the soil asbestos investigation criteria of 0.001% w/w asbestos for Fibrous Asbestos (FA) and Asbestos Fines (AF) - for all land use scenarios; and
- Only soils that contain metals and hydrocarbons below the NESCS Soil Contaminant Standards for the land use scenario of Industrial/commercial outdoor worker (unpaved).

With regards to this CSMP, clean fill is as defined by MfE *Guide to the Management of Cleanfills* (2002) as follows:

"*Material that when buried will have no adverse effect on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of:*

- *Combustible, putrescible, degradable or leachable components.*
- *Hazardous substances.*
- *Products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices.*
- *Materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances.*
- *Liquid waste*."

In simpler terms clean fill includes materials such as uncontaminated soils, cured asphalt, bricks, unreinforced concrete, fibre cement building products (excluding asbestos) and glass.

The 62 Dunstan Road Site has historically been used for pastoral grazing and cropping only. As such the native soils do not contain natural concentrations of asbestos or hydrocarbons.

Note: If groundwater is encountered during excavations at the Dunstan Road Site, this will be pumped directly to the on-site sedimentation pond (if required). Groundwater is not expected as a result of earthworks.

- Hours of operation will be from 0600 to 1800 Monday to Friday and 0600 to 1400 on Saturdays.

- The Cartage Contractor will verify that all contaminated soils are tracked from the source location to 62 Dunstan Road. In addition, the waste haulage contractor will ensure:
- The waste haulage contractor will be appropriately licensed to transport the categorised materials (i.e., contaminated soils).
- Soils will be loaded into the haulage truck directly from the excavation area (or stockpile if these are required). The stockpile identifier, haulage truck identification number, and disposal location will be recorded.
- Truck loads will be covered (asbestos impacted soils will be covered in appropriate plastic (200-micron HDPE)) during transport to minimise the potential for generation of dusts and spillages during transit to the disposal site.
- If soil is spilt during loading or transport, the area will be immediately cordoned off, with spilled material removed from the area for subsequent disposal. If necessary, validation sampling of the spill area will be undertaken to confirm 'contaminated soils' have not cross-contaminated soils in the 'spill area'.
- Care will be taken during truck loads to avoid overloading trucks and soil spillage.
- Truck wheels will pass through a wheel wash prior to leaving the site to minimise the tracking of soil onto roadways.
- Following bulk earthworks across asbestos management areas of the site, all machinery and equipment will be decontaminated, and clearance swab sampling will need to be undertaken to confirm absence of asbestos on machines. Swab sampling of all equipment and machinery will ensure asbestos does not leave the site.
- Clearance swab sampling and reporting will be conducted in general accordance with the requirements of the MfE Contaminated Land Management Guidelines and BRANZ Guidelines. Swab samples will be analysed for asbestos and repeat sampling may be required until it can be demonstrated that equipment is deemed sufficiently clean.

4.0 SITE MANAGEMENT

- The following procedures are designed to assist with managing any potential environmental and/or human health risks associated with the excavation, transport and disposal of contaminated soil.
- These procedures are not intended to remove the responsibility of either the owner or contractor(s) of the health and safety of their workers, contractors or public, or their responsibility to protect the environment.

4.1 AIR MONITORING

- Although the soils to be discharged at the Dunstan Road Site are considered to contain asbestos below the soil asbestos investigation criteria of 0.001%, air monitoring will be carried out for the first week of this activity commencing (during placement of asbestos impacted soils. The SQEP shall determine if additional air monitoring is required after this duration.

- This will provide reassurance to GDC, site workers and the public that asbestos containing dusts are not being generated at the site.

- All air monitoring works will be performed in accordance with the *WorkSafe New Zealand guidelines for the management and removal of asbestos* (3rd Edition).

- The results will be discussed with GDC with the view of ceasing monitoring if the results are negative for asbestos.

4.2 SITE ACCESS AND SIGNAGE

Only authorised personnel can enter the site. To prevent unauthorised access to the site, fencing and signage will be put in place prior to works commencing.

All personnel will be briefed on the site health and safety and environmental management plans as well as this CSMP.

4.3 INDUCTION AND TRAINING

- All staff working at the Wharf 7 and Dunstan Road Sites will have training to raise their awareness of environmental issues, to understand their environmental responsibilities, the environmental hazards specific to their workplace and undertake their duties in a safe and environmentally responsible manner. In particular, this should involve the issues and hazards related to asbestos.

- To maintain and improve ALL staff (including Subcontractors, Labour Hire, Casuals, Transferring Staff, and Temps) awareness of environmental issues, understand their environmental responsibilities, and undertake their duties in an environmentally responsible manner the following mediums will be available:

- Formal skill training (including asbestos awareness training).

- On the job training and experience

- Toolbox meetings and discussion

- Contaminated Soils Awareness Training.

- Spill kit use and response training.

- Site Induction

4.4 CONTAMINANT DISCOVERY PROTOCOL

Previous sampling has shown that the soils to be transported and discharged at the Dunstan Road Site contain only low concentrations of asbestos (fibres) and metals. However, there is a possibility that unforeseen contaminants could be discovered during these works.

If other contaminated or potentially contaminated materials are discovered, work must be stopped in the area of contamination. Typical indicators of contamination may include:

- Discoloured soil.
- The presence of discoloured surface water or leachate (including sheens or slicks).
- Unusual odours, gas bubbles in pooled surface water.
- Oily substances.
- Presence of demolition materials or construction waste.
- Fibrous materials.

If newly discovered contaminated material is encountered, it will be placed on plastic, covered, and protected from storm water run-on and run-off. The site manager will consult with the Environmental Management Representative to evaluate the material and determine the appropriate disposition and course of action.

Should asbestos be observed or suspected during the excavation works, all work shall cease. At this point the Worksafe Approved Code of Practice (ACOP) (2016), Health and Safety at Work (Asbestos) Regulations (2015) and the New Zealand Guidelines for Assessing and Managing Asbestos in Soil BRANZ (2017) will be followed as applicable.

Works can recommence once all asbestos has been removed safely. Any such asbestos works (assessment, delineation, removal and verification) would be undertaken by a specialist asbestos contractor. A first response protocol for unexpected contamination is provided below:

1. **Stop work immediately and isolate work site from other site users (fencing, cones, taping off).**
2. **Advise site manager and Client representative**
3. **Implement agreed health and safety procedures (if not done so already)**
4. **Update the site hazard register.**
5. **Provide dust masks if asbestos suspected (if not done so already)**
6. **Where noxious or unpleasant odours are noted, cover the material with clean fill, impermeable liner to prevent nuisance to off-site receptors.**
7. **Establish dust, erosion and sedimentation controls**
8. **Contact site contamination specialist**

4.5 SEDIMENT AND STORMWATER RUNOFF CONTROLS

Sediment controls will be undertaken in accordance with the site-specific Erosion and Sediment Control Plan (ESCP), industry best practice, and in place of local erosion control guidelines, the Auckland Council ‘Erosion and sediment control guide for land disturbing activities in the Auckland region’ (2016). Erosion and sediment controls will be adequate to ensure that contaminated soil does not travel offsite.

Daily informal and weekly recorded inspections of erosion and sediment controls and the overall stormwater conveyance system will be carried out during on-site earthworks. Additional inspections will also be carried out in advance of, during and after high rainfall events.

4.6 DUST CONTROL PROCEDURES

Dust generated from the excavation of material has the potential to contain contaminants (specifically asbestos), and during windy conditions could migrate offsite. Dust must be managed during the excavation works to ensure that it generally complies with the Good Practice Guide for Assessing and Managing Dust, MfE (2016).

To control the generation of dust, the contractor will ensure that:

- All areas subject to soil disturbance activities are wetted and remain damp at all times during soil works, and until such time as existing soils have been covered with clean fill.
- When utilising water to control dust, the contractor will ensure that:
    - The volume of water used does not exceed soil field capacity of the wetted areas causing surface run-off that could discharge in the port basin; and
    - The application of water does not induce soil erosion and/or soil pugging.
- Plant access onto the works area is limited where possible; and
- Working in windy conditions is avoided.

A dust and odour complaints log will be maintained by the site contractor. If complaints regarding dust are received, the following information will be recorded:

- Time and date of the complaint.
- Name and location of the complainant.
- Weather conditions, description of site activities, and location of site activities.
- Nature of the complaint; and
- Mitigation measures undertaken and evaluation of effectiveness

4.7 STOCKPILING SOILS

If the contaminated soils are to be stockpiled onsite, stockpiled material will be managed by the contractor as follows:

- A bund will be constructed around the stockpile to minimise stormwater run-on and run-off; and
- Stockpiles will be wetted and maintained damp, and/or kept covered with plastic sheeting or a geotextile layer when material is not being added or removed to prevent mobilising asbestos fibres, erosion and dust generation.

5.0 HEALTH AND SAFETY

A Health and Safety Plan (HSP) for the proposed works will be documented and implemented by the contractor in accordance with the requirements of the Health and Safety at Work Act (2015), its amendments and any other applicable legislation, regulations, codes and guidelines.

The HSP will address all potential hazards associated with the proposed works, including those relating to potentially contaminated material, including asbestos.

The health and safety procedures described in this section of the CSMP shall be implemented by the contractor, in addition to those covered by their own HSP. Potential health and safety hazards associated with the potentially contaminated material onsite have been identified and mitigation measures identified in order to assist with the development of an appropriate site-specific HSP.

In the event of the discovery of unknown contamination, potential hazards along with their management and mitigation options will be revised. It is the responsibility of the contractor to implement these health and safety procedures.

5.1 PERSONAL PROTECTIVE EQUIPMENT

- Based on contaminant concentrations identified in the soil, there is a relatively low likelihood of encountering significant contamination during site development works and no special PPE over and above industry best practice is required. In particular, asbestos sampling and analysis shows that the concentrations are below the soil asbestos investigation criteria of 0.001% w/w asbestos for Fibrous Asbestos (FA) and Asbestos Fines (AF) - for all land use scenarios
- As a minimum, the following PPE will be mandatory for all personnel involved in ground disturbance activities where the potential for direct contact (including accidental contact) with contaminated materials exists:
- ▪ Wipeable safety footwear.
- ▪ Gloves (if soil is handled).
- Dust masks (P2 dust masks, if there is a potential for the generation of contaminated dust);
- ▪ Safety glasses.
- ▪ Hard hat (if working around plant); and
- ▪ Hi-vis vest.
- However, if further significant contamination is discovered during the earthworks, the PPE requirements will be reviewed accordingly.
- This operation will limit dust emissions at all times. Measures will be in place such as stabilisation, wetting down of disturbed areas and/or use of chemical dust suppressants. If dust is present due to unusually high winds all works will stop immediately until the operation can be completed without dust emissions from the work area.

6.0 CONTACTS

The following contact details are required to be filled out before the site works commence to ensure clear lines of communication are possible:

Table 1: Contact Details for Site Works at Matawhero Logyard, Gisborne		
Role	**Name/Organisation**	**Contact Number**
Client	EPL – James Gallagher	027 393 3394
Contractor Project Manager	James Gallagher s	027 393 3394
Site Manager/Supervisor	James Gallagher	027 393 3394
Gisborne District Council	GDC - Sally McKinnon	027 579 6857
Contaminated Land Specialist	EAM - Jason Strong	027 440 5990

7.0 REPORTING

Within three months of completing the above works a report will be supplied to GDC detailing the above process including the final capping arrangement. This report will contain as a minimum the volume of soil removed and placed at the Dunstan Road Site, the final capping parameters and results of validation sampling.

8.0 ONGOING SITE MANAGEMENT

The integrity of the capping layer(s) within should be continually reviewed by EPL. A thorough investigation will be carried out every five years to assess the integrity of the capping layer. A report detailing the findings and any remedial works carried out will be supplied to GDC within three months of the investigation being completed. This will be detailed in full in the Long-Term Management Plan.

APPENDIX A – LABORATORY RESULTS OF ANALYSIS

Hill Laboratories
TRIED, TESTED AND TRUSTED
R J Hill Laboratories Limited
101C Waterloo Road
Hornby
Christchurch 8042 New Zealand
T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	EAM NZ Limited	**Lab No:**	2714566	A2Pv1
Contact:	J Strong	**Date Received:**	24-Sep-2021	
	C/- EAM NZ Limited	**Date Reported:**	27-Oct-2021	
	233B Thompson Road	**Quote No:**	72316	
	RD 10	**Order No:**		
	Hastings 4180	**Client Reference:**		
		Submitted By:	J Strong	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight (g)	Dry Weight (g)	<2mm Subsample Weight (g dry wt)	Asbestos Presence / Absence	Description of Asbestos Form
#1 0-0.5m	2714566.1	405.8	373.2	57.7	Asbestos NOT detected.	-
#1 0.5-1.0m	2714566.2	326.2	260.0	51.0	Asbestos NOT detected.	-
#1 1.0-1.2m	2714566.3	329.9	264.8	53.7	Asbestos NOT detected.	-
#2 0-0.5m	2714566.4	449.2	396.1	52.5	Asbestos NOT detected.	-
#2 0.5-1.0m	2714566.5	249.5	213.7	58.1	Asbestos NOT detected.	-
#2 1.0-1.2m	2714566.6	293.6	256.2	50.2	Asbestos NOT detected.	-
#3 0-0.5m	2714566.7	422.4	396.0	53.6	Asbestos NOT detected.	-
#3 0.5-1.0m	2714566.8	579.7	496.8	51.2	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-8
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-8
<2mm Subsample Weight	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	-	1-8
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-8
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-8

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 27-Oct-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Rhodri Williams BSc (Hons)
Technical Manager - Asbestos