

# Eastern Busway

## EB2 and EB3 Residential

Contaminated Land Effects Assessment

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## List of Abbreviations and Definitions

Abbreviation and Definitions	Description
AEE	Assessment of Effects on the Environment
AUP(OP)	Auckland Unitary Plan (Operative in part) 2016
BPO	Best Practicable Option
CEMP	Construction Environmental Management Plan
CLMP	Contaminated Land Management Plan
CMA	Coastal Marine Area
EB1	Eastern Busway 1 (Panmure to Pakuranga)
EB2	Eastern Busway 2 (Pakuranga Town Centre)
EB3 Commercial/ EB3C	Eastern Busway 3 (Pakuranga Creek to Botany)
EB3 Residential/ EB3R	Eastern Busway 3 (SEART to Pakuranga Creek)
EB4	Eastern Busway 4 (link between Ti Rakau Drive and Te Irirangi Drive, Botany Town Centre Station)
EBA	Eastern Busway Alliance
HNZPT	Heritage New Zealand Pouhere Taonga
HNZPTA	Heritage New Zealand Pouhere Taonga Act 2014
km	Kilometre(s)
m	Metre(s)
m <sup>2</sup>	Square Metre(s)
m <sup>3</sup>	Cubic Metre(s)
MCA	Multi Criteria Analysis
NES-CS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES-FW	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NPS - FM	National Policy Statement for Freshwater Management 2020
NPS - UD	National Policy Statement for Urban Development 2020
NZCPS	New Zealand Coastal Policy Statement 2010
NoR	Notice of Requirement
AUP(OP)	Auckland Unitary Plan (Operative in Part) 2016
PWA	Public Works Act 1981
RTN	Rapid Transit Network
RRF	Reeves Road Flyover
RMA	Resource Management Act 1991
SEART	South-Eastern Highway

## Executive Summary

This technical report describes the assessment of contaminated land effects associated with the operation and construction of EB2 and EB3R. An Assessment of Environmental Effects (AEE) is required to support the resource consent application for EB2 and EB3R. This report assesses land within EB2 and EB3R and identifies if resource consent is required under the NES-CS and AUP (OP). Based on the information reviewed as part of this assessment, two sites were identified within EB2 and EB3R where contamination may be encountered during construction activities as part of the EBA project, which are the following:

- Land and carriageway adjacent to 3 Reeves Road (EB2)
- Carriageway adjacent 11 Cortina Place (EB3R)

### EB2

3 Reeves Road is currently occupied by an operating service station and therefore has been identified as having ongoing HAIL activities occurring on site. No previous environmental investigations detailing the state of groundwater and soil at 3 Reeves Road have been undertaken; therefore, as a conservative assumption it is reasonably likely for contamination to exist at 3 Reeves Road and migrating to adjacent land. The SSESCP indicated that approximately 250 m<sup>3</sup> of soil disturbance is required in the carriageway directly adjacent to the site for piling activities associated with the Reeves Road Flyover. Soil disturbance will likely exceed the permitted activity criteria for the NES – CS and AUP(OP) Chapter E30, therefore it is recommended discretionary consent should be sought for excavation activities occurring within the carriageway adjacent to 3 Reeves Road. Sampling within the carriageway and any potential effects to human health will be managed via a CLMP.

All remaining sites within EB2 identified as part of this assessment comply with the AUP(OP) permitted activity rules outlined in chapter E30 and the NES-CS.

### EB3R

Residual hydrocarbons are reasonably likely to be found within the carriageway adjacent to the former service station at 11 Cortina Place, due to migration via groundwater from an identified HAIL site, therefore the NES – CS and AUP(OP) will apply to the carriageway. As soil disturbance volumes are unlikely to meet permitted activity criteria for both the NES – CS and the AUP(OP) Chapter E30, consent is sought for a discretionary activity for works. Sampling within the carriageway and any potential effects to human health will be managed via a CLMP.

All remaining sites within EB3R identified as part of this assessment comply with AUP(OP) permitted activity rules outlined in chapter E30 and the NES-CS.

# 1 Introduction

## 1.1 Overview of the Eastern Busway Project

The Eastern Busway Project (the Project) is a package of works focusing on promoting an integrated, multi-modal transport system to support population and economic growth in southeast Auckland. This involves the provision of a greater number of improved public transport choices and aims to enhance the safety, quality and attractiveness of public transport and walking and cycling environments. The Project includes:

- 5km of two-lane busway
- New bridge for buses across Pakuranga Creek
- Improved active mode infrastructure (walking and cycling) along the length of the busway
- Three intermediate bus stations
- Two major interchange bus stations.

The Project forms part of the previous Auckland Manukau Eastern Transport Initiative (AMETI) programme (the programme) which includes a dedicated busway and bus stations between Panmure, Pakuranga and Botany town centres. The dedicated busway will provide an efficient rapid transit network (RTN) service between the town centres, while local bus networks will continue to provide more direct local connections within the town centre areas. The Project also includes new walking and cycling facilities, as well as modifications and improvements to the road network.

The programme includes the following works which are not part of the Eastern Busway Project:

- Panmure Bus and Rail Station and construction of Te Horeta Road (completed)
- Eastern Busway 1 (EB1) – Panmure to Pakuranga (completed)

The Eastern Busway project consists of the following packages:

- Early Works Consents – William Roberts Road (WRR) extension from Reeves Road to Ti Rakau Drive (LUC60401706); and Project Construction Yard at 169 – 173 Pakuranga Road (LUC60403744).
- Eastern Busway 2 (EB2) – Pakuranga Town Centre, including the Reeves Road Flyover (RRF) and Pakuranga Bus Station (**this Assessment**)
- Eastern Busway 3 Residential (EB3R) – Ti Rakau Drive from the South-Eastern Arterial (SEART) to Pakuranga Creek, including Edgewater and Gossamer Intermediate Bus Stations (**this Assessment**)
- Eastern Busway 3 Commercial (EB3 Commercial) – Gossamer Drive to Guys Reserve, including two new bridges, and an offline bus route through Burswood
- Eastern Busway 4 – Guys Reserve to a new bus station in the Botany Town Centre, including a link road through Guys Reserve.

The overall Project is shown in **Figure 1** below.



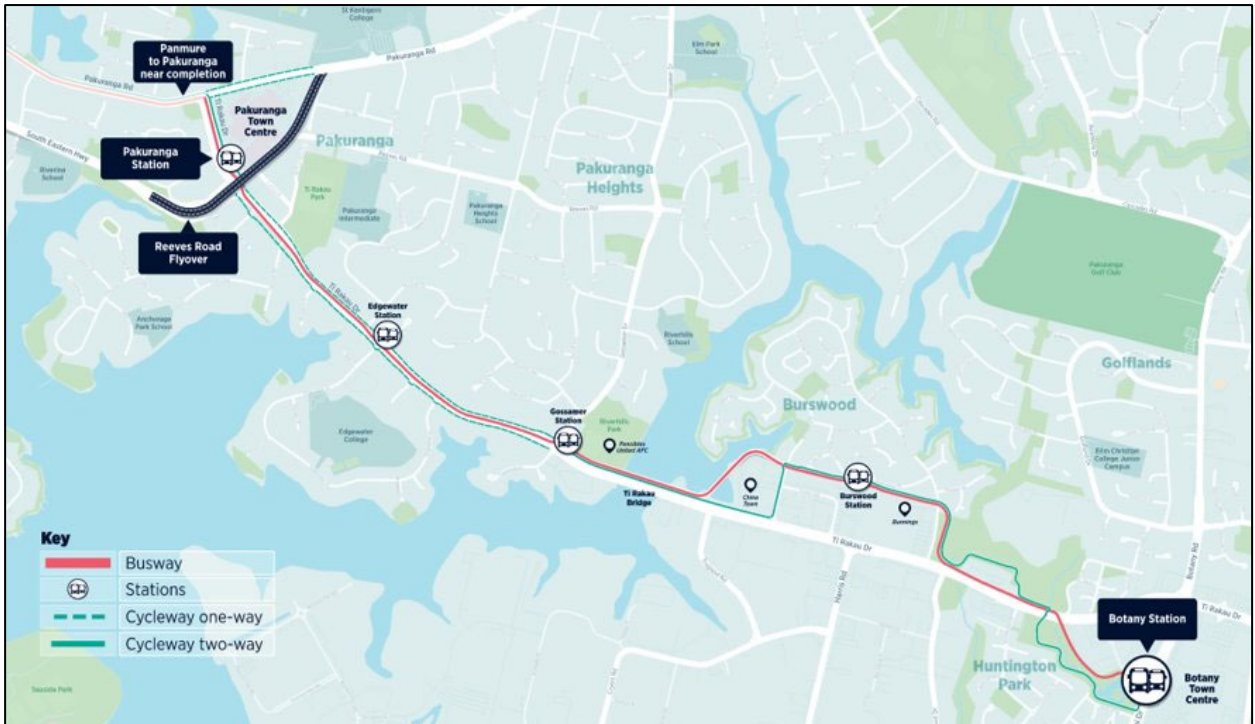


Figure 1. Project alignment

## 1.2 Project Objectives

The Project Objectives are:

1. Provide a multi modal transport corridor that connects Pakuranga and Botany to the wider network and increases access to a choice of transport options
2. Provide transport infrastructure that integrates with existing land use and supports a quality, compact urban form
3. Provide transport infrastructure that improves linkages, journey time and reliability of the public transport network
4. Contribute to accessibility and place shaping by providing better transport connections between, within and to the town centre
5. Provide transport infrastructure that is safe for everyone
6. Safeguard future transport infrastructure required at (or in vicinity of) Botany Town Centre to support the development of a strategic public transport connection to Auckland Airport.

The Project Objectives have been considered in relation to this assessment, with those particularly relevant to the assessment being Objective 2, given the potential for the disturbance of contaminated material to adversely affect existing land uses.

## 2 Proposal Description

The below is a summary of the works proposed within the EB2 and EB3R packages. Refer to the AEE for additional detail on the works proposed.

### 2.1 Eastern Busway 2

The EB2 section of the Project commences from the intersection of Ti Rakau Drive and Pakuranga Road, connecting with EB1, and traverses east along Ti Rakau Drive to the intersection of SEART. The north-south extent of EB2 is between SEART and Pakuranga Road along Reeves Road and William Roberts Road. The main components of EB2 are described below.

#### 2.1.1 Busway and Pakuranga Town Centre Bus Station

A segregated dedicated two-way busway is proposed along Ti Rakau Drive to provide prioritised access for bus services between Pakuranga Town Centre and Botany. From Pakuranga Road to SEART, the busway will run on the northern side of Ti Rakau Drive.

The proposed Pakuranga bus station is a key facility for services running to and from the Panmure Station Interchange, Howick, Highland Park, Eastern Beach, Bucklands Beach and Sunnyhills. The bus station will be located along the northern side of Ti Rakau Drive, on land currently occupied for Pakuranga Plaza and 26 Ti Rakau Drive. The bus station will feature two platforms and will contain a mixture of street furniture and structures, including bus shelters, electronic messaging signage and seating. New proposed pedestrian crossings will provide connections to the bus station and Pakuranga Plaza. Modifications to the Ti Rakau Drive median strip, landscaping, and general traffic lane reconfiguration will enable safe and efficient bus movement for the busway once it becomes operative.

#### 2.1.2 Reeves Road Flyover (RRF)

The RRF will provide two general traffic lanes in each direction connecting SEART to Pakuranga Road, to reduce local traffic congestion along Pakuranga Road and Ti Rakau Drive. The RRF will start opposite Paul Place Reserve, pass over Ti Rakau Drive and Reeves Road, before finishing at a new intersection with Pakuranga Road. Traffic lanes for the RRF will be elevated and run through the centre of SEART, requiring the relocation of the SEART off-ramp to the north of the existing off-ramp.

#### 2.1.3 Walking and Cycling Facilities

EB2 includes improvements to active transport infrastructure and connections. This includes a new cycleway, improved footpaths, and new pedestrian crossings. These works will improve the safety and connectivity of walking and cycling links across Pakuranga Town Centre.

#### **2.1.4 Supporting Works**

A range of works will be undertaken in support of the EB2 package. This includes the relocation of network utility services, new street lighting, earthworks, removal of vegetation, landscaping, stormwater upgrades, environmental restoration and mitigation and temporary construction sites.

## **2.2 Eastern Busway 3 Residential**

The EB3R section of the busway is a continuation of EB2 from the intersection of SEART and Ti Rakau Drive, with the proposed dedicated busway proceeding centrally along Ti Rakau Drive towards Gossamer Drive and Riverhills Park in the east. EB3R will largely occur within land vested as road or land currently owned by Auckland Transport. The construction of EB3R will take a staged approach to minimize disruption to the existing road network and its users. The main components of EB3R have been described below.

#### **2.2.1 Edgewater and Gossamer Intermediate Bus Stations**

EB3R includes two intermediate bus stations on Ti Rakau Drive, located within the vicinity of Edgewater Drive and Gossamer Drive. Both stations will have separate platforms for eastbound and westbound bus movements. A range of street furniture and structures will also be constructed, such as modular bus shelters pedestrian linkages, electronic messaging signage, seating and cycling storage facilities.

#### **2.2.2 Western Bridge Abutment**

EB3R includes construction of the western bridge abutment for a new future bridge across Pakuranga Creek. The abutment will be located within the area that is currently the south-eastern section of Riverhills Park. Only the bridge abutment is included in the EB3R package of works. The remaining parts of the bridge will form part of the EB3C approval package.

#### **2.2.3 Walking and Cycling Facilities**

Provision has been made for walking and cycling along the route of EB3R. This includes footpaths and uni-directional cycleways located on either side of Ti Rakau Drive from SEART to Gossamer Drive. Signalised pedestrian crossings will be provided at key intersections along Ti Rakau Drive, including adjacent to the proposed Edgewater bus station.

#### **2.2.4 Associated changes the road network**

The proposed changes to the road network include lane arrangement and intersection reconfigurations and changes to the parking arrangement and access to Edgewater Drive Shops. Changes are also proposed to the access arrangements for residential properties along the EB3R alignment. New westbound lanes for general traffic will be established within the land which has been acquired by Auckland Transport and will be vested as road once it becomes operative, as the busway alignment replaces the existing westbound lanes.

#### **2.2.5 Supporting Works**

A range of works will be undertaken in support of the EB3R package. This includes the relocation of network utility services, new street lighting, removal of vegetation, earthworks, landscaping, stormwater upgrades, environmental restoration and mitigation and temporary construction sites.

## 3 Specialist Assessment

### Chapter Summary

- *The purpose of this report is to inform the AEE relating to the Notice of Requirement (NoR), required regional consents and consents required under National Environment Standards for EB2; the AEE and district and regional consents applications for EB3R, including the identification of the ways in which any adverse effects will be mitigated.*
- *The excavation volumes for the project are detailed in the Erosion and Sediment Control Effects Assessment.*
- *Both the NES-CS and AUP(OP) are relevant to EB2 and EB3R due to soil disturbance activities occurring.*

### 3.1 Assessment Content

This report is a review and assessment of contaminated land effects associated with the operation and construction of EB2 and EB3R packages of the Eastern Busway project.

Its purpose is to inform the AEE relating to the Notice of Requirement (NoR), required regional consents and consents required under National Environment Standards for EB2; the AEE and district and regional consents applications for EB3R, including the identification of the ways in which any adverse effects will be mitigated.

This contaminated land assessment:

- Assesses whether sites within EB2 and EB3R have been subject to contaminating activities (if applicable) including the location(s) and type(s) of these activities
- Assesses the potential significance of the identified sources and the potential implications in relation to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES-CS)<sup>1</sup>
- Provides general commentary on AUP (OP) rules in relation to contamination
- Provides a general assessment of the potential effects of works within EB2 and EB3R on human health and the environment, and the potential mitigation measures to avoid, remedy or mitigate those effects (in relation to contamination effects)

This contaminated land assessment involves the:

- Review and assessment of previous environmental investigations in the vicinity of EB2 and EB3R
- Review of publicly available historical aerial photographs
- Review of Auckland Council (AC) contaminated land enquiry
- Assessment of the potential extent of contamination present/not present, specifically in relation to EB2 and EB3R
- Identification of suitable disposal locations for the removed soil, if required, as part of a Contaminated Land Management Plan (CLMP).

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<sup>1</sup> MfE, 2011 – National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health.

This report has been completed in general accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines No. 1, 'Reporting on Contaminated Sites in New Zealand', Revised 2021<sup>2</sup>.

## 3.2 Specific Project Elements

The Erosion and Sediment Control Effects Assessment<sup>3</sup> (ESCEA) details areas within the proposed EBA packages where excavation during works is required.

### 3.2.1 EB2 Package

It is understood that the approximate total volume of excavation in the EB2 package is 52,000 m<sup>3</sup>, which comprises of 30,000 m<sup>3</sup> of cut and 22,000 m<sup>3</sup> of fill.

As part of the EB2 package, a Flyover (RRF) along Reeves Road is proposed, which runs from the South-Eastern Arterial (SEART) to Pakuranga Road. Excavation for piling will be required along Reeves Road for which approximately 250 m<sup>3</sup> of soil disturbance will be required for each pile.

### 3.2.2 EB3R Package

It is understood that the approximate total volume of excavation in the EB3R package is 52,000 m<sup>3</sup>, which comprises of 20,000 m<sup>3</sup> of cut and 32,000 m<sup>3</sup> of fill.

Approximately 1150 m<sup>3</sup> of proposed excavation is required for removal and replacement of pavement surfaces within the site directly south of 11 Cortina Place. The area comprises of 1,350 m<sup>2</sup> in the carriageway and 2,050 m<sup>2</sup> in the residential area south of Ti Rakau Drive (an area of approximately 3,400 m<sup>2</sup> in total). Further, approximately 150 m<sup>3</sup> of material will be required to be disturbed for stormwater service trenches and approximately 100 m<sup>3</sup> for the common services trench on the southern side of Ti Rakau Drive. In total for the works south of Cortina Place approximately 1,400 m<sup>3</sup> of material will be disturbed as part of the proposed works over a total area of 3,400 m<sup>2</sup>.

It should be noted that these are approximate volumes given at the time of reporting.

## 3.3 Regulatory Requirements

As part of this assessment, consent may be required under the NES-CS and AUP(OP) if a piece of land disturbed as part of works within EB2 and EB3R has been subject to HAIL activities.

### 3.3.1 NES-CS

The NES-CS is designed to ensure that the land affected by contaminants in soil is appropriately identified and assessed when particular activities are undertaken, such as soil disturbance (Regulation 5(4)), and that the effects of activities occurring on a piece of land that may cause risk(s) to human health are managed (Regulation 5(7)).

Regulation 5 (7) of the NES-CS describes land subject to the Regulations as:

*(7) the piece of land is a piece of land that is described by 1 of the following:*

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<sup>2</sup> MfE, 2011 – Contaminated land management guidelines No 1, Reporting on contaminated sites in New Zealand. Revised 2021.

<sup>3</sup> Site Specific Erosion and Sediment Control Plan, Eastern Busway Alliance

- (a) an activity or industry described in the Activities and Industries List (HAIL) is being undertaken on it*
- (b) an activity or industry described in the HAIL has been undertaken on it*
- (c) it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.*

The Ministry of Environment (MfE) has developed the HAIL<sup>4</sup>, which is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage, or disposal, both currently and historically. The HAIL is intended to identify activities or industries where hazardous substances have the potential to cause soil and groundwater contamination. The HAIL groups similar industries together, which typically use or store hazardous substances that could cause contamination if these substances escaped from safe storage, were disposed of on the site, or were lost to the environment through use. If the proposed activity is on, or intersects with, a piece of land that currently has, or has had, a HAIL activity on it, then the NES-CS applies. Regulation 3 categorises certain land uses within the HAIL. Pertinent to this assessment is HAIL category H for adjacent sites. Category H is defined as ‘any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment’.

### **3.3.2 Auckland Unitary Plan – E30 Contaminated Land**

This section of the AUP(OP) addresses the effects of the discharge from contaminated land or land containing elevated levels of contaminants into air, or into water, or into land under section 15 of the Resource Management Act 1991. Chapter E30 of the AUP(OP) is relevant to EB2 and EB3R due to the potential discharges associated with soil disturbance that may liberate contaminants.

This assessment supports the resource consent applications and obligations under the NES-CS and Chapter E30 (of the AUP(OP)) for any HAIL sites identified within the EB2 and EB3R work areas.

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<sup>4</sup> *Hazardous Activities and Industries List (HAIL)*. Ministry for the Environment, October 2011

## 4 Methodology

### Chapter Summary

- *To meet the contaminated land assessment objectives, previous environmental investigation reports, historical aerial photographs, and an Auckland Council (AC) site contamination enquiry report were reviewed.*

As part of this report previous environmental investigation reports, historical aerial photographs, and an Auckland Council (AC) site contamination enquiry report were reviewed. Impact from previous and/or current HAIL activities identified and recommendations in previous investigations were then taken into consideration to provide a general assessment of the potential effects of the work, and the potential mitigation measures to avoid, remedy or mitigate those effects (in relation to contamination effects).

### 4.1 Previous Environmental Investigations

Environmental investigation reports available for sites with HAIL activities within EB2 and EB3R have been reviewed as part of this assessment to determine if they have been subject to contaminating activities. The available previous environmental investigation reports are included in **Appendix A**.

### 4.2 Aerial Photographs

A review of publicly available historical aerial photographs has been conducted in the vicinity of EB2 and EB3R, to identify historical or current HAIL sites not identified in previous environmental investigations. Historical aerial photographs were reviewed from the Retrolens Historical Image Resource<sup>5</sup>, Auckland Council's GeoMaps online portal<sup>6</sup> and Google Earth Pro online services<sup>7</sup> in conjunction with Google Maps<sup>8</sup>.

Copies of available historical aerial photographs are included in **Appendix B**.

### 4.3 AC Contamination Enquiry

Information received from an AC site contamination enquiry report, based on records and information currently held by AC's Natural Resources and Specialist Input Unit Records was reviewed. This includes data on landfill bores, air discharge, industrial and trade process consents and environmental assessments within the boundaries of EB2 and EB3R. A copy of the AC contamination enquiry and relevant environmental reports are included in **Appendix C** and **Appendix D**.

<sup>5</sup><https://retrolens.co.nz> accessed 11 November 2021

<sup>6</sup><https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html> accessed 11 November 2021

<sup>7</sup> Goggle Earth Pro accessed 11 November 2021

<sup>8</sup> <https://www.google.com/maps> accessed 11 November 2021

## 5 Existing Environment – Eastern Busway 2

### Chapter Summary

- *Based on the information reviewed, there are eight sites within EB2 where HAIL activities were identified, and asbestos was confirmed to be present in the Seven Oaks Drive residential area.*

### 5.1 Previous Environmental Investigations

To assess the features and values potentially impacted by the proposal, a review of previous environmental investigations in the vicinity of EB2 has been undertaken. The following reports were reviewed and are summarised below:

- Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), June 2000
- Phase 1 PSI for the Pakuranga Scheme Assessment of the Auckland Manukau Eastern Transport Initiative (AMETI) Alignment, prepared by GHD Limited (GHD), 7 December 2012
- Previous Investigation at 3 Kentigern Close:
  - Tank Removal TR07/774, Site No 002021, Pattle Delamore Partners Limited (PDP) – August 2008
  - Environmental Site Assessment (ESA) (Stages 1 & 2), Fraser Thomas Limited – August 2009.
- Data Gap Analysis, Environmental Sampling (AECOM) – 2018
- Asbestos sampling (AECOM) – 2021.

#### 5.1.1 Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), dated June 2000.

During GHD 's 2000 Landfill Assessment Report, the closed landfills throughout the Manukau City region were reviewed to ensure the necessary resource consents were in place. From information provided by the Manukau City Council (MCC), historical records revealed that 39 closed landfill sites existed within the MCC owned property. GHD evaluated each site to determine the potential for adverse environmental effects to clarify which sites may require resource consents from Auckland Council (previously known as Auckland Regional Council (ARC)).

The assessment was carried out based on the following key criteria:

- Age of the landfill
- Type of fill
- Leachate discharge
- Proximity to water courses
- Hydraulics, water level and rainfall
- Leachate toxicity risk factor (LRF).

During the assessment, GHD used the LRF as one of the key indicators for identifying sites that may pose significant risk to the environment and may require resource consent for discharge of leachate. The LRF is the measured concentrations of contaminants in the leachate expressed as a ratio of relevant standards or guidelines to assess the relative risks to the environment from the landfill discharges. In the case of this report, GHD used the following five parameters for the ratio: cadmium, chromium, lead, ammonia-nitrogen, and total nitrate levels.



The investigation and monitoring were carried out in accordance with the Australia and New Zealand Environmental and Conservation Council (ANZECC) guidelines for contaminated sites, leading to more targeted and detailed investigations on those sites that required further work. Preliminary investigations involved a screening process in which surface water and groundwater samples were collected from selected sites between August 1994 and November 1996.

Following the screening process, GHD selected high priority landfills based on the key indicators, with subsequent groundwater bores installed on sites between December 1995 and February 1996. GHD monitored landfill gases during drilling to ensure the concentrations were lower than the lower explosive limit (LEL), the concentration of gas required to support combustion. At no times did the gas levels recorded in any bore exceed the LEL.

Further details on the investigation methodology are included in the report included in full in **Appendix A**.

From the sites evaluated in the report, Dale Crescent Reserve was identified as a closed landfill within EB2.

The key findings and conclusions of the assessment relevant to EB2 are as follows:

- There was no record of any landfills having a specifically engineered clay cap, liner and or base. Anecdotal evidence suggests that the landfills were established on top of existing ground, which was confirmed during the drilling of the groundwater bores
- All landfills were generally underlain to a variable depth and with variable quality of silt or clay type medium of unknown permeability
- None of the landfills within EB2 had a leachate collection system installed during infilling
- The fill type at Dale Crescent was listed as cleanfill and gravel<sup>9</sup>
- The site is approximately 100 m from the nearest watercourse (Tāmaki River)
- Four bores were advanced at Dale Crescent. During bore drilling, soil materials consisted of gravel, silt and clay to depths between 1 and 1.25 m bgl. Groundwater was intercepted at depth greater than 2 m bgl
- Dale Crescent was given an LRF of 7.5<sup>10</sup>, above the maximum acceptable value (MAV) of 5. It was noted the ammonia levels and landfill gases at this site were higher than most of the others evaluated. This was surprising given no refuse was found during drilling, although bore logs indicated there may have been organic material beneath the fill during earthworks operations, which may have influenced leachate concentrations and gas emissions. GHD concluded that considering Dale Crescent was filled with cleanfill and gravel only and is not in close proximity to any watercourses, any environmental risk from the site is considered to be not significant and should be excluded from any need for resource consent.

#### **5.1.2 Phase 1 PSI for the Pakuranga Scheme Assessment of the Auckland Manukau Eastern Transport Initiative (AMETI) Alignment, prepared by GHD Limited (GHD), dated 7 December 2012.**

During their 2012 assessment, GHD reviewed packages EB2, EB3R, EB3C and EB4, areas previously referred to as Packages 3 & 4 by the assessment. The purpose of the PSI was to support AT in meeting the requirements of the NES-CS as it applies to ‘a piece of land’. As such, the objective of the PSI was to

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<sup>9</sup> Table 8, Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), dated June 2000.

<sup>10</sup> Table 9, Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), dated June 2000.

assess the likelihood of the presence of soil contamination resulting from historical and/or current land use activity within or adjacent to the EBA packages.

The PSI comprised of a review of information from the following sources:

- Draft alignment plans as of October 2012 developed by GHD/Aurecon
- Selected publicly available historical aerial photographs from 1940 to 2010
- Collection of photographs as part of a walkover conducted on 26 September 2012
- AC contaminated sites register
- AC groundwater borehole register
- Readily available site investigation reports resulting from site register search
- Readily available geology and hydrogeology information
- Publicly available information on the environmental fate of contaminants
- Identification of sensitive human and/or environmental receptors.

GHD presented the following key findings and conclusions relevant to EB2:

- Along the length of the EBA packages there are a number of geological units present with the most prominent being rhyolitic pumiceous deposits of the Tauranga Group Engineered construction fill (likely comprising re-compacted clay/gravel and may include construction and demolition wastes) is noted in a large complex between Ti Rakau Drive and Pakuranga Road
- A site contamination enquiry was completed, seeking records from AC. Numerous items were identified including pollution incidents, records of discharge consents, submittal of an environmental site assessment (ESA) reports for a service station facility, and borehole installation records for environmental monitoring or investigation purposes at two sites (one service station and one chemical supplier facility)
- A walkover identified no sensitive receptors in close proximity to the EBA packages
- GHD identified seven HAIL sites along EB2. The report stated that, given significant soil will be disturbed along the EBA packages the regulations of the NES-CS apply on the basis of HAIL category H adjacent sites. Category H is defined as ‘any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment’. The identified HAIL sites are detailed in **Table 1** below.

Table 1- Summary of HAIL Sites within EB2 (GHD 2012)

Site Name	Landuse Activity	HAIL Category
3 Kentigern Close / 102 Pakuranga Road	Former service station, now a commercial complex	F7 – Service stations including retail or commercial refuelling activities
141 Pakuranga Road	Service station	F7 – Service stations including retail or commercial refuelling activities
Pakuranga Plaza, Aylesbury Street, Pakuranga Town Centre	New Zealand Dry Cleaners	A5 – Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents
12 Cortina Place*	Pakuranga Panel Beaters	F4 – Motor vehicle workshops
16 Cortina Place*	Pakuranga Automotive	F4 – Motor vehicle workshops
16D Cortina Place*	Pakuranga Auto Transport	F4 – Motor vehicle workshops
3 Reeves Road	Service station	F7 – Service stations including retail or commercial refuelling activities

\*Note: Indicates sites detailed in the William Roberts Road Extension Contaminated Land Technical Report.

### 5.1.3 Previous Investigation at 3 Kentigern Close

A timeline of investigations at the former service station located at 3 Kentigern Close is presented below. The reports are attached in full in **Appendix A**.

#### **Mobil Pakuranga, 102 Pakuranga Road, Manukau City, Auckland – Tank Removal TR07/774, Site No 002021, Pattle Delamore Partners Limited (PDP) – August 2008.**

The scope of work included the removal of 4 x Underground Storage Tanks (USTs), which comprised of 1 x 40,00 L diesel UST, 3 x 40,000 L petrol USTs, associated pipework, dispensers and vents removed from the former Mobil Pakuranga. A total of nineteen test pits were also excavated in order to assess soil quality in the vicinity of the Underground Petroleum Storage System (UPSS) components, in locations where historic USTs were thought to be located and in areas where a mechanics workshop may have historically been located.

In their report, PDP noted no obvious petroleum hydrocarbon staining was observed in the bedding material during the removal of the UPSS. Visual and olfactory evidence of hydrocarbon contamination was noted within soils excavated during test pitting activities. PDP reported that a total of 143 tonnes of petroleum hydrocarbon impacted material was removed from site and disposed of at a licensed facility for contaminated waste.

All soil samples collected from the site returned concentrations of total petroleum hydrocarbon (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX) below the Oil Industry Guidelines Tier 1 Soil Acceptance Criteria via All Pathways for commercial/industrial land use.

Three soil samples taken from the tank pits were analysed for Heavy Metals. The reported concentrations were all below the AC Permitted Activity Criteria and the Auckland Background Concentrations (Volcanic).

PDP concluded that no resource consent was required for the residual soil concentrations at the site.

#### **102 Pakuranga Road, Manukau City, Environmental Site Assessment (ESA) (Stages 1 & 2), Fraser Thomas Limited (Fraser Thomas) – August 2009.**

In their 2009 ESA, Fraser Thomas assessed and investigated any actual or potential site contamination issues as a result of previous uses of the site at 102 Pakuranga Road.

During their ESA, Fraser Thomas noted that the 2008 tank removal report from PDP had been reviewed by ARC and that a Certificate of Compliance (CoC) had been issued. However, Fraser Thomas highlighted that the site had been refurbished in 1989, with works including the demolition and removal of existing buildings, USTs and fuel pumps. It was understood that a tank removal report was not prepared for these activities and a site investigation with soil sampling was not conducted. The ESA indicated that no test pit investigation, soil sampling or groundwater sampling had occurred in the location of two large historical USTs shown in the 1989 Mobil Demolition Plan. In order for the site owners to obtain a CoC, Fraser Thomas completed a test pitting programme and installed groundwater sampling piezometers in the vicinity of the historical USTs. Soil and groundwater samples were collected to determine heavy metal, TPH and BTEX concentrations and the presence of separate phase hydrocarbons was checked in the piezometers.

Fraser Thomas presented the following results from their soil and groundwater ESA:

- Petroleum hydrocarbon concentrations from soil samples collected did not exceed the Proposed Auckland Regional Plan for Air, Land and Water (PARP: ALW 2008) Tier 1 guidelines
- All Heavy Metal concentrations in soil samples collected met the permitted activity criteria listed in schedule 10 of the PARP: ALW (2008)
- Groundwater sampling indicated that contamination of groundwater at the site was not occurring. The groundwater sampling results confirmed that the environmental effect of the hydrocarbons noted in excavations to the south and east of the forecourt are less than minor and have not impacted groundwater.

In conclusion, Fraser Thomas determined that based on the evidence presented in both the PDP 2008 tank removal report and their 2009 ESA, the site was deemed to meet permitted activity criteria as detailed in the PARP: ALW (2008).

#### 5.1.4 Environmental Sampling (AECOM) – 2019

In 2019, following recommendations of the 2012 PSI completed by GHD (section 5.1.2), AECOM undertook a Gap Analysis in support of the application for resource consents associated with soil disturbances for the proposed alignment. The Gap Analysis identified areas where further investigation was required. Between February 2019 and April and August 2019, six boreholes (advanced for geotechnical purposes) and thirty-three environmental hand augers were completed within the wider EBA works, of which fourteen soil samples were collected from eight hand augers and one borehole within EB2 at depths between 0.1 and 1.3 m bgl.

Samples were analysed for the following contaminants:

- Heavy metals
- Total petroleum hydrocarbons (TPH)
- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)
- Polycyclic aromatic hydrocarbons (PAHs)

The environmental assessment focussed on the collection of soil samples for laboratory analysis from materials within anticipated areas of soil disturbance. The analytical results from samples collected from locations within the EB2 package are presented in **Table A1** in **Appendix A**. Soil samples were analysed for contaminants associated with the HAIL activities at or in the vicinity of the EB2 package (listed in **Table 2** below). The investigation locations relevant to the EB2 package are presented in **Figure 2** below.

The Data Gap Assessment is included in section 3.0 of the Draft Environmental Assessment in **Appendix F**.



Figure 2: 2018 Environmental Investigation Locations within EB2.

Table 2 - Summary of sample locations from 2018 Environmental Investigation

Sampling Location	Rationale	Sampling Location	Rationale
EHA103	Area of proposed soil disturbance	EHA107	Area of proposed soil disturbance
EHA104	Area of proposed soil disturbance	EHA108	Area of proposed soil disturbance
EHA105	Pakuranga Panel Beaters (12 Cortina Place)	EHA118	Near Former New Zealand Dry Cleaners (Pakuranga Plaza)
EHA106	Area of proposed soil disturbance	EHA121	Area of proposed soil disturbance

A summary of the soil analytical results in EB2 is as follows:

- All analytical results were below criteria for NES-CS, Oil Industry Guidelines and Permitted Activity Criteria
- All TPH, BTEX and SVOC concentrations were below the laboratory limit of reporting (LOR)
- Minor concentrations of PAHs were recorded at EHA106 at a depth of 0.5 m below ground level (bgl), however concentrations were below all of the relevant benchmarking criteria. All other samples analysed for PAHs were below the laboratory LOR
- Heavy Metal concentrations from all sample analytical results were below the Auckland Background Concentrations (non-volcanic), with the exception of a surface sample collected at EHA107, which was above the Auckland Background Concentrations for lead.

### 5.1.5 Asbestos sampling (AECOM) - 2021

During geotechnical works associated with EB2 in October 2021, an AECOM staff member discovered possible fragments of Asbestos Containing Materials (ACM). The material was collected at a depth of 1 m bgl by a public walkway at the end of Seven Oaks Drive (a residential area in Pakuranga). The fragments were double bagged and sent to Hill Laboratories for analysis, which confirmed the presence of ACM. Following the discovery of ACM, AECOM abandoned the geotechnical works in the area of Seven Oaks Drive. The lab report and photographs of the sample location are included in **Appendix E**.

### 5.1.6 1R Dale Crescent, Soil Quality Assessment, EBA, March 2022.

The Soil Quality Assessment was completed as part of a land transfer from Waka Kotahi to Auckland Council to better understand soil quality at 1R Dale Crescent. The Site is understood to contain fill material deposited during the construction of the Pakuranga Highway and therefore identified as a closed landfill site. Works included the advancement of five test pits to 2.0 m bgl from which twelve soil samples were submitted to Hill laboratories for analysis of the following:

- Two shallow soil samples considered to be representative of shallow fill materials were analysed for asbestos (using the BRANZ Guidelines for Semi Quantitative Asbestos in Soil analysis methodology)
- Five soil samples taken from between 0.2 m bgl and 1.8 m bgl were analysed for heavy metals
- Five soil samples were analysed for TPH from between 0.5 m bgl and 2.0 m bgl
- Two soil samples were analysed for SVOCs from between 0.4 m bgl and 0.75 m bgl.

The following field observations were noted during excavation of the test pits:

- Soil primarily comprised of clays, silts and sand
- A metal fragment was observed in TP4 however, no other refuse was discovered during the remaining excavation
- Soil headspace VOC concentrations in bagged samples ranged between 0.0 ppm and 2.0 ppm
- No visual or olfactory evidence of impact was noted in soil samples collected from the test pits
- No fragments of potentially asbestos containing material (ACM) were noted in any of the fill material within the test pits
- Groundwater was not encountered during excavation at TP1-TP4. Groundwater was encountered at 1.6 m bgl at TP5.

Analytical results from the samples collected from TP1-5 are summarised below:

- Analytical results from samples collected from TP1 (at a depth of 1.8 m bgl) returned copper and chromium concentrations above the Auckland Background Concentrations (non-volcanic), however results were below criteria for the NES–CS and AC Permitted Activity Criteria
- Samples collected from TP2-5 returned heavy metals concentrations consistent with Auckland Background Concentrations, with the exception of samples EBA\_TP3\_0.4 and EBA\_TP4\_0.0-0.15 returning nickel concentrations above Auckland Background Concentrations
- Minor hydrocarbons were detected in samples EBA\_TP1\_2.0 and EBA\_TP5\_1.5, however concentrations were below Oil industry Guidelines
- All samples returned results below the NES–CS and AC Permitted Activity Criteria
- Samples collected from TP2 and TP4 returned concentrations of SVOCs below the laboratory LOR.

A copy of the report is included in full in **Appendix H**.

## 5.2 Aerial Photographs

Historical and current aerial photographs were obtained through the AC GeoMaps online portal, the Retrolens online portal and Google Maps. A review of aerial photographs was undertaken for the period 1939 through to the present day. This allowed for the determination of land use changes and the identification of any pertinent items that have become apparent since the PSI in December 2012, but also to allow for the identification of any pertinent land uses that may have been omitted during the development of previous environmental investigations. The aerial photographs are included in **Appendix B**.

The review of aerial photographs highlighted the following key items:

- Much of the land is undeveloped farmland in the 1939 aerial photograph, with the exception of multiple residential dwellings and ancillary farm buildings
- Development of Pakuranga Plaza and surrounding commercial/residential buildings occurred sometime between 1939 and 1968
- A building has been constructed at 141 Pakuranga Road between 1939 and 1968, however the land use isn't clear. Google Street View indicates the site was developed into a service station sometime prior to 2008
- There is a building located at or within the vicinity of 3 Kentigern Close in the 1968 aerial photograph. The 1996 aerial photograph indicates the site was redeveloped sometime between 1988 and 1996. The 2010 aerial photograph indicates that some of the structures seen in the 1996 aerial are still present, however exposed soils in the northwest corner of the site indicate excavation has occurred in the site and a structure has been removed in the northern portion of the site. The 2015 aerial photograph indicates the site was redeveloped sometime between 2010 and 2015
- Infilling for Highway 10 southwest of Ti Rakau Drive begun between 1968 and 1972, with a number of residential buildings removed around the Dale Crescent / Paul Place Reserve for the development. Land has been reclaimed south of Highway 10 on an inlet of the Tāmaki River. Dale Crescent / Paul Place reserve have been filled during the works
- A building located at 12 Cortina Place is present in the 1968 aerial photograph
- On the 1972 aerial photograph buildings are present at 16 and 16D Cortina Place. The buildings have been constructed sometime between 1968 and 1972
- A large, grassed area visible northwest of Dale Crescent / Paul Place Reserve, in the 1972 aerial photograph, has been replaced with residential housing in the 1980 aerial photograph
- Highway 10 appears to be complete in the 1980 aerial photograph
- The building located at 13 Cortina Place is no longer present in the 2017 aerial image. The site is currently a carpark.

## 5.3 Auckland Council Contamination Enquiry

The following details the information received from the AC contamination enquiry in relation to EB2:

- There is one closed landfill site within EB2, located at Dale Crescent (1R Dale Crescent, Pakuranga. The site is detailed as previously being used for cleanfill disposal
- A 2008 tank removal report and 2009 ESA pertaining to the former service station located at 3 Kentigern Close

A copy of the AC contamination enquiry is included in **Appendix C**.

## 5.4 EB2 Package Summary

Based on the information reviewed, there are eight sites within EB2 where HAIL activities were identified, and asbestos was confirmed to be present in the Seven Oaks Drive residential area. These sites are summarised in **Table 3** and the potential for contamination to be encountered is detailed in the following sub-sections. It should be noted sites identified within the William Roberts Road extension have not been detailed in the following subsections. For further details on those sites, refer to the William Roberts Road Extension Contaminated Land Technical Report in **Appendix D**.

Table 3 - Summary of findings within EB2.

Site Name/Location	Landuse Activity	HAIL Category	Comments
3 Kentigern Close / 102 Pakuranga Road	Former service stations, now a commercial complex	F7 – Service stations including retail or commercial refuelling activities	Site investigated. No contamination encountered.
Pakuranga Plaza, Former New Zealand Dry Cleaners	Former dry cleaner	A5 – Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents	No soil disturbance planned at or adjacent to this location.
Dale Crescent/Paul Place Reserve	Closed landfill site	G3 – Landfill sites	Site investigated. No contamination encountered.
141 Pakuranga Road	Service station	F7 – Service stations including retail or commercial refuelling activities	No soil disturbance planned at or adjacent to this location.
3 Reeves Road	Service station	F7 – Service stations including retail or commercial refuelling activities	No site investigation. Potential for migration of contaminants into area of soil disturbance within EB2.
12 Cortina Place*	Pakuranga Panel Beaters	F4 – Motor vehicle workshops	Addressed in William Roberts Road Extension Contaminated Land Technical Report.
16 Cortina Place*	Pakuranga Automotive	F4 – Motor vehicle workshops	
16D Cortina Place*	Pakuranga Auto Transport	F4 – Motor vehicle workshops	

\*Note: Indicates sites detailed in the William Roberts Road Extension Technical Report

### 5.4.1 3 Kentigern Close

As detailed in **Section 5.1.3** this site is the location of a former service station. Investigations in 2008 and 2009 identified there was no impact to soil or groundwater from contaminants and the site met the permitted activity criteria under the former PARP: ALW (2008). Therefore, this site is considered unlikely to be a significant source of contamination during the EB2 works.

### 5.4.2 Former New Zealand Dry Cleaners

The 2012 PSI<sup>11</sup> identified New Zealand Dry Cleaners as a site with HAIL activities within EB2. The New Zealand Dry Cleaners is no longer present at the site. Planned soil disturbance works for EB2 are considered to be a sufficient distance from the Former New Zealand Dry Cleaners site and therefore impact to soil to be disturbed is considered unlikely.

<sup>11</sup> GHD Limited, 2012, Phase 1 PSI for the Pakuranga Scheme Assessment of the Auckland Manukau Eastern Transport Initiative (AMETI) Alignment, dated 7 December 2012.



### 5.4.3 Dale Crescent

The 2000 Landfill Assessment Report identified this site as a closed landfill. The investigation indicated no refuse was discovered during intrusive activities and the site was recorded as filled with cleanfill materials. From onsite monitoring, elevated leachate and landfill gas levels were noted, however, bore logs indicated this may have been caused by naturally occurring organic material beneath the cleanfill. GHD concluded that any environmental risk from the site is considered to be not significant and should be excluded from any need for resource consent.

In 2018, AECOM collected soil samples from Dale Crescent (DH102) and analysed for Heavy Metals and pesticides. All concentrations of Heavy Metals returned results in accordance with Auckland Background Concentration (non-volcanic range). All concentrations of SVOCs returned results below the laboratory LOR.

Twelve soil samples were collected from five test pits across Dale Crescent as part of a 2022 Soil Quality Assessment. Minor concentrations of copper, chromium and nickel were detected in soil samples above Auckland Background Concentration (non-volcanic), however all samples collected returned results below the NES – CS, AC Permitted Activity Criteria and the Oil Industry Guidelines.

As per the ESCEA, Dale Crescent is an area of potential cut and fill. From the information reviewed above, this site is unlikely to be a significant source of contamination.

### 5.4.4 141 Pakuranga Road

This site was identified in the 2012 PSI as a service station. Planned soil disturbance works for EB2 are considered to be a sufficient distance from the service station and therefore impact to soil to be disturbed is considered unlikely.

### 5.4.5 3 Reeves Road

GHD identified the service station as a site with HAIL activities in their 2012 PSI. A request to the AC contaminated land team returned no environmental investigation pertaining to 3 Reeves Road. As soil and groundwater quality are unknown, a conservative assumption is to consider 3 Reeves Road reasonably likely for contamination to be present and migrating offsite.

The service station is located directly adjacent to the proposed RRF where piling is proposed. As per HAIL Category H (described in **Section 3.3**), the area of soil disturbance associated with piling for the RRF is directly adjacent and down-gradient from the service station and therefore is considered a 'piece of land' under the NES-CS and consent is required. A proposed piling plan is attached in **Appendix G**, which details the proximity of the soil disturbance area to the service station.

**Section 3.2.1** indicates approximately 250 m<sup>3</sup> of soil disturbance will be required for the piling works adjacent to 3 Reeves Road (within the Reeves Road carriageway). Therefore, this portion of the works will exceed the permitted activity criteria for soil disturbance volume as allowed under the Regulation 8(3) of the NES-CS (25 m<sup>3</sup> per 500 m<sup>2</sup> of soil disturbance and 5 m<sup>3</sup> per 500 m<sup>2</sup> of removal). Due to limited access under the carriageway (meaning adequate sampling cannot be undertaken until intrusive work begins), the controlled activity standards under the NES – CS cannot be met. Therefore, discretionary activity status should be sought for works in this area and any potential effects to human health managed through a CLMP.

Soil disturbance volumes for the piling works adjacent to 3 Reeves Road does not comply with the permitted activity criteria of Chapter E30 of the AUP(OP), as volumes will exceed 200m<sup>3</sup>. However, to comply with the controlled activity criteria under section E30.6.2.1, a detailed site investigation must be prepared and submitted to AC for consideration. As there is limited access under the carriageway (meaning adequate sampling cannot be undertaken until intrusive work begins), discretionary land use consent is required, with any environmental effects managed through a CLMP.

## 6 Existing Environment – Eastern Busway 3 Residential

### Chapter Summary

- *Based on the information reviewed, there were three sites identified within EB3 where HAIL activities were identified.*

### 6.1 Previous Environmental Investigations

To assess the features and values potentially impacted by the proposal a review of previous environmental investigations in EB3R has been undertaken. The following reports detailed below are included in full in **Appendix A**.

The AC contamination enquiry (**Section 6.3**) revealed that 11 Cortina Place was a former service station. Multiple environmental investigations have occurred at 11 Cortina Place, which are summarised in the William Roberts Road Extension Contaminated Land Technical Report included in **Appendix D**.

#### 6.1.1 Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), dated June 2000.

The 2000 Landfill Assessment Report reviewed the closed landfills throughout the Manukau City region to ensure the necessary resource consents were in place. The further information pertaining to the report background can be found above in **section 5.1**.

From the sites evaluated in the report, the following two sites were identified as a former landfill site within EB3R:

- Ti Rakau Park, and
- Riverhills Park.

The report detailed the following in relation to the sites:

- There was no record of any landfills having a specifically engineered clay cap, liner or base. Anecdotal evidence suggests that the landfills were established on top of existing ground, which was confirmed during the drilling of the groundwater bores
- All landfills were generally underlain to a variable depth and with variable quality of silt or clay type medium of unknown permeability
- None of the landfills within EB2 had a leachate collection system installed during infilling.

#### Ti Rakau Park

- The fill type at Ti Rakau Park was listed as cleanfill<sup>12</sup>
- Seven bores were advanced at Ti Rakau Park. During the bore installation soils materials consisted of silt and clay between 0.5 and 2.5m
- No abnormal landfill gas readings were recorded during the advancement of boreholes in Ti Rakau Park
- No refuse or organic matter was encountered during drilling in Ti Rakau Park.

#### Riverhills Park

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<sup>12</sup> Table 8, Assessment of Old Landfills for Manukau City Council, prepared by GHD Limited (GHD), dated June 2000.

- The site is located adjacent to a tributary of the Tāmaki River
- Three bores were advanced at Riverhills Park. The bore logs indicate that soil materials generally consist of sand, silt and clay to a depth of 1.5 m bgl
- Groundwater was discovered in one of the three bores at a depth of 2 m bgl
- No refuse or abnormal gas readings were encountered during drilling
- Table 7 of the report noted there was considerable herbicide spraying along the edge to the estuary, which may have posed an ecological risk
- Riverhills Park was given an LRF of 0.78, well below the MAV of 5. This indicates it wasn't a site of interest and did not require a resource consent.

#### **6.1.2 Phase 1 PSI for the Pakuranga Scheme Assessment of the Auckland Manukau Eastern Transport Initiative (AMETI) Alignment, prepared by GHD Limited (GHD), dated 7 December 2012.**

GHD presented the following key findings and conclusions relevant to EB3R:

- A site contamination enquiry was completed seeking records from AC which identified pollution incidents, no records of discharge consents, and no borehole installation records
- A walkover identified no sensitive receptors in close proximity to the EBA packages
- A discharge consent was identified at 11 Cortina Place, which was the result of the removal of a Underground Petroleum Storage System (UPSS) in May 2010. The report identified 11 Cortina Place as a former service station which had HAIL activities previously occurring on site.

#### **6.1.3 Previous Investigations at 11 Cortina Place**

As noted in the William Roberts Road Technical Report (attached in **Appendix D**) the site is a former service station. A 2010 UPSS decommissioning report indicated that following the removal of the fuel storage tanks on site, soil samples collected from within the site returned concentrations of hydrocarbons exceeding the Oil Industry Guidelines Tier 1 Acceptance criteria for industrial/commercial land use. Following remedial excavation in 2016, the soil validation report (2016) indicated the remedial objective was achieved within the site and that soil conditions meet the adopted industrial/commercial land use criteria.

The conceptual site model (2015) indicated hydrocarbon impacts were present along the Ti Rakau Drive frontage, associated with the former stormwater interceptor and ancillary connections. It was initially thought the stormwater interceptor would effectively act as 'cut-off' for migration of hydrocarbon down the natural groundwater hydraulic gradient. Following completion of the remedial works, the residual hydrocarbon impacts within the carriageway (Ti Rakau Drive) were recommended to be managed through a contaminated land management plan.

#### **6.1.4 Environmental Sampling (AECOM) - 2019**

In 2019 following recommendations of the 2012 PSI completed by GHD (section 5.1.2), AECOM undertook a Gap Analysis in support of the application for resource consents associated with soil disturbances for the proposed alignment. The Gap Analysis identified areas where further investigation was required. Between April and February 2019, six boreholes (advanced for geotechnical purposes) and thirty-three environmental hand augers were completed within the wider EBA works; of which twenty-six soil samples were collected from eighteen hand augers and two boreholes within EB3R at depths between 0.1 and 2.0 m bgl. Samples were analysed for the following contaminants:

- Heavy metals
- TPH

- BTEX
- PAHs
- Semi Volatile Organic Compounds (SVOCs; includes pesticides and herbicides)
- Volatile Organic Compounds (VOCs)
- Asbestos.

The environmental assessment focused on the collection of soil samples for laboratory analysis from materials within anticipated areas of soil disturbance and Riverhills Park. The analytical results from samples collected from locations within EB3R are presented in **Table A2** in **Appendix A**. The investigation locations relevant to EB3R are presented in **Figure 3** below.



Figure 3 - 2019 Environmental Investigation Locations within EB3R, and HAIL sites in or adjacent to EB3R

A summary of the analytical results are as follows:

#### **EB3R**

- All analytical results were below all environmental guideline criteria
- All TPH, PAH and SVOC concentrations were below the laboratory LOR
- No asbestos was detected in samples analysed
- Heavy Metal concentrations from all samples analysed were below the Auckland Background Concentrations.

#### **Riverhills Park**

- All analytical results were below all environmental guideline criteria
- All TPH, PAH and SVOC concentrations were below the laboratory LOR, with the exception of minor detections of hydrocarbons at HA9, but still well below the relevant criteria

- No asbestos was detected in samples analysed
- Heavy Metal concentrations from all samples analysed were below the Auckland Background Concentrations (non-volcanic).

## 6.2 Historical Aerials

Historical and current aerial photographs were obtained through the AC GeoMaps online portal, the Retrolens online portal and Google Maps. A review of aerial photographs was undertaken for the period 1939 through to the present day for EB3R. This allowed for the determination of land use changes and the identification of any pertinent items that have become apparent since the PSI in December 2012 but also to allow for the identification of any pertinent land uses that may have been omitted during the development of previous environmental investigations. The aerial photographs are included in **Appendix B**.

The review of aerial photographs highlighted the following key items:

- Much of the land is undeveloped farmland in the 1939 aerial photograph, with the exception of multiple residential dwellings and ancillary farm buildings
- Ti Rakau Drive is yet to be constructed in the 1939 aerial photograph
- Ti Rakau Park appears to have been developed into a sports field from either unused land or farm pastures sometime before the 1968 aerial photograph. Sports field outlines are visible in the 1972 aerial photograph
- Either side of Ti Rakau Drive has been developed with residential properties in the 1968 aerial photograph. Ti Rakau Bridge has not been constructed, with Ti Rakau Drive ending approximately 25 m west of the Tāmaki River
- Riverhills Park has not yet been developed, in its place there is an excavated area in the 1968 aerial photograph
- Housing has been further developed in the 1972 aerial photograph. Residential properties have been constructed south of Ti Rakau Drive at the eastern end
- The Ti Rakau Drive is yet to connect Pakuranga with Botany in the 1972 aerial photograph; however, the construction of the Ti Rakau Bridge appears to be underway, with what appears to be structural piles visible
- Riverhills Park appears to have been partially backfilled in the 1972 aerial photograph
- In the 1980 aerial photograph, Ti Rakau Bridge has been constructed, connecting Pakuranga with Botany. Riverhills Park has been backfilled, levelled and appears to have been converted into a sportsground
- In the 1996 aerial photograph, Freemantle Place has been constructed just south of Ti Rakau Drive, near Ti Rakau Bridge
- The site at 11 Cortina Place has been developed between 1980 and 1996, into what appears to be the former service station. The site at 11 Cortina Place is vacant in the 2015-2016 aerial photograph. Google Earth confirms the site was cleared in 2012. The site began redevelopment in 2017 and is now occupied by the 'Pakuranga Medical Centre' which comprises of a two-storey building and associated carpark

## 6.3 Auckland Council Contamination Enquiry

The following details the information received from the AC contamination enquiry pertaining to identified HAIL sites within EB3R:

- There are two closed landfill sites within EB3R located at Riverhills Park (168R Gossamer Drive, Pakuranga Heights) and Ti Rakau Park (27R William Roberts Road, Pakuranga)
- A consent for the discharge of contaminants at 11 Cortina Place for a former service station. The consent relates to closure of the site and discharge to land and water from remediation of contaminated land and is dated March 2016

A copy of the AC contamination enquiry report is included in Appendix C. The previous investigations of these sites that have been undertaken are described above.

## 6.4 EB3R Summary

Based on the information reviewed, there were three sites identified within EB2 where HAIL activities were identified. These sites are noted in Figure 3 summarised in Table 4 - Summary of findings within EB3R Table 4 and the potential for contamination to be encountered is detailed in the following sub sections. It should be noted sites identified within the William Roberts Road extension have not been detailed in the following subsections. For further details on those sites, refer to the William Roberts Road Extension Contaminated Land Technical Report in Appendix D.

Table 4 - Summary of findings within EB3R

Site Name/Location	Landuse Activity	HAIL Category	Comments
Riverhills Park	Closed landfill site	G3 – Landfill sites	Site investigated. No contamination encountered.
Ti Rakau Park	Closed landfill site	G3 – Landfill sites	No soil disturbance planned at or adjacent to this location.
11 Cortina Place / 64B Ti Rakau Drive*	Former service station, Pakuranga Medical Centre	F7 – Service stations including retail or commercial refuelling activities	The site has been addressed in the William Roberts Road Extension Contaminated and Technical Report, however residual hydrocarbon impacts potentially remain in the carriageway adjacent to the site (Ti Rakau Drive).

\*Note: Indicates sites detailed in the William Roberts Road Extension Technical Report

### 6.4.1 Riverhills Park

Based on the AC contamination enquiry for EB3R, Riverhills Park was identified as a closed landfill where HAIL activities may have occurred. The site is located adjacent to proposed works which run through the southern edge of the park. The 2000 Landfill Assessment Report detailed that the site had previously been filled with cleanfill. This was confirmed during drilling when no refuse or abnormal landfill gases were noted.

The 2000 Landfill Assessment Report noted considerable herbicide spraying along the eastern edge of the park. Further sampling by AECOM in 2018 and 2019 at Riverhills Park returned herbicide concentrations below the laboratory LOR for all samples collected. Minor detections of hydrocarbons were noted at HA9: however, results were below the Oil Industry Guidelines.

Based on the information reviewed in the 2000 Landfill Assessment Report and analytical results from samples collected from Riverhills Park in 2018, it is unlikely to be a significant source of contamination.

#### **6.4.2 Ti Rakau Park**

As detailed in the SSESCP, there will be no significant excavation activities occurring within Ti Rakau Park as part of the EB3R package, therefore the site will not be evaluated as part of this assessment.

For further information on Ti Rakau park refer to the William Roberts Technical Report included in full in **Appendix D**.

#### **6.4.3 11 Cortina Place**

This site was identified as a former service station in the 2012 PSI. Previous environmental investigations indicate that potential residual hydrocarbon impacts remain within the carriageway (Ti Rakau Drive) adjacent to the site. As part of works within the proposed alignment, approximately 1,400 m<sup>3</sup> of soil disturbance within an area of 3,400 m<sup>2</sup> is required in the carriageway adjacent to the former service station. Due to the potential for encountering residual hydrocarbon impacted soils within the carriageway (Ti Rakau Drive) and adopting a conservative approach, the NES – CS and AUP(OP) Chapter E30 will apply to the carriageway adjacent to 11 Cortina Place. The current estimated soil disturbance volume indicates the works in the carriageway (Ti Rakau Drive) adjacent to the site will not meet the permitted activity criteria of both the NES – CS (25 m<sup>3</sup> per 500 m<sup>2</sup> of soil disturbance and 5 m<sup>3</sup> per 500 m<sup>2</sup> of removal) and AUP(OP) Chapter E30 (200m<sup>3</sup>). As there is limited access under the carriageway (meaning adequate sampling cannot be undertaken until site establishment), the controlled activity criteria under both the NES – CS and the AUP(OP) cannot be met. Therefore, discretionary consent should be sought for works in this area, with any potential effects to human health and the environment encountered to be managed through a CLMP.



## 7 Assessment of Contaminated Land Effects

### Chapter Summary

Based on the findings within this assessment, the following two sites were identified within EB2 and EB3R with potential effects during construction:

- The land and carriageway adjacent to 3 Reeves Road
- The carriageway adjacent to 11 Cortina Place

The potential effects from the site includes:

- Exposure to contaminated soil and/or groundwater to construction workers (direct contact, ingestion or inhalation)
- Discharge of soil contaminants to land or air during construction

All remaining HAIL sites identified in **Sections 5 and 6** will not trigger consent requirements because:

- The site is not located within or adjacent to any area of significant excavation
- The site has been evaluated and contamination is unlikely to be present.

Based on the findings within **Sections 5 and 6** of this assessment, the potential effects of construction within EB2 and EB3R are presented in Table 4 below.

Table 4 - Assessment of Effects within EB2 and EB3R.

Site Name	Landuse Activity	Potential Effects
Land and carriageway adjacent to 3 Reeves Road	Service Station	- Exposure to contaminated soil and/or groundwater to construction workers (direct contact, ingestion or inhalation) - Discharge of soil contaminant to land or air during construction
The carriageway adjacent to 11 Cortina Place	Service Station	- Exposure to contaminated soil and/or groundwater to construction workers (direct contact, ingestion or inhalation) - Discharge of soil contaminant to land or air during construction.

All remaining HAIL sites identified in **Sections 5 and 6** will not trigger the need for consent due to the following:

- The site is not located within or adjacent to any area of significant excavation
- The site has been evaluated and contamination is unlikely to be present.

## 8 Mitigation

### Chapter Summary

- *A CLMP will be provided as part of this assessment in order to manage potential contamination within EB2 and EB3R and provide guidance for the impact to works, health of the public and surrounding environment.*
- *Hazardous building materials have been encountered during investigations within EB2 and may be present during works within EB2 and EB3. If further unexpected discoveries are encountered the CLMP should be consulted for guidance during works.*

### 8.1 Residential Properties

As part of the proposed works within EB2 and EB3R, numerous residential buildings are planned for deconstruction/demolition. Owing to the ages of the housing stock in the vicinity of EB2 and EB3R, it is possible that some buildings may contain hazardous building material like asbestos or lead based paint. Such contaminants have the potential to generate localised effects when soil disturbance occurs. As highlighted in **Section 5.1.5**, asbestos was discovered within Seven Oaks Drive during geotechnical works. During removal of structures within the proposed alignment, the CLMP should be consulted for guidance.

### 8.2 Unexpected Discoveries

It is more likely than not that during the course of the works, unexpected discoveries of impact in soils will be encountered. This could include hazardous building materials from demolition work/fly tipping, visual observations of staining or the presence of odours etc. The effects from unexpected discoveries can be appropriately mitigated via the measures detailed in the CLMP.

### 8.3 Contaminated Land Management Plan (CLMP)

Based on the information reviewed as part of this technical report, there is the potential for contaminated soils and groundwater or hazardous building materials to be encountered during the construction of EB2 and EB3R, which may have the potential to impact the health of workers, the health of the public and surrounding environment. However, it is considered that any effects can be appropriately managed via the CLMP used in conjunction with the Construction Environmental Management Plan (CEMP) and the ESCEA.

The CLMP has been prepared by a SQEP and will require updating as the Project progresses, as further information becomes available and includes:

- Summary of information and overview of the proposed alignment construction methodology
- Summary of any soil sampling works undertaken
- Roles and responsibilities and contact details for the parties involved in the land disturbance activities, including the SQEP
- Identify potential and known hazards arising from contamination (if present)
- Identify specific management procedures developed for construction earthworks including:
  - On Site soil management practices
  - Off Site soil transport and disposal
  - Erosion and sediment control
  - Management of dust and odour

- Contingency measures in the event of accidental/unexpected discovery (asbestos, unknown fill, odours, staining etc.)
- Post development controls (if required).

The contractor will need to manage its health and safety obligations with respect to risks relating to contaminated land. Measures to protect the health of workers, the public and the surrounding environment will need to be incorporated into any health and safety plan that relates to work on sites where potential or known hazards have been identified in the AEE.

## 9 Recommendations and Conclusions

### Hazardous Building Materials

As highlighted above in Section 8.1 and 8.2, hazardous materials such as asbestos and leaded paints may be encountered during structure removal and soil excavation activities. Unexpected discoveries of hazardous materials during site works will be managed through a CLMP and a SQEP should be consulted.

### EB2

As part of previous investigations, 3 Reeves Road has been identified as a service station with current HAIL activities occurring on site and no environmental investigations detailing the state of groundwater and soil at present exist for the site. As a conservative assumption it is reasonably likely for contamination to exist on 3 Reeves Road and migrating via groundwater to adjacent land. Therefore, consent will be required for the carriageway adjacent to 3 Reeves Road. The ESCEA indicated that approximately 250 m<sup>3</sup> of soil disturbance is required in land directly adjacent to the site for piling activities associated with the Reeves Road Flyover. Soil disturbance will likely exceed the permitted activity standards for the NES – CS and AUP(OP) Chapter E30, therefore discretionary consent is being sought for excavation activities occurring at this site. Any potential effects should be managed by the CLMP.

All remaining sites within EB2 identified as part of this assessment comply with AUP(OP) permitted activity rules outlined in Section E30 and the NES-CS.

### EB3R

Based on the information review as part of this assessment, Riverhills Park is unlikely to be a significant source of contamination, and therefore the NES – CS and AUP(OP) Chapter E30 do not apply. The SSESOP identified that no soil disturbance is required within Ti Rakau Park as part of the proposed alignment, therefore consideration for this site as part of this assessment is not required.

Residual hydrocarbons are reasonably likely to be found within the carriageway adjacent to the former service station at 11 Cortina Place. As soil disturbance volumes are unlikely to meet permitted activity criteria for both the NES – CS and the AUP(OP) Chapter E30, consent is sought for a discretionary activity for works. Any potential effects should be managed by the CLMP.