REPORT

Tonkin+Taylor

Detailed Site Investigation

110 Jack Lachlan Drive and 620 Whitford-Maraetai Road

Prepared for
Beachlands South Limited c/- Russell Property Group

Prepared by
Tonkin & Taylor Ltd

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1 Introduction

Tonkin & Taylor Ltd (T+T) has been commissioned by Beachlands South Limited Partnership (Beachlands South LP) c/- Russell Property Group (Russell Property) to undertake a ground contamination detailed site investigation (DSI) for the development area across three land parcels (hereafter referred to as "the site"), being Formosa Golf Resort at 110 Jack Lachlan Drive and the neighbouring properties at 620 and 712 Whitford-Maraetai Road (refer **Figure 1.1**).

This report has been prepared in general accordance with the requirements for a Preliminary Site Investigation (PSI) and DSI referred to in the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)[1], and as outlined in the Ministry for the Environment (MfE) Contaminated Land Management Guideline No. 1[2].

The persons undertaking, managing, reviewing, and certifying this investigation are suitably qualified and experienced practitioners (SQEP), as required by the NESCS and defined in the NESCS Soil Users' Guide (April 2012).

Figure 1.1: Site Location plan (Image sourced from Auckland Council (AC) Geomaps)

1.1 Background

T+T understand that Beachlands South LP wish to apply for a private plan change to rezone the land for urban development purposes. A copy of the draft structure plan is presented in **Appendix A**. The plans indicate that the proposed plan change will divide the plan change area into a series of sub-precincts (such as Village Centre, Marina Point, Community, Coastal, Golf, Whitford-Maraetai Rd

[1] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
[2] Ministry for the Environment, updated 2021, Contaminated land management guidelines No. 1: Reporting on Contaminated Sites in New Zealand.

properties, 620). The structure plans show the site will include amenities such as coastal walkways, ecological areas, school, and village shops.

This ground contamination assessment has been prepared to support the plan change application and guide potential future resource consents required for subdivision, change in use and soil disturbance under the NESCS and contaminated land rules in the Auckland Unitary Plan (AUP).

Two assessments[3+4] have previously been carried out (one per mentioned property – a desktop assessment of Formosa Golf Resort at 110 Jack Lachlan Drive and an assessment, including targeted soil sampling, at the neighbouring property at 620 Whitford-Maraetai Road). The investigation and desktop assessment of Formosa Golf Resort at 110 Jack Lachlan Drive is presented in **Appendix A** and a summary of both mentioned assessments is provided in **Section 3**. The previous investigations identified potential contamination sources at the site (refer **Table 5.1**) which required further investigation to support the plan change application.

1.2 Objective and scope of work

T+T has undertaken this investigation to assess whether the NESCS and contaminated land rules in the Auckland Unitary Plan (AUP) apply to the site in support of the proposed plan change, and to provide an assessment of contaminated related soil handling and disposal implications for the proposed redevelopment.

The purpose of this investigation is to determine if any potentially contaminating activities have occurred (potentially impacting soil quality) and therefore if the proposed land use changes will be subject to National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NESCS) or if contaminated soil provisions in Auckland Unitary Plan (Operative in Part) are applicable. If either are applicable, further (intrusive) investigation may be needed before development and the proposed change in land use.

The scope of work for this assessment comprised:

<u>110 Jack Lachlan Drive and 620 Whitford-Maraetai Road</u>

- Review of the existing desktop assessment reports, and preparation of an internal sampling strategy based on these reports.
- A site walkover for the collection of surface samples and advancement of hand auger boreholes. Samples will be visually assessed and logged by a suitably qualified T+T geotechnical and/or environmental staff.
- Laboratory analysis of select soil samples for heavy metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), and semi-quantitative asbestos.
- Collection of duplicate samples for quality assurance and quality control (QA/QC) purposes.
- Assessment of the results with respect to the relevant regulatory criteria and typical soil disposal criteria for Auckland.

[3] T+T 2020. Preliminary Site Investigation Report for Land Remediation – 110 Jack Lachlan Drive, Beachlands, 1013482.0000.v2.

[4] Fraser Thomas Consultants, December 2012, Proposed Ahuareka rural subdivision at 650 Whitford-Maraetai Road Environmental assessment, #31883

712 Whitford-Maraetai Road

- Complete a desk study to review the site history to ascertain the potential for on-site activities to have resulted in ground contamination. These activities are defined by the MfE's Hazardous Activities and Industries list (HAIL). The desk study comprised:
  - Review Council property files and planning maps
  - Review of "Site Contamination Enquiry" and Council records of pollution incidents.
  - Review of selected historical aerial photographs from Retrolens and Auckland Council's GIS Viewer.
  - A site walkover inspection.

This report documents our findings and comments on the potential for ground contamination at the site, in the context of future residential land use, including potential resource consents and disposal and earthworks implications with regard to ground contamination.

2 Site description and identification

The site is located to the west of Whitford-Maraetai Road, Beachlands adjoining the Waikopua Estuary in the Botany-Clevedon Ward of Manukau City. The site comprises a golf course and function centre in the north, and farmlands and residential dwellings in the south. The properties assessed within this report are identified in **Table 2.1** and **Figure 2.1**.

Table 2.1: Site identification

Street address	110 Jack Lachlan Drive, 620 and 712 Whitford-Maraetai Road
Legal description	• Lot 2 DP 501271 • Lot 100 DP 504488 • Lot 4 DP 54105
Site area	A total area of 250.5075 hectares (ha) comprising: • 170.4740 ha (110 Jack Lachlan Drive) • 79.9444 ha (620 Whitford-Maraetai Road) • 4.7518 ha (712 Whitford-Maraetai Road)
Current zoning	Coastal – General Coastal Marine Zone Rural – Countryside Living Zone

The properties under investigation relative to the plan change/structure plan area is shown in **Figure 2.1.** Properties within the plan change area that have not been assessed as part of this investigation are outside of Beachlands South LP control. Additionally, live zoning is not being sought for the properties outside of the areas displayed below as part of this plan change. Further assessment for those properties will be required in advance of the future plan change to rezone those areas to a live zoning.

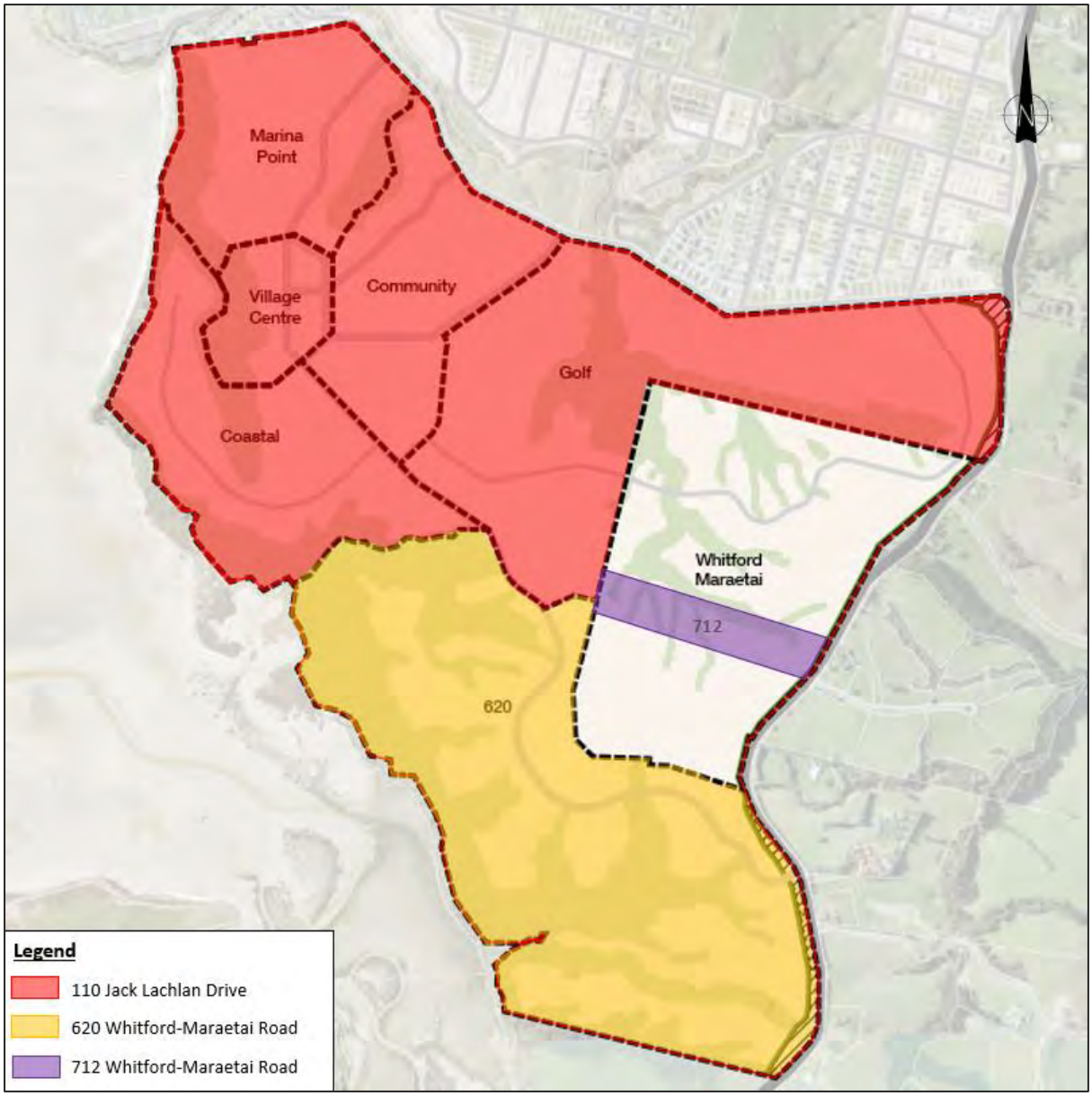

Figure 2.1: Sites under investigation relative to the plan change/structure plan area.

2.1 Site condition

On 6 and 9 July 2021 T+T staff completed a site walkover of external areas of Formosa Golf Resort on 110 Jack Lachlan Drive and 620 Whitford-Maraetai Road for the purpose of soil sampling. The following site features were observed during the site walkover:

- The topography of the site is undulating, elevated at approximately 70 meters above mean sea level (m asl) in the eastern portion of the site along Whitford-Maraetai Road, gradually sloping to 10 m asl in the west. The undulating landscape is mostly natural except for some areas which were constructed using cut to fill.
- The majority of the site is vacant grazing land and golf playing fields. Access tracks and internal pathways consist of gravel and asphalt hardfill in moderately good condition, visible cracks and potholes were present.
- T+T conducted a walkover of the gully area at 620 Whitford-Maraetai Road. There was no evidence of buried rubble or rubbish as identified in previous investigations. Hand augers

advanced in the gulley identified potential fill material however this was thought to be associated with the construction of the equestrian arena.

- There was no evidence of the historical inground sheep dip or former spray race identified during the site visit.
- A stockpile of tyres was observed along the western boundary of 620 Whitford-Maraetai Road; however their use was unknown. We understand that the area where the tyre stockpile is located on is classed as a Significant Ecological Area (SEA) and that whilst no development is proposed in this area, minimal earthworks to remove the tyres may be required.
- The main Formosa function centre, bungalows and carparking is located in the centre of site. A wastewater treatment system comprised of a series of inground concrete settling tanks, control room and above ground tanks was visible to the west of the function centre.
- The large rectangular building along the northern boundary of the site was utilised for the storage of cleaning chemicals and agrichemicals. T+T personnel did not enter the building; however fertiliser bags and plastic jerry cans were identified in an open garage in the north-western corner of the building. Minor oil staining from vehicles parking on the gravel hardstand to the west of the building was also identified, a sample was collected from this area.
- No other staining, odours or evidence of contamination was observed on-site by field staff, and no visible ACM fragments were observed in soil within the soil sampling area.

On 10 December 2021 T+T staff undertook a site walkover of external areas of 712 Whitford-Maraetai Road. The following site features were observed during the site walkover:

- The property is currently leased to The Turning Point New Zealand wellness centre in the east and grazing land in the west. Access tracks and internal pathways consist of a concrete driveway in good condition and grassed paddocks.
- Storage of small quantities (e.g. 20 L containers) of herbicides, fungicides, pest poison and a jerry can of fuel was noted in the storage shed to the east of the carport. The chemicals were stored in sealed containers either on the concrete hardstand or on shelving. There were no signs of staining or spills evident surrounding the chemical storage.
- Fruit trees, a large vegetable garden, firewood storage and wooden compost bins were identified in the eastern paddock adjacent to Whitford-Maraetai Road.
- A historic stock yard and loading race was identified to the south of the vegetable garden. There was no evidence of a former spray race within the stock yard.
- A tennis court, pavilion, ornamental garden and fruit trees were identified to the west of the residential dwelling. There was no evidence of ACM in externally viewed building materials. The observed structures consisted of timber weatherboard, brick, copper and tin.
- The grazing land in the western portion of the property was overgrown. A stream and pond runs through the centre of the property surrounded by bush and native trees. Several beehives were located along the southern boundary in addition to a small stockpile of inorganic waste which was associated with felling of a tree and bush clearance.
- There was no visual evidence of burning, staining, or contamination observed on-site by field staff.

Relevant observations made at the time of the walkovers are summarised below and selected photographs are included in **Appendix B**.

2.2 Surrounding land use

The land uses in the area surrounding the site include:

- North – Jack Lachlan Drive, Beachlands residential suburbs.
- South – Farmland, mangroves of the Waikopua Estuary, and Whitford-Maraetai Road.
- East – Farmland and Whitford-Maraetai Road.
- West – Jack Lachlan Drive Esplanade Reserve, Waikopua Estuary and Tamaki Strait.

2.3 Site setting

2.3.1 Published geology

The published geological map of Auckland[5] indicates that the site is underlain by alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grit beds of the Waitemata Group, East Coast Bays Formation (red shading).

A portion of the site along the western boundary bordering the Waikopua Estuary consists of pumice sands, silts and gravels of the Tauranga Group (green shading).

The location of the site in context of the regional geology is presented in **Figure 1.1**.

Figure 2.2: Published geology of the area (source Kermode, 1992)

[5] Kermode, L.O. 1992: Geology of Auckland urban area. Scale 1:50,000. Institute of Geological & Nuclear Sciences geological map 2. 1 sheet + 63 p. Institute of Geological Nuclear Sciences Ltd., Lower Hutt, New Zealand.

2.3.2 Site geological information

The subsurface profile observed during intrusive investigation works consisted of topsoil followed by natural ground conditions which generally align with the published geological information. However, cut to fill earthworks were undertaken during construction of the Formosa Golf Course. The depth of fill is unknown and there is potential that the fill was non-engineered. Some marine sediments have also been disposed of near the coastal edge of 620 Whitford-Maraetai Rd.

2.3.3 Hydrogeology and hydrology

No published groundwater data was available for the site. Based on topography and proximity to Tamaki Strait, groundwater is expected to be encountered between 1.5 and 5.0 m below ground level (bgl) depending on the ground level elevation. Groundwater in the northern portion of the site is expected to follow topography and flow in a north-westerly direction, whereas groundwater in the southern portion of the site flows in a south-westerly direction

AC's online GeoMaps indicates that surface water flows to the west via overland flow paths that are connected to permanent streams which run through the site, some of which are intermittent and ultimately flow to the Waikopua Creek to the west of the site. Surface water at 110 Jack Lachlan Drive also discharges into wetlands (constructed, natural, and coastal) and associated ponds.

3 Previous investigations

As part of the ground contamination assessment, T+T reviewed the previous desktop assessment reports undertaken by T+T (T+T 2020) and Fraser Thomas (2012). Results from these investigations are discussed below. T+T utilised information from these reports to supplement the rationale for this investigation.

The 2012 assessment of 620 Whitford-Maraetai Road identified two potential contamination sources. Testing at these locations show low levels of contaminants. Suspected asbestos fragments were identified within fill material on the site, however no asbestos analysis of this material was carried out.

The following sections provide a summary of the key findings of these investigations with respect to the potential ground contamination related risk.

3.1.1 Preliminary Site Investigation Report for Land Remediation – 110 Jack Lachlan Drive, Beachlands[3]

A desk study assessment was undertaken by T+T in 2020 to determine whether existing and historical activities listed on the MfE's HAIL have been undertaken on site, and to ascertain the potential for soil contamination which may require land remediation, in relation to the proposed change of land use at the Formosa Golf Resort. The following provide a summary of the desk study works undertaken:

- The site was used as a golf resort from approximately 1996. Prior to this it was used as pastoral land with a residential dwelling and associated farm sheds.
- Cut to fill earthworks were undertaken as part of the construction of the golf course to either create level playing fields or constructed gullies. These areas of cut to fill were identified as borrow disposal areas.
- Council records indicated the site has potentially been subject to HAIL Category A10 – persistent pesticide bulk storage use due to the use of the site as a golf course.
- Council advised that their records also indicated "*incidents of raw sewage dumping in relation to the on-site wastewater treatment and effluent disposal*". We understand from the client that this has been rectified.
- Resource consents for the discharge of contaminants to air, and onto land or water were included in the contamination enquiry provided by AC. The consents were related to neighbouring properties that are outside of the plan change area, and were considered unlikely to have resulted in soil contamination at the site due to their location, distance and nature of contaminants.
- The desk study identified four activities as having the potential to have impacted site soils:
  - Filling during site development, depending on the source of the fill material.
  - Use of pesticides, herbicides and fungicides on the golf course.
  - Buildings built/demolished during the period when asbestos containing materials (ACM) and lead based paints were used.
  - Sewage from the on-site wastewater treatment plant.
- The impacts of the activities listed above were expected to be confined to historically filled areas, near surface soils around the existing/former buildings and the fairways, and within the

footprint of the wastewater treatment plant and constructed wetland (open water/pond, and vegetated – mixed native and exotic)[6].

3.1.2 Environmental Site Assessment (ESA) – 650-680 Whitford-Maraetai Road[4]

An ESA was undertaken by Fraser Thomas in 2012 as part of a resource consent application for the proposed Ahuareka Rural Subdivision. The following provides a summary of the ESA works:

- The site was used for mixed sheep and beef farming activities since the early 1900s. Site interviews conducted with landowners confirmed that no horticultural activities had been undertaken on the site.
- Fuel for farm equipment was stored in 44-gallon drums in a permanent location. No visual or olfactory evidence of hydrocarbon contamination was observed during the site visit.
- Two sheep dips were located on-site. The former owners identified that the older immersion sheep dip was located on flat land in the south-western corner of the site, however the sheep dip was unable to be located during the site walkover. Evidence of old fence posts were visible in the estuary; therefore it was assumed that the sheep dip was reclaimed by the tide. From the 1960s sheep dipping was undertaken via a spray race which was located on flat land midway between the old woolshed and the gulley. No visual evidence of stock yards, a spray race or in-ground structures were observed during the site visit.
- In 2003 marine sediment fill was placed to the north-west of the main residence, and along the coastal land of the western boundary. The source of the fill material was excess dredging material associated with the Pine Harbour development.

Intrusive soil sampling was conducted on 16 May 2011 at two areas based on the desktop findings detailed above. Sample results were compared to NESCS for residential 10% produce, AUP permitted activity criteria, and the published volcanic background concentrations for Auckland. The sampling rationale is outlined below:

- Six (6) samples were collected from the gulley and areas of fill at surface (0-0.2 m), 0.5 m and 1.0 m.
- Eight (8) surface samples (0-0.2 m) were collected from the former spray race area.
- Analysis of soil samples for metals, OCPs, and semi volatile organic compounds (SVOCs).

[6] T+T, April 2021, Beachlands Plan Change: Interim deliverable – on-site wetland delineation, 1014358.4000.

Table 3.1: Fraser Thomas Screening Results

		Metals							Pesticides
		Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Dieldrin
NES Residential (10 % produce)[1]		20	3	460	>10000	210	400[5]	7400[5]	2.6
AUP Permitted Activity Criteria[2]		100	7.5	400	325	250	105	400	2.7~
Background Levels (volcanic)[3]		12	0.65	55	45	65	35	180	<LoR
Typical Managed Fill Criteria*		70	7.5	400	325	250	320	400	0.2
Sample ID	**Laboratory Sample ID**								
SR1	897258.1	6	<0.10	10	12	9.2	3	35	<0.010
SR2	897258.2	7	0.15	17	19	13.9	26	86	<0.010
SR3	897258.3	7	<0.10	12	12	12	4	52	**0.031**
SR4	897258.4	7	0.14	13	12	13	6	55	**0.027**
SR5	897258.5	11	0.21	15	19	18	4	101	**0.017**
SR6	897258.6	7	0.32	13	23	14.1	6	127	**0.017**
G1a	897258.7	**43**	**0.68**	45	56	37	6	**480**	-
G1b	897258.8	**18**	0.13	24	21	11.5	4	113	-
G2a	897258.9	**47**	**0.79**	**85**	**103**	39	9	**1030**	-
G2b	897258.1	10	<0.10	21	**124**	31	4	62	-
G3a	897258.11	**49**	0.48	**67**	**48**	33	8	**250**	-
G3b	897258.12	**40**	0.35	44	45	25	6	**620**	-

Notes: All values in mg/kg unless otherwise indicated (i.e. asbestos). '-' indicates not analysed or no relevant acceptance criteria. <LOR = less than laboratory limit of reporting. Grey font indicates values <LOR. Red values indicate that the results exceed NES recreational criteria. Underlined values indicates that results exceed the AUP Permitted Activity Criteria. **Bold values** indicate that results exceed the published background concentrations for volcanic soils in Auckland * values indicate that results exceed typical managed fill criteria

- Surface samples undertaken in the vicinity of the former spray race identified the following exceedances:
  - Low levels of dieldrin in exceedance of the published background concentrations for volcanic soils in Auckland at SR3 through SR6.
- Test pit excavations at the base of gullies on the eastern part of the site identified fill material containing tyres, steel pipe, concrete, corrugated iron and pieces of suspected ACM. Analysis of samples from this area identified the following exceedances:
  - Concentrations of arsenic in exceedance of the NESCS for residential 10% produce at G1a, G2a, G3a and G3b.
  - Concentrations of zinc in exceeded of the AUP permitted activity criteria G1a, G2a and G3b.
  - Concentrations of arsenic, cadmium, chromium, copper zinc exceeded the published background concentrations for volcanic soils in Auckland.

Fraser Thomas considered that the desktop study and limited sampling investigation did not identify significant contamination issues that may impact the proposed development. However, T+T note that during the site walkover undertaken by Fraser Thomas, field personnel identified suspected ACM within fill material in a gulley. Laboratory analysis of asbestos was not included in the Fraser Thomas sampling regiment.

4 Site history – 712 Whitford-Maraetai Road

4.1 Summary

A review of the sources of historical information obtained for the site and surrounding area is set out in the following subsections.

In summary, the information reviewed shows that the site was likely originally used for grazing purposes from at least circa 1955. Site levelling activities were undertaken in the eastern portion of the property associated with the re-setting of a residential dwelling, new garage and driveway. The western portion of the property was utilised for grazing. The site use was changed from a private residence to a detoxification and rehabilitation facility run by The Turning Point New Zealand Limited in September 2021.

A small-scale vegetable garden was visible to the east of the residence by 2001 which was relocated to the eastern paddock in 2008 and replaced with a tennis court. Storage of small quantities (e.g. 20 L containers) of herbicides and fungicides glyphosate, chlorocarb, sprinter 700 DS, relay, and conquest were noted in the shed to the east of the carport. The chemicals were stored in sealed containers either on the concrete hardstand or on shelving. Containers of Zapp Encore, combination sheep drench, pest poison and a jerry can of fuel was also noted. There were no signs of staining or spills evident surrounding the chemical storage.

Review of the Auckland Council property files indicate that the roof material of the residential dwelling consisted of fibrolite (asbestos cement) shingles.

4.2 Historical aerial photographs

Historical aerial photographs were sourced from Retrolens and Auckland Council GeoMaps GIS viewer which are attached in **Appendix C**. Relevant features of the site and surrounding land from each aerial photograph are described in **Table 4.1** below.

Table 4.1: Summary of aerial photograph review

Date (Source)	Key site features	Surrounding land features
1955 (Retrolens)	The site consists of vacant farmland with a gully feature traversing from the north-western boundary terminating in the eastern corner of the site.	The surrounding land use consists of vacant farmland, residential dwellings and multiple streams. Whitford-Maraetai Road is established to the east of the site.
1961 (Retrolens)	There were no significant changes evident.	There were no significant changes evident.
1968 (Retrolens)	There were no significant changes evident.	Earthwork activities associated with the establishment of residential dwellings, and partially infilling the gully is visible to the north.
1975 (Retrolens)	There were no significant changes evident.	No significant changes other than continual residential development of the properties to the north and south of the site.
1987 (Retrolens)	Earthwork activities associated with the levelling the site for the purpose of a residential dwelling.	No significant changes other than the establishment of horticultural land use to the north of the site.
1996 (Retrolens)	A residential dwelling and pond are visible in the eastern portion of the site.	Horticultural land use activities on the property to the north of the site has ceased. Significant

		earthworks is visible on the land to the north of the site, and a tree plantation to the south-east.
2001 (Retrolens)	A vegetable garden has been established to the west of the residential dwelling. Two unknown rectangular structures are visible in the centre and western portion of the site. A wooden structure is visible along the southern boundary in the eastern portion of the site.	Small stockpiles of soil is visible on the property directly north of the site, and on the property to the south-east. A golf course, function centre and accommodation has been established on the land to the north and north-west. Horticultural land use is visible to the south-east.
2008 (Retrolens)	The vegetable garden has been replaced with a tennis court and moved to the eastern portion of the site adjacent to the stock race.	No significant changes other than earthworks activities to the south-east.
2017 Retrolens)	There were no significant changes evident other than fruit trees were planted in the eastern paddock adjacent to Whitford-Maraetai Road.	No significant changes other than a concrete accessway and branching roads to the south-east.

4.3 Council property files

The property file for 712 Whitford-Maraetai Road was received from Auckland Council on 10 December 2021. The documents in the file most relevant to prior land use are summarised in **Table 4.2** below, selected documents are included in **Appendix D**.

Table 4.2: AC property file review

Date	Summary
October 1976	Application for a building permit notes that the roof shingles are to be fibrolite shingles.
October 1976	Drainage plans indicate the proposed re-siting of the residence, suggested driveway and proposed new garage for Mr and Mrs Macindoe. The original location of the house is unknown.
May 1988	Application by Arthur Morgenstern to install a groundwater bore on the property. The site plans for the proposed bore also identifies the location of the septic tank.
May 1988	Drilling lots prepared by Drillwell Exploration NZ Limited indicated that the site geology consisted of clay to 0.3 m underlain by Waitemata sand to 130 m followed by Greywacke to 171 m.
April 2004	Application for building consent and plans prepared for Bruce Gillespie for a proposed barn replacing the existing car port and new septic tank system. The site plans indicate stock yards in the eastern portion of the site, and existing house and garage.
November 2020	Maintenance record identifies that the on-site wastewater systems is in good condition and routinely checked 6 monthly.
September 2021	Resource consent application by The Turning Point New Zealand Limited to change the use of the existing building from residential to a detoxification and rehabilitation facility.

4.4 Council contamination enquiry

A site contamination enquiry (SCE) was placed with Auckland Council on 7 December 2021. The response provided is attached in **Appendix E** and summarised below:

- There was no contamination information held within Council records, however due to the age of the dwelling on site there is potential for asbestos or lead paint within building materials.
- An expired consent to construct a 100 mm diameter bore to a depth of approximately 180 m and installation of steel casing to a depth of approximately 91.2 m, for the extraction of groundwater for stock and domestic supply.
- Three expired consents for bore construction are located within approximately 200 m of the site.

5 Potential for contamination

The assessments outlined in **Section 3** identified that potential HAIL activities may have been undertaken at the site. The activities, and our interpretation of their potential contaminants of concern and an assessment of the likelihood, potential magnitude and possible extent of contamination for them are presented in **Table 5.1**. The sampling locations undertaken (see **Section 6**) are presented on **Figure 5.1** and **Figure 5.2** below.

Table 5.1: Potential HAIL Activities

Land use/activity	Potential contaminants	Likelihood, magnitude and possible extent of contamination	HAIL reference	Associated investigation location (refer to Section 0)
110 Jack Lachlan Drive, Beachlands				
Filling during site development	Heavy metals, heavy end hydrocarbons and asbestos.	Historical filling in 1995 when the site was first developed into a golf resort.	HAIL Activity I – Intentional or accidental release of contaminants in fill pose a risk to human health and the environment.	HA07, HA10, HA11, HA12, HA13, HA14, HA15, HA16, HA17 and HA22
Golf course – potential for application of and storage of persistent pesticides	Arsenic, cadmium, lead, mercury, copper; wide range of pesticides and herbicides.	The site was utilised as a golf resort from approximately 1995 to present day. Low concentrations possible in shallow soil (typically to 400 mm depth).	HAIL Activity A10 – Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds.	SS01 through SS10
Buildings built/demolished during time ACM and lead based paints were used	Asbestos as fibres, fines or fragments, lead.	Construction and demolition of buildings on-site between 1955 and approximately 1996. The extent of contamination would likely be localised and shallow soils in 'halos' immediately around the buildings, unless mobilised by soil disturbance or water runoff.	HAIL Activity I – Intentional or accidental release of contaminants, if contaminants are present at concentrations that pose a risk to human health or the environment.	HA07, HA08, HA18, SS05
Sewage – on-site wastewater treatment plant and effluent	Domestic waste – biological hazards (bacteria, viruses) Nitrogen species (nitrate, nitrite, ammonia).	Council records indicate raw sewage dumping in relation to the on-site wastewater treatment and effluent disposal at the site. The constructed wetland areas shown on the site plans indicates	HAIL Activity G6 – Waste recycling or waste or wastewater treatment. If contaminants are present at	No samples collected to date

Land use/activity	Potential contaminants	Likelihood, magnitude and possible extent of contamination	HAIL reference	Associated investigation location (refer to Section 0)
disposal to constructed wetland areas		the area affected. We understand from the client that this issue has been rectified. Low potential for leached contaminants into underlying soil. Contamination leached is usually restricted to near surface soils.	concentrations that pose a risk to human health or the environment.	
620 Whitford-Maraetai Road				
Filling of gullies	Variable depending on the source of the fill, however commonly heavy metals, heavy end hydrocarbons and asbestos.	Test pit excavation undertaking in 2012 identified fill material at the base of gullies on the eastern part of the site.	HAIL Activity I – Intentional or accidental release of contaminants in fill pose a risk to human health and the environment.	HA01 and HA04
Mixed sheep and beef farming - potential for livestock drip or spray race operations	Arsenic, organochlorines (e.g. aldrin, dieldrin, DDT, lindane) and organophosphates, carbamates, and synthetic pyrethroids.	Site interviews confirmed the presence of a historical in-ground sheep dip and above ground spray race. Contamination is likely limited to surface soils and localised.	HAIL Activity A8 – Livestock dip or spray race operations.	Sampled as part of the 2012 investigation.
Storage of fuel for farm equipment	Hydrocarbons including BTEX, PAHs, and solvents; lead and other metals, particularly if waste oil handled.	Fuel stored in 44-gallon drums and mobile tanker trailers. Low potential for localised contamination of near surface soils beneath the drum storage area.	HAIL Activity A17 – Storage tanks or drums for fuel, chemicals or liquid waste.	
712 Whitford-Maraetai Road				
Buildings built/demolished during time ACM and lead based paints were used	Lead, asbestos as fibres, fines, or fragments.	Building plans held on the Auckland Council property files indicated that current buildings on-site were built prior to 1988. Furthermore the property file indicated that the roof was constructed with fibrolite (asbestos cement) shingles. Given the age of the buildings, it is likely that the building materials contained ACMs and/or lead based paints. The extent of contamination would likely be localised and shallow soils in 'halos'	Potentially a HAIL, Activity I – Intentional or accidental release of contaminants, if contaminants are present at concentrations that pose a risk to human health or the environment.	No soil samples collected to date

Land use/activity	Potential contaminants	Likelihood, magnitude and possible extent of contamination	HAIL reference	Associated investigation location (refer to Section 0)
		immediately around the buildings, unless mobilised by soil disturbance or water runoff.		
Potential partial infilling of gully and levelling for residential dwelling.	Variable depending on the source of the fill. Typical contaminants include heavy metals, polycyclic aromatic hydrocarbons (PAHs) and asbestos.	Aerial photograph identified potential historical filling in the 1987 aerial when the residential dwelling was placed on-site. The magnitude of contamination is unknown and dependent on the source of the fill.	HAIL Activity I – Intentional or accidental release of contaminants in fill pose a risk to human health and the environment.	No samples collected to date

T:\Auckland\Projects\1014358\1014358.5000\WorkingMaterial\GIS\Maps_Documents\210720.RUKO.Sampling locations map\210720.RUKO.1014358.5000.aprx Layout: Formosa golf course- with sub boundaries 2021-Dec-21 4:38 pm Drawn by MOLI

LEGEND

- Surface Sample, Investigation
- Hand Auger, Investigation
- Formosa Property Boundary
- Site 620 Property Boundary
- Sewer Line
- Live Zoning Boundary

Inferred potential contamination sources

- Engineered fill (No HH + Env exceedences)
- Potential hazardous storage area (HAIL activity I)
- Borrow disposal area (No HH + Env exceedences)
- Additional shed present ~ 1972 - 1996 (No HH + Env exceedences)
- Residential dwelling present 1955 - 1996 (No HH + Env exceedences)
- Several smaller buildings/sheds present ~ 1995 - 1996 (No HH + Env exceedences)
- Shed structure present ~ 1961 - 1996 (No HH + Env exceedences)
- Sewage plant (Potential HAIL G6)

Constructed Wetland

- Constructed freshwater vegetated wetland: mixed native and exotic
- Constructed freshwater vegetated wetland: exotic
- Constructed freshwater wetland: open water (pond)
- Sub-precinct Boundaries

HA103b HA103a HA103 HA06 HA103c SS09 Marina Point SS08 SS07

HA25 HA22 Golf HA24 HA23

HA103b HA103c HA103 HA103a HA13 SS10 HA12 HA26 Marina Point HA11 HA10 Community HA18 HA09 HA14 Village Centre HA07 HA16 HA15 HA17 Coastal SS03 HA21 SS04 HA25 HA20 SS02 Golf SS05 SS06 Live Zone FUZ SS01 Whitford Marae Live Zone FUZ

HA18 Community HA09 HA08 Golf

A3 SCALE 1:10,000

0 100 200 300 400 500 m

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NOTES:

HH - NESCS Human Health, Env - Environmental Health. Potential contamination sources listed in report. Basemap Aotearoa New Zealand Hillshade - Alpha: Eagle Technology, Land Information New Zealand. NZ Topographic Relief (Vector): Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.. NZ Imagery: Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

REV	DESCRIPTION	GIS	CHK	DATE
0	First version	RUKO	JORB	05/08/21

LOCATION PLAN: Auckland

PROJECT No.	1014358.5000	
DESIGNED	RUKO	DEC.21
DRAWN	RUKO	DEC.21
CHECKED	JORB	DEC.21
APPROVED		DATE

CLIENT **BEACHLANDS SOUTH LIMITED PARTNERSHIP**

PROJECT **CONTAMINATION SAMPLING**

TITLE BEACHLANDS - SAMPLE LOCATION MAP - 110 JACK LACHLAN DRIVE

SCALE (A3) 1:10,000 FIG No. FIGURE 5.1 REV 0

T:\Auckland\Projects\1014358\1014358.5000\WorkingMaterial\GIS\Maps_Documents\210720.RUKO.Sampling locations map\210720.RUKO.1014358.5000.Contam sample map\210720.RUKO.1014358.5000.aprx Layout: Site 620 2021-Jul-30 2:45 PM Drawn by RUKO

LEGEND

- Surface Sample, Investigation
- Hand Auger, Investigation
- Formosa Property Boundary
- Site 620 Property Boundary

Inferred potential contamination sources

Type

- Gully (HAIL I)
- Potenrial former spray race and disturbed area (HAIL A8)
- Tyre stockpile

HA01

HA01
HA02
HA03
HA04
HA05

A3 SCALE 1:5,600

0 100 200 300 400 500 m

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NOTES:

Basemap Aotearoa New Zealand Hillshade - Alpha: Eagle Technology, Land Information New Zealand. NZ Imagery: Sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 New Zealand licence . NZ Topographic Relief (Vector): Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.

REV	DESCRIPTION	GIS	CHK	DATE
0	First version	XXXX	YYYY	10/09/19

Auckland

Auckland

PROJECT No.	1014358.5000	
DESIGNED	RUKO	JUL.21
DRAWN	RUKO	JUL.21
CHECKED		
APPROVED		DATE

CLIENT **BEACHLANDS SOUTH LIMITED PARTNERSHIP**

PROJECT **CONTAMINATION SAMPLING**

TITLE BEACHLANDS - SAMPLE LOCATION MAP - 110 JACK LACHLAN DRIVE

SCALE (A3) 1:5,600 FIG No. FIGURE 5.2 REV 0

6 Intrusive field investigation

6.1 Rationale

Intrusive investigations were undertaken at 110 Jack Lachlan Drive and 620 Whitford-Maraetai Road to establish if the identified contaminant sources have resulted in soil contamination at the site and provide information on earthworks management particularly to protect risks to human health and for soil disposal purposes. The investigations were also undertaken to determine potential future consenting requirements under the NESCS and Auckland Unitary Plan (AUP).

6.2 Investigation design

An intrusive investigation was undertaken by T+T in September 2021. The sampling locations were targeted at the potential contaminant sources described in **Table 5.1**, to achieve general coverage across the site and to align with testing previously undertaken by Fraser Thomas.

The investigation comprised surface samples at 10 locations, the excavation of 25 augered boreholes to a maximum depth of 1.0 metres below ground level (m bgl), visual observations of subsurface conditions and the collection of soil samples for laboratory analysis.

Additional sampling was undertaken by T+T in November 2021 at four locations (HA103, HA103a, HA103b, and HA103c) in the vicinity of HA06. The purpose of the sampling was to assess whether the reworked soil, including gravel, in this area could be classified as 'clean fill'.

6.3 Site observations

The geology observed during the intrusive investigation is discussed in **Section 2.3.2**. The following features were observed during the intrusive investigation:

- 110 Jack Lachlan Drive (Formosa Golf Course):
  - Key observations made during soil sampling at the Formosa Golf Course were:
    - Topsoil comprising of a brown to dark brown SILT/ silty CLAY with fibrous organics and occasional gravels was observed from ground level in all locations. Topsoil ranged between 0.1 – 0.3 m in thickness.
    - Yellow/orange silty CLAY was observed underlying the topsoil in all locations from the Formosa Golf Course to termination depths of approximately 0.5 m bgl.
- 620 Whitford-Maraetai Road:
  - Five (5) hand augered boreholes were advanced in the gulley area to determine the potential of filling south of what is understood to be a former equestrian area. Observations made during the investigations included:
    - Topsoil comprising of a brown silty CLAY with fibrous organics was observed in all locations during this investigation from ground surface. Topsoil was observed to be 0.1 – 0.4 m in thickness.
    - Orange silty CLAY was observed to the termination depth of the hand auger between 0.7 – 0.8 m bgl in all locations during this investigation. Some gravel was observed in HA03 between 0.5 – 0.7 m bgl. HA03 was located on the southern bank of the former equestrian track and may be an indication of filling or reworking of material.

6.4 Soil sampling procedure and data quality

Sampling and analysis were conducted in general accordance with the MfE Contaminated Land Management Guidelines[7] and NZ Asbestos in Soil Guidelines[8].

- New gloves worn for collection and placement of each sample into laboratory supplied containers.
- Non-dedicated sampling equipment was decontaminated between sampling locations using Decon-90 (a phosphate-free detergent) and freshwater rinses.
- Soils encountered were logged in general accordance with the NZ Geotechnical Society guidance.
- Preservation of samples with ice during transport from the field to the laboratory, travelling under chain of custody (CoC) documentation.
- Compliance with laboratory sample holding times was maintained.
- Laboratory testing by an accredited laboratory.

The laboratory testing was undertaken by Hill Laboratories Ltd, which is accredited for the analysis undertaken and audited annually by International Accreditation New Zealand (IANZ). The laboratory's quality control measures include testing of blanks with all batches of samples and frequent replicates and spikes, along with peer review of worksheets. Standard laboratory QA/QC reports were not examined as part of this project but are available from the laboratory on request. No anomalies were reported by the laboratory.

In addition to standard laboratory QA/QC, a quantitative measure of the overall variability or precision of the soil results was undertaken independently of the laboratory by analysis of a duplicate pair of samples collected from the site and calculating the relative percentage difference (RPD) of the metal results. The RPDs were calculated as follows (where Co is the primary sample concentration and Cd is the duplicate sample concentration):

$$RPD = \frac{(C_0 - C_d) \cdot 100\%}{\frac{(C_0 + C_d)}{2}}$$

Four duplicate samples were collected in the field during the investigation. QA/QC analytical results are presented in **Table F1, Appendix F**.

It is typically considered acceptable (refer to MfE Contaminated Land Management Guidelines No. 5) if an RPD range of less than 50% is achieved for soil samples. All parameters fall within this range.

6.5 Evaluation criteria

The soil testing data has been evaluated according to the requirements of the regulatory framework and applies to the site as follows:

- For the protection of human health:
  - For chemical contaminants:
    - The results have been compared to all pathways of the NESCS Contaminant Standard (SCS) to support the proposed plan change to allow for change of land use. Residential land use criteria have been adopted to be conservatively used as a proxy.

[7] Ministry for the Environment. Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soil (Revised 2011).
[8] BRANZ Ltd, 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil.

- For asbestos:
  - For the semi-quantitative assessment of asbestos in soil, commercial/industrial and high-density residential land use Asbestos in Soil Guidelines criterion for ACM (i.e. > 7 mm fraction), and 'all site uses' for asbestos fines (AF) and fibrous asbestos (FA) (i.e. < 2 mm fraction).
- For discharges to the environment:
  - The Permitted Activity (PA) Soil Acceptance Criteria as defined in Section E30.6.1.4 of the Auckland Unitary Plan – Operative in part (AUP).
  - Given that volcanic soils were encountered in one part of the site, the published volcanic concentrations for Auckland described in the Auckland Regional Council *"Technical Publication 153 – Background Concentrations of Inorganic Elements in Soils from the Auckland Region"* has been adopted for the site.
- For soil disposal (relevant for development phase of works):
  - Given the geology encountered during the site investigation, the published volcanic background concentrations for Auckland described in the Auckland Regional Council *"Technical Publication 153 – Background Concentrations of Inorganic Elements in Soils from the Auckland Region"* (and cited in Section E30.6.1.4 of the AUP) are used as a basis for acceptance of soil to clean fill sites.
  - For an initial assessment of acceptance of materials to managed fill sites, the results have also been compared to typical acceptance criteria for the Ridge Road disposal facility.

6.6 Laboratory results

35 samples (including four duplicate samples) were analysed for heavy metals, PAHs, OCPs and, and 24 samples were analysed for semi-quantitative asbestos in soils. A summary of the soil results is provided in **Table F2**. Laboratory transcripts are provided in **Appendix F.**

The analytical results show:

- For the protection of human health:
  - Concentrations of arsenic exceeded the NESCS residential (10% produce) criteria in sample SS09 collected along the northern boundary of Formosa Golf Resort.
  - Asbestos was not detected in the samples analysed.
- For discharges to the environment:
  - All analyte concentrations were below the AUP Permitted Activity Criteria (Discharge).
- Background/ disposal criteria:
  - Natural/topsoil material:
    - Reported concentrations of contaminants were below the published background concentrations for volcanic soils in Auckland in samples.
  - Fill material:
    - Fill material and underlying topsoil around SS09 (area of minor oil staining and potential borrow disposal area) – arsenic concentrations exceed the NESCS for residential 10% produce, and PAHs were reported above the published background concentrations for volcanic soils in Auckland. Soil in this area, if proposed to be removed off-site during future development, should be disposed of to a managed fill facility.

- Fill material and underlying topsoil around HA06 – perylene exceeded the published background concentrations for volcanic soils in Auckland, however additional sampling undertaken in November 2021 did not report concentrations of contaminants above published background concentrations for volcanic soils in Auckland. Soil from this area, if proposed to be removed offsite during future development, should therefore be disposed of to a clean fill facility.

7 Conceptual site model

A conceptual model as defined by the MfE Contaminated Land Guideline No. 5, sets out known and potential sources of contamination, potential exposure pathways, and potential receptors. For there to be an effect from the proposed activity there has to be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

A conceptual site model (CSM) has been developed for the proposed redevelopment of the site. The CSM takes into account the available information about the site, and our understanding of the potential effects on human health and the environment. The model is presented in **Table 7.1**.

Table 7.1: Conceptual site model

Source	Pathway	Receptors	Pathway assessment	Human Health/Environmental Effects
110 Jack Lachlan Drive				
Soil containing elevated concentrations of arsenic outside the hazardous chemical stores (T+T 2021), and arsenic and zinc in the gulley fill material (Fraser Thomas 2012).	Dermal contact Ingestion of soil Inhalation of dust	On-site - Future and current site users On-site – maintenance/excavation and other on-site workers during soil disturbance Off-site – workers and general public in vicinity of the disposal site receiving excavated materials	Complete – for residential land use	Negligible if: • Appropriate controls are implemented during excavation works • Impacted soil is removed off-site or capped on-site
	Migration of sediment to the environment		Potentially complete	Negligible if: • Materials are disposed to an appropriate facility and capped
Existing on-site wastewater treatment and disposal to land	Further analysis to be carried out prior to soil disturbance to confirm, although we understand from the client that this issue has been rectified. Low potential for leached contaminants into underlying soil. Contamination leached is usually restricted to near surface soils.			
620 Whitford-Maraetai Road				
Gulley fill potentially containing asbestos (Fraser Thomas 2012)	Inhalation of dust	On-site - Future and current site users On-site – maintenance/excavation and other on-site workers during soil disturbance	Potentially complete	Negligible effects if: • Appropriate controls are implemented during excavation works • Impacted soil is removed off-site
712 Whitford-Maraetai Road				
Historic filling activities and buildings comprising ACM (and potential lead-based paint).	Further analysis to be carried out prior to soil disturbance to confirm.			

The CSM shows that arsenic and zinc concentrations could potentially pose a risk to human health during future development of the site, and works will be required to ensure that exposure is minimised. All other analyte concentrations were below NESCS and AUP criteria, and therefore are not considered to be a source of potential contamination or pose a risk to human or environmental health.

The assessment of the existing on-site wastewater treatment plant and effluent disposal to constructed wetland areas has thus far been limited to one sample location. For the purposes of this evaluation the constructed wetlands and treatment plant have been considered a confirmed HAIL activity and retained as a potential source of contamination. Further testing is recommended as part of the pre-works sampling for soil disturbance consents.

Suspected ACM was observed in the gulley fill by Fraser Thomas, however testing undertaken in this area did not report concentration of asbestos above the Asbestos in Soil Guidelines. Fill material and general rubbish identified by Fraser Thomas was not observed during the T+T intrusive investigation. This assessment would need to be confirmed by pre-works testing as part of the Site Management Plan (SMP) to confirm whether asbestos is present.

There is potential for contamination in underlying soil at 712 Whitford-Maraetai Road due to former land uses identified during the desktop review as identified in **Table 7.1**. No sampling was undertaken as part of this investigation. Further testing is recommended as part of the pre-works sampling for any subdivision, change of use or soil disturbance consents as required under the current regulatory framework of the NESCS.

The implications for consenting and managing identified contamination are discussed in further detail in the following section.

8 Development implications

8.1 Regulatory implications

The rules and associated assessment criteria relating to the control of contaminated sites in the Auckland region are specified in the following documents:

- NESCS.
- AUP.
- Health and Safety at Work (Asbestos) Regulation 2016 (Asbestos Regulations).

The need, or otherwise, for contamination-related resource consents for the site redevelopment has been evaluated against these regulatory requirements.

8.1.1 NESCS

The NESCS applies to specific activities on land where a HAIL activity has or is more likely than to have occurred. Activities covered under the NESCS include soil disturbance, soil sampling, fuel systems removal, subdivision and land use change.

110 Jack Lachlan Drive and 620 Whitford-Maraetai Road

This investigation indicates that HAIL activities have occurred at the site as outlined in **Section 5, Table 5.1.** The areas identified at HAIL are outlined **Table 2.1** and present in **Figure 1.1.**

Table 8.1: Areas of HAIL

Identified HAIL	Area (m^2)
Potential hazardous storage area	2,508
Constructed wetland	7,559
Sewage plant	884
Gulley	1,395 [to be updated if additional sampling is carried out to determine the extent of the gulley]
Potential former spray race and disturbed area	341
Total area of HAIL	12,687

Soil Disturbance

The volume of soil disturbance would be determined at the time of future development following the proposed rezoning process. Based on the total area of identified HAIL areas comprising 12,687 m^2, the permitted soil disturbance and disposal thresholds under the NESCS are calculated to be:

- Soil disposal – 127 m^3 per year.
- Soil disturbance – 635 m^3.

Any disturbance or disposal of soil exceeding these thresholds will require as consent as a controlled activity or a restricted discretionary activity (depending on whether the level of contamination is above human health standards) under Regulation 9 of the NESCS regulations.

We anticipate that as a requirement of consent, Council will require a SMP in order to demonstrate how the site works will be managed to prevent exposure to workers, the public and environmental receptors during works.

712 Whitford-Maraetai Road

Based on the information reviewed as part of this Desk Study, it remains unclear whether the site would be considered a piece of land under Regulation 5(7) of the NESCS. This is because all of the HAIL activities identified are potential only and would require sampling and testing to make a judgement. If investigations identify contaminant concentrations above human health criteria for the land use, then the NESCS would apply and it is likely that soil disturbance consents would be required for any significant redevelopment. Sampling will be undertaken prior to consent applications for soil disturbance, subdivision or change of use.

Change in use and subdivision

The potential change in use and subdivision have been assessed against the Permitted Activity standards under the NES Soil Regulations 8(4) as detailed in **Table 8.2** below.

Table 8.2: NES Soil Permitted Activity conditions for subdividing or changing land use

NES Soil – Subdividing or changing land use permitted activity conditions (Regulation 8(4))		Assessment
a	A preliminary site investigation of the land or piece of land must exist.	COMPLIES - This report.
b	The report on the preliminary site investigation must state that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.	DOES NOT COMPLY – Soil results to date indicate that a risk to human health exists with respect to the future proposed development.
c	The report must be accompanied by a relevant site plan to which the report is referenced.	COMPLIES – Figures within this report.
d	The consent authority must have the report and plan.	CAN COMPLY – On submission of this report to Auckland Council.

The private plan change application to rezone the land will enable future urban development as indicated on the Structure Plan. At the time of future development involving scenarios of soil disturbance, subdivision or change of use, and due to the concentration in contaminants in soil results to date, the NESCS will apply to the site under Regulation 8(4).

Future development of the site will require a consent as a controlled activity or a restricted discretionary activity (depending on whether the level of contamination is above human health standards) under Regulation 9 of the NESCS regulations.

Any future development of sites within the plan change area that are not covered by this report will require an assessment prior to rezoning.

8.1.2 AUP

Intrusive ground investigations undertaken at the site have determined the concentrations of zinc within the gulley fill exceeded the permitted activity criteria set out in Table E30.6.1.4.1 of the AUP. Therefore, resource consent for the discharge of contaminants at the time of carrying out the proposed development that would be enabled by the plan change, is likely to be required under the AUP's contaminated land related rules if the volume of soil disturbance is expected to exceed 200 m^3.

8.1.3 Asbestos regulations

Current structures at the site were constructed in the late 1990s therefore are unlikely to contain asbestos. However, historic and current building structures at 712 Whitford-Maraetai Road site were on-site in the late 1980s. The Asbestos Regulations require an asbestos survey to be undertaken for any pre-2000 structure prior to demolition of the structure.

We have been provided with an asbestos management survey[9] by the client for 110 Jack Lachlan Drive. The surveyed buildings included A: Main Clubhouse, B: Condo Villas (50 total units), D: Driving Range, E: Tee Off Kiosk, and F: Gym Building. The report notes that due to time constraints, access could not be gained to Driving Range (D) and Tee Off Kiosk (E). We have been provided an email[10] by the client confirming that no asbestos was identified in the Tee Off Kiosk and Driving Range.

Asbestos was not detected in the samples analysed during the 2021 investigation, however it is possible that unexpected asbestos contamination could be discovered during earthworks across the site, and suspected ACM was observed in the gulley fill investigated by Fraser Thomas. The SMP should outline the pre-construction works sampling to establish the health and safety controls (under the Asbestos in Soil Guidelines) and soil disposal requirements for the gulley fill. The SMP should also include procedures for the management of unexpected contamination of this nature. These controls and procedures are required under the NESCS Regulations and existing provisions of the AUP.

8.1.4 Earthworks and disposal implications

Soil disposal implications are provided here for consideration for future earthworks. Based on the findings of this investigation, and taking into consideration Fraser Thomas 2012, the following implications have been noted for 110 Jack Lachlan Drive and 620 Whitford-Maraetai Road (the additional soil testing recommended for 712 Whitford-Maraetai Road will determine any earthworks and disposal implications from this property):

- Apart from the elevated concentrations of arsenic and zinc, and the potential for ACM in the gulley, standard earthworks controls are likely to be appropriate unless unexpected conditions are encountered during development work.
- If geotechnically suitable, spoil from outside the identified HAIL areas can be reused on-site. This should be included into the planning and design of the site redevelopment to promote environmentally sustainable outcomes and minimise disposal cost.
- If soil is to be removed from the site as part of future development, the implications for offsite disposal are outlined below:
  - Natural/topsoil material:
    - Reported concentrations of contaminants were below the published background concentrations for volcanic soils in Auckland (which is relevant to the site). Soil removed off-site can be disposed as cleanfill.
    - Concentrations of dieldrin, arsenic, cadmium, chromium, copper, and zinc were above the published background concentrations for volcanic soils in Auckland within the vicinity of the historic spray race at 620 Whitford-Maraetai Road. Soil in this area should be disposed of to a managed fill facility.

[9] Precise Consulting, June 2019, Asbestos Management Survey - Formosa Golf Resort, 110 Jack Lachlan Drive, Beachlands, Auckland 2571, JS208092/J022864.
[10] Email – 2 May 2020 – From: Precise Consulting (James Robinson), To: Craig Lyford, Subject: Formosa Golf Resort – Asbestos Survey Revisit.

- Fill material:
  - Fill material and underlying topsoil around SS09 (area of minor oil staining and potential borrow disposal area) – arsenic concentrations exceed the NESCS for residential 10% produce, and PAHs were reported above the published background concentrations for volcanic soils in Auckland. Soil in this area should be disposed of to a managed fill facility.
  - Fill material and underlying topsoil around HA06 - perylene concentrations exceeded the published background concentrations for volcanic soils in Auckland, however additional sampling undertaken in November 2021 did not report concentrations of contaminants above published background concentrations for volcanic soils in Auckland. Soil in this area, if proposed to be removed off-site during future development, should be disposed of to a managed fill facility.
  - Fill material in the gulley at 620 Whitford-Maraetai Road – arsenic exceeded the NESCS for residential 10% produce, zinc exceeded the AUP discharge criteria, and concentrations of other metals exceeded the published background concentrations for volcanic soils in Auckland. Soil from this area should therefore be disposed of to a managed fill facility. This assessment would need to be confirmed by pre-works testing as part of the SMP to confirm whether asbestos is present.

9 Conclusions and Recommendations

9.1 Conclusions

T+T has undertaken ground contamination investigations at 110 Jack Lachlan Drive and the neighbouring property at 620 Whitford-Maraetai Road, and desktop assessment at 712 Whitford-Maraetai Road, to determine if any potentially contaminating activities have occurred (potentially impacting soil quality) and therefore if the proposed land use changes will be subject to National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NESCS) or if contaminated soil provisions in Auckland Unitary Plan (operative in part) are applicable, and to provide an assessment of contamination-related soil handling and disposal implications.

The key findings of the investigation are summarised below:

Desk based assessment and potential for contamination

Previous investigations undertaken at the site identified potential sources of contamination, as listed on the HAIL, within the proposed structure plan and plan change area. Sources of potential contamination included areas of uncontrolled fill material, application of pesticides, former livestock spray race, sewage/wastewater treatment, fuel storage, ACM in building materials, and lead based paints.

Previous soil testing undertaken by Fraser Thomas in 2011 had identified metals contamination (above NESCS, AUP and background levels) in fill material within a gulley (HA01-HA05) on 620 Whitford-Maraetai Road and dieldrin contamination above background levels within a historic spray race.

A site walkover and desktop assessment were undertaken at 712 Whitford-Maraetai Road in December 2021. Sources of potential contamination included ACM in building materials, potential use of lead-based paints and potentially filling activities of a single gulley when forming the house site. Soil sampling was not undertaken as part of this desktop assessment.

Intrusive site investigation findings

- Arsenic was reported in exceedance of the NESCS for residential 10% produce at location SS09 collected from 110 Jack Lachlan Drive. PAHs above background concentrations (assumed to be the limit of reporting) were also reported for SS09.
- Perylene was reported above published background concentrations for volcanic soils in fill at one location (HA06). Additional sampling undertaken in November 2021 did not report concentrations of contaminants above published background concentrations.
- Concentrations of potential contaminants in natural material and topsoil were within background ranges for volcanic soils.
- Asbestos was not detected in any of the samples analysed.
- No other contaminant concentrations in T+T's investigation exceeded the NESCS, however, arsenic concentrations above the NESCS had been previously detected in the gulley on 620 Whitford-Maraetai Road by Fraser Thomas. Zinc had also been previously detected in exceedance of the AUP Permitted Activity Criteria (Discharge) in fill within a gulley. Concentrations of dieldrin were detected above background concentrations, but below human health and environmental criteria, in samples from the area of the historic spray race collected by Fraser Thomas in 2012.

Contaminated land resource consents

- This assessment has identified no evidence to suggest the presence of contamination that would prevent the proposed rezoning and change in use under the Structure Plan and Plan Change.
- Resource consent under the soil disturbance regulations of the NESCS will be required if the permitted activity thresholds within the HAIL areas of the site are exceeded (127 m^3 of soil disturbance or 635 m^3 of soil needing disposal. Disturbance or disposal of soil exceeding these thresholds will require a controlled activity or restricted discretionary consent (depending on the level of the contamination within the HAIL area) under Regulation 9 of the NESCS regulations.
- A resource consent for the discharge of contaminants is likely to be required under the AUP's contaminated land related rules if the volume of soil disturbance is expected to exceed 200 m^3.
- No testing has been undertaken at 712 Whitford-Maraetai Road. Testing of soils will be carried out prior to applications for soil disturbance, subdivision or change of use and would be assessed against the current NESCS and AUP framework for contaminated land as part of the necessary Detailed Site Investigation reporting.

Earthworks and disposal implications

Apart from the elevated concentration of arsenic and zinc, and the potential for ACM (noting the test results indicated no asbestos in the 620 gulley samples) in the 620 gulley (HA01 – HA05) at Site 620, standard earthworks controls in accordance with the AC Erosion and Sediment Control Guide[11] are appropriate unless unexpected conditions are encountered during development work.

Natural material at the site do not require off-site disposal from a contamination perspective as they are below NESCS-SCS and AUP discharge criteria soil acceptance criteria. However, if these soils require removal for redevelopment purposes (for example are geotechnically unsuitable material to build on), they may be disposed of as cleanfill.

Fill material and underlying topsoil around SS09 and in the 620 gulley at exceeded the NESCS and/or AUP discharge criteria. Soil from these areas will required disposal to a managed fill facility.

Intrusive investigations will be required in one gulley (that was filled when the house site was formed), and potentially around the existing house at 712 Whitford-Maraetai Road to assess potential contamination of underlying soils and if these need to be incorporated into the SMP.

9.2 Recommendations

This assessment has identified no evidence to suggest the presence of contamination that would prevent the proposed rezoning of land as shown in the Structure Plan and Plan Change.

A Site Management Plan (SMP) will be prepared to support future soil disturbance resource consent applications which describes how any potential ground contamination effects will be managed during the proposed works.

Soil testing will be carried out prior to the soil disposal consent applications, to determine the potential presence of contamination at the wastewater treatment plant, building footprint of the existing 'hazardous storage' area, and to assess the potential risks to human health and the environment at 712 Whitford-Maraetai Road.

Soil testing could also be carried out to delineate the, the 620 gully fill area for soil disposal purposes.

[11] Auckland Council, 2016, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region.

An asbestos building survey will be required prior to demolition of the building at 712 Whitford-Maraetai Road (if it is to be demolished). The results of the building survey and sampling for asbestos in soil will assist with determining the appropriate controls required under the Asbestos Regulations.

10 Applicability

This report has been prepared for the exclusive use of our client Beachlands South Limited c/- Russell Property Group, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

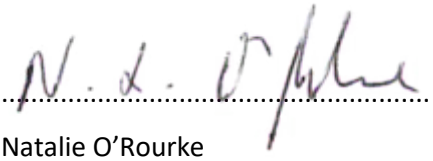
We understand and agree that this report will be used by Auckland Council in undertaking its regulatory functions in connection with the proposed plan change.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of subsoil away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
	
.....	.....
Carmen Thornton	Peter Millar
Environmental Scientist	Project Director

Reviewed by:



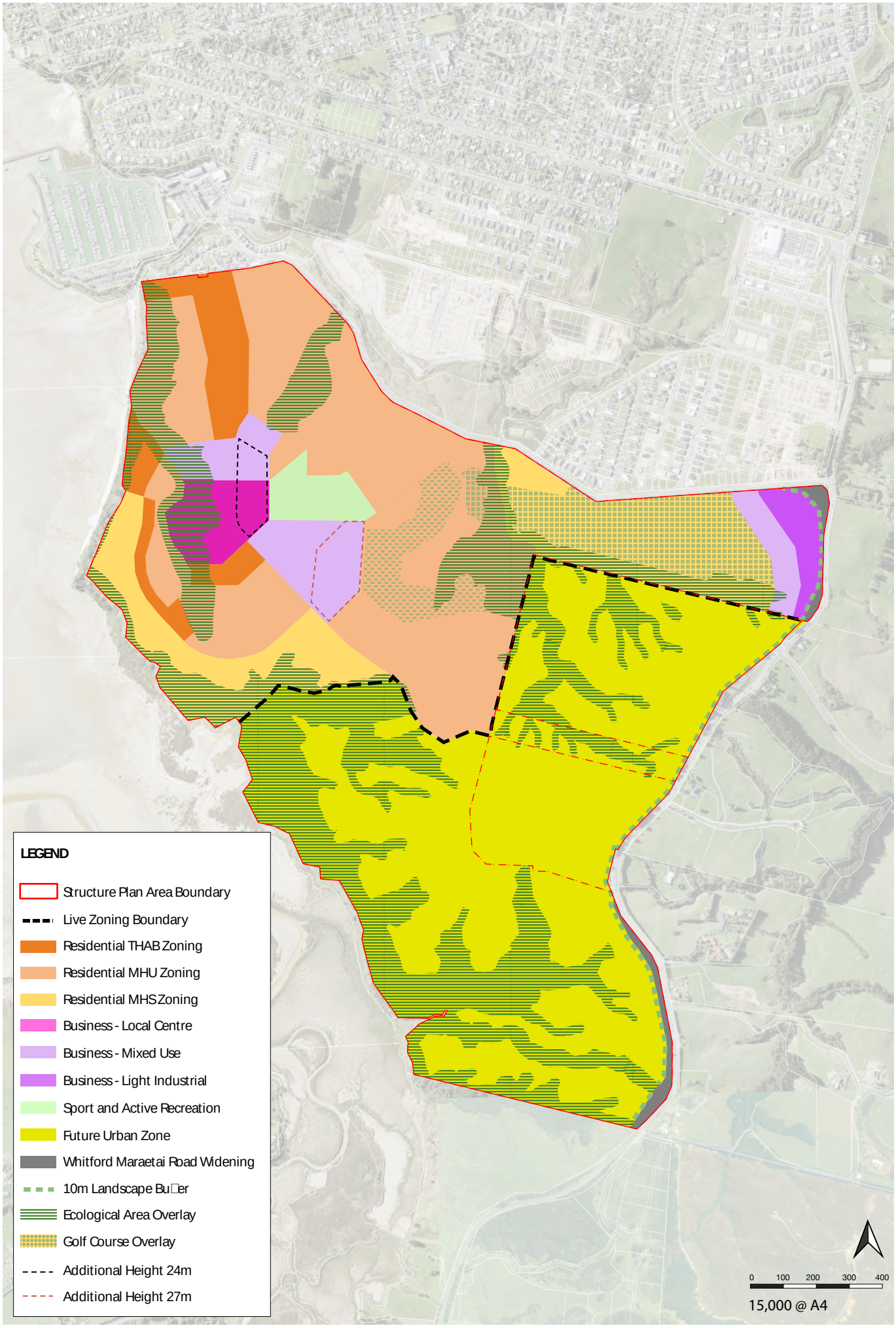
.....

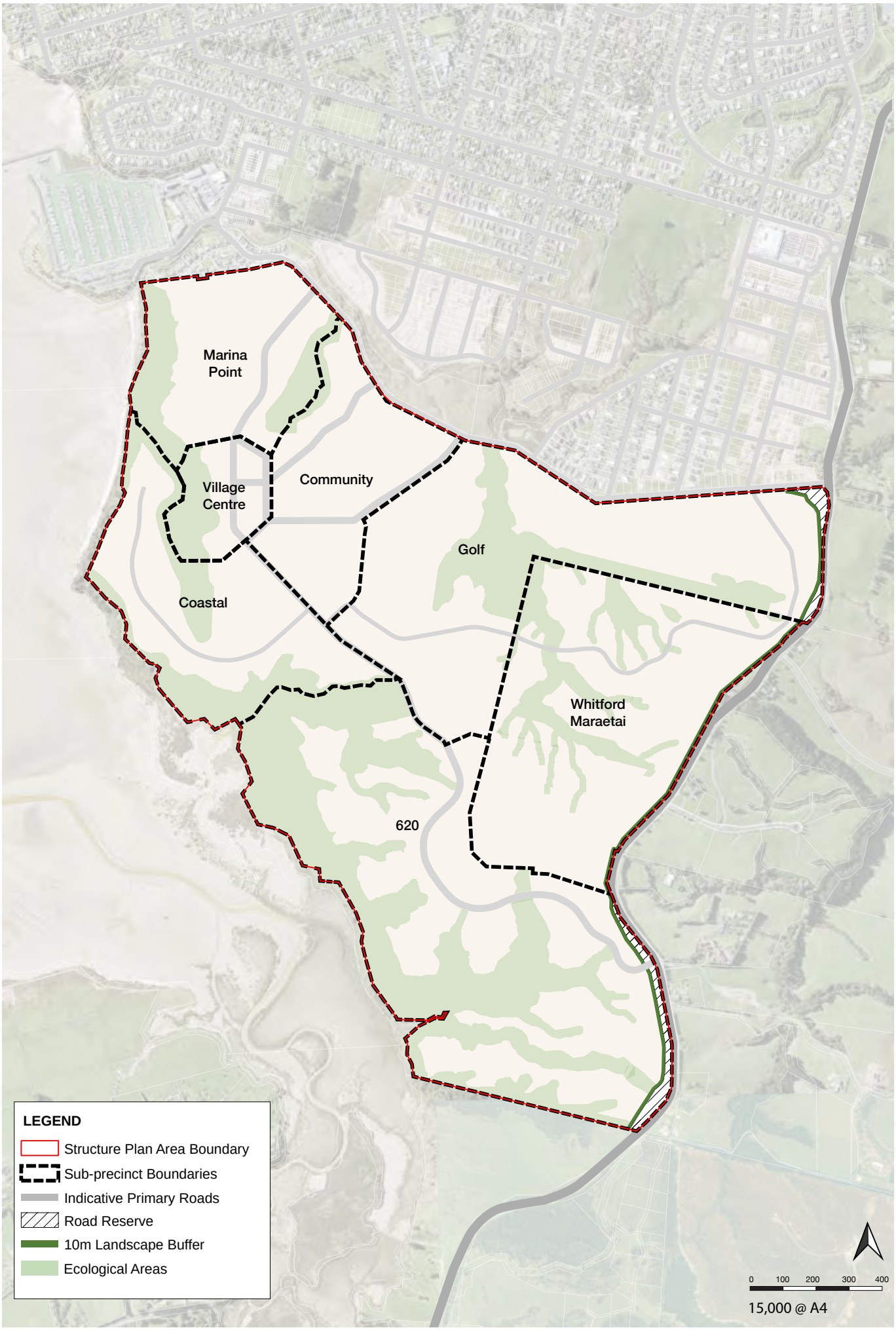
Natalie O'Rourke

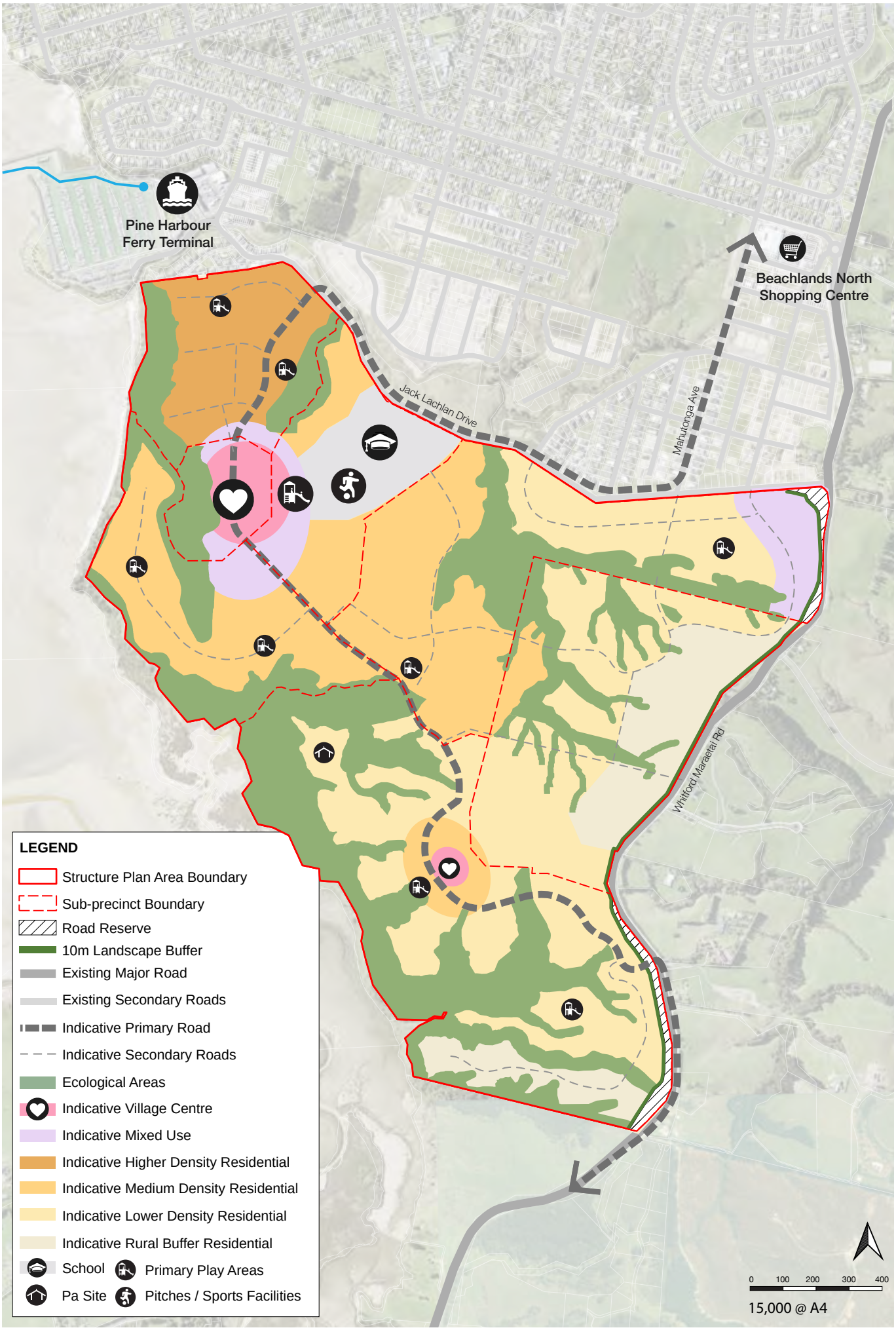
Senior Contaminated Land Consultant, CEnvP SC

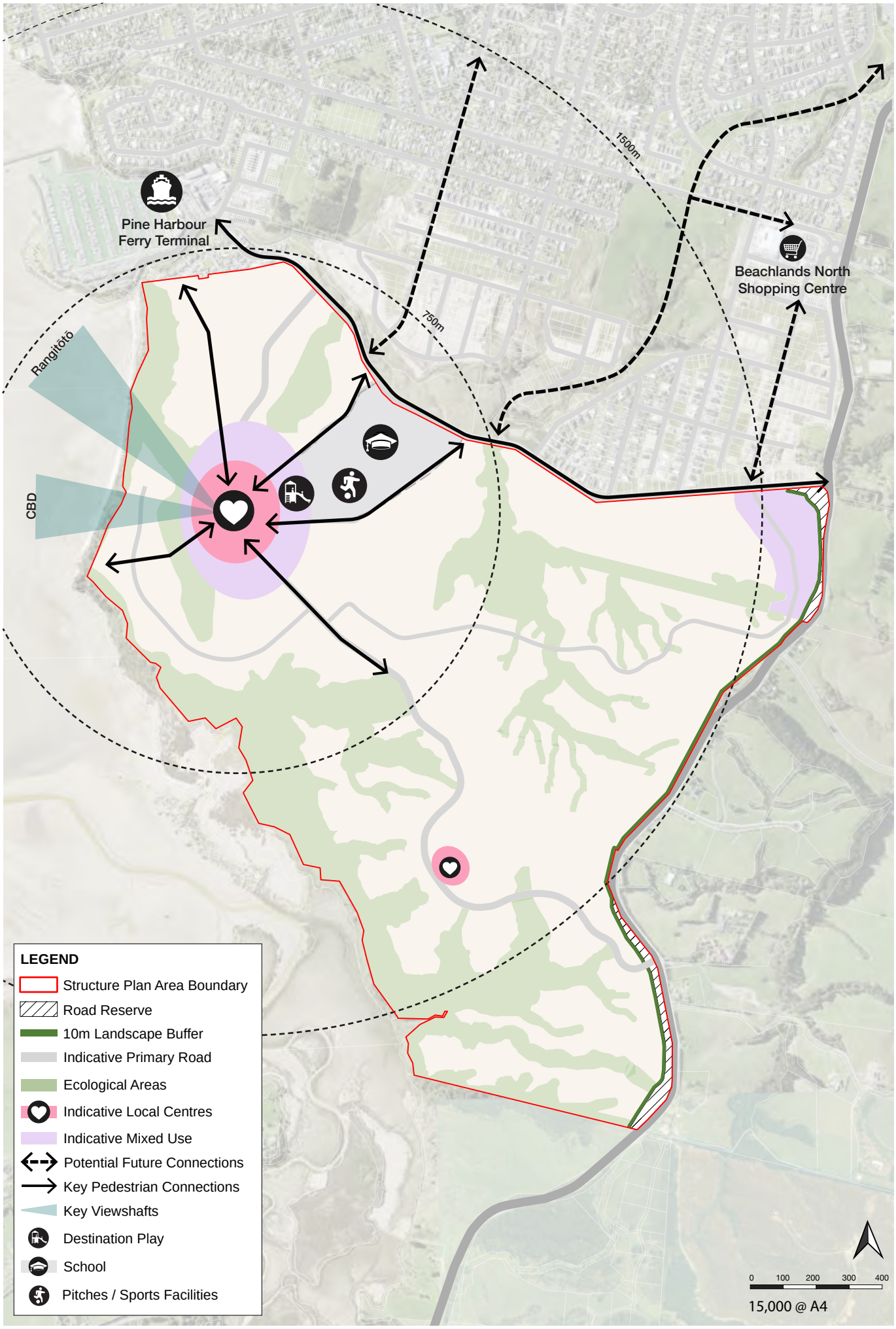
CAVE
\\ttgroup.local\files\aklprojects\1014358\1014358.5000\issueddocuments\dsi\03.02.2022_dsi report_final_v4.docx

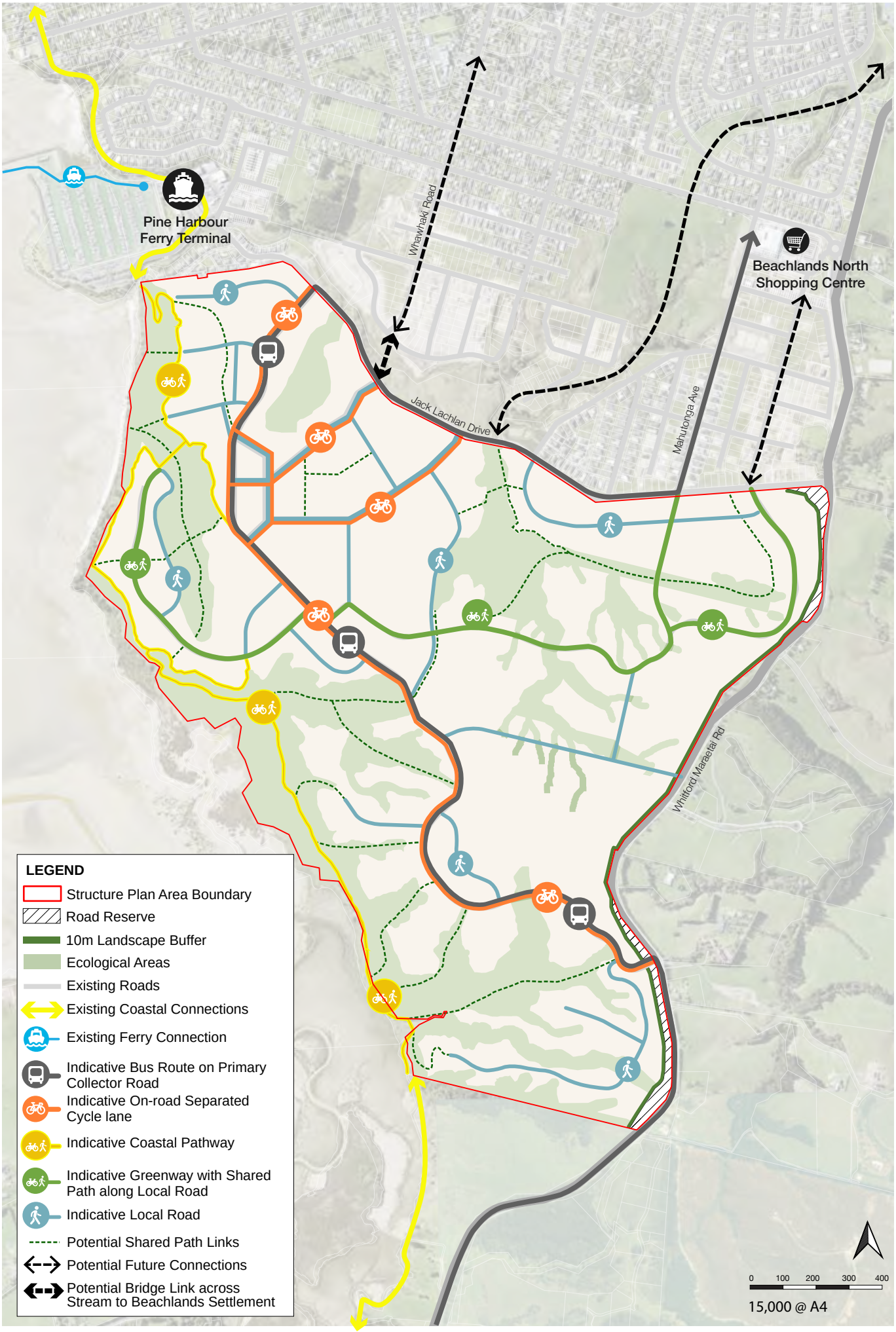
Appendix A: Structure Plan

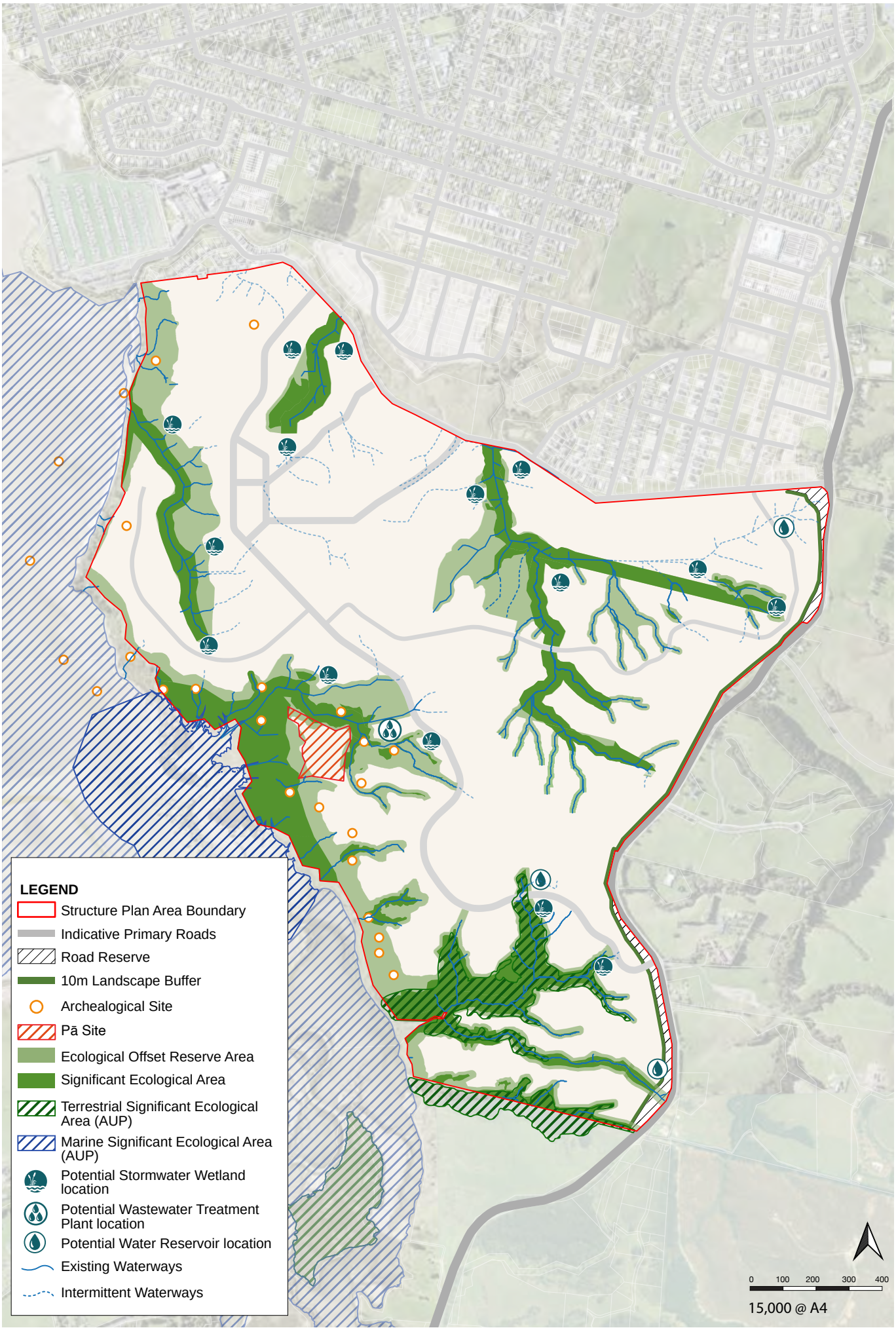

LEGEND
Structure Plan Area Boundary
Live Zoning Boundary
Residential THAB Zoning
Residential MHU Zoning
Residential MHS Zoning
Business - Local Centre
Business - Mixed Use
Business - Light Industrial
Sport and Active Recreation
Future Urban Zone
Whitford Maraetai Road Widening
10m Landscape Buffer
Ecological Area Overlay
Golf Course Overlay
Additional Height 24m
Additional Height 27m
0 100 200 300 400
15,000 @ A4

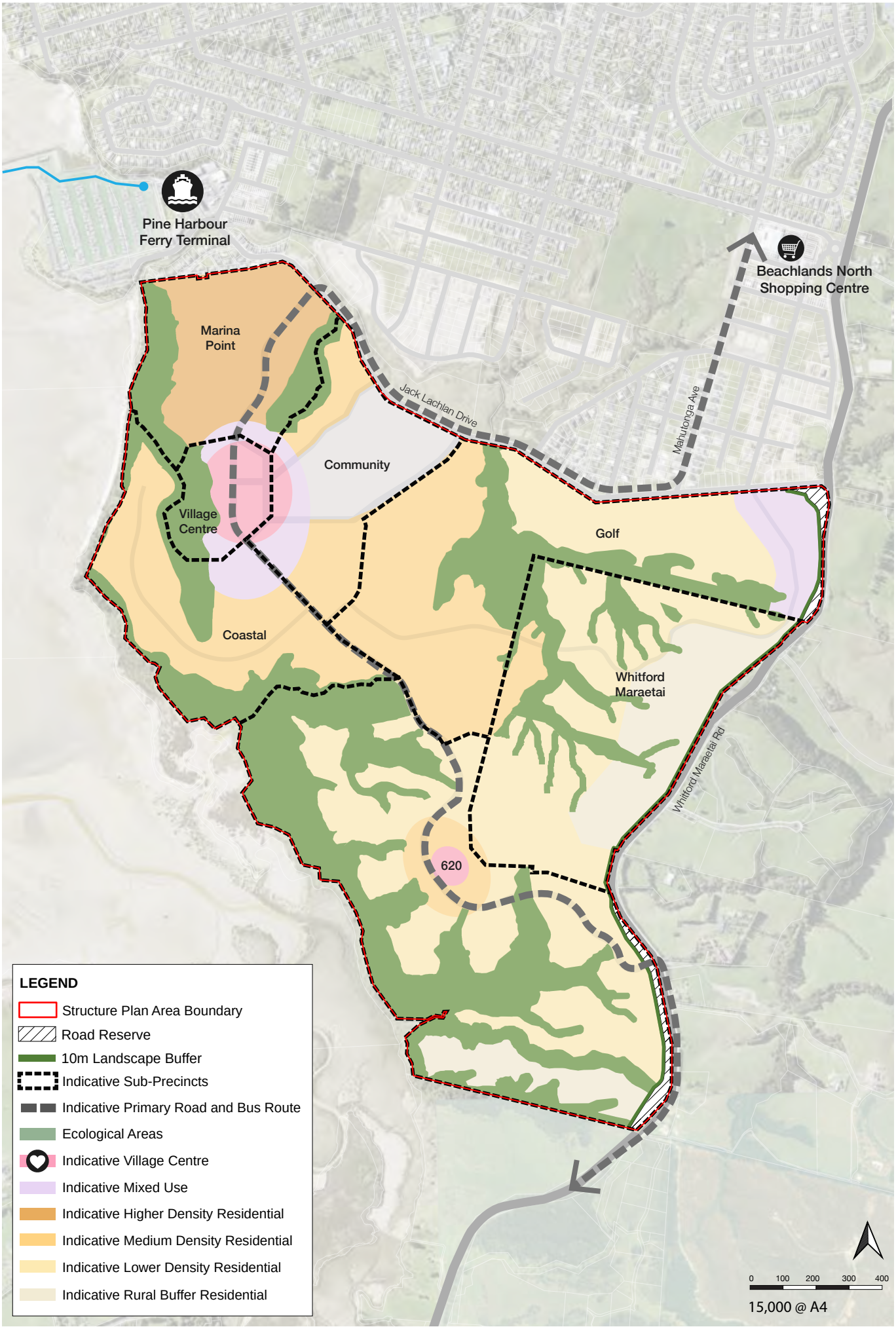

Marina Point
Village Centre
Community
Golf
Coastal
Whitford Maraetai
620
LEGEND
Structure Plan Area Boundary
Sub-precinct Boundaries
Indicative Primary Roads
Road Reserve
10m Landscape Buffer
Ecological Areas
0 100 200 300 400
15,000 @ A4

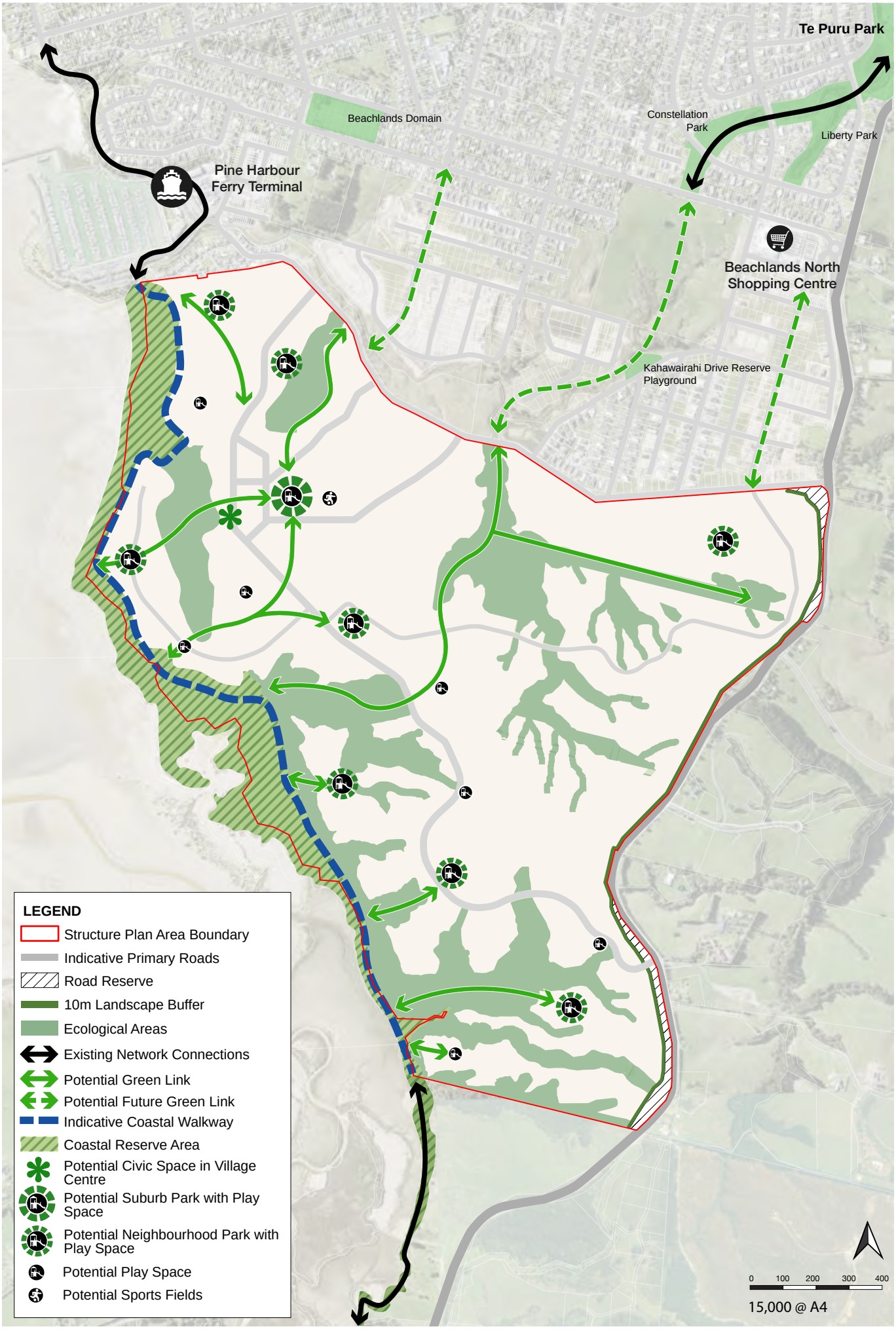

Pine Harbour
Ferry Terminal
Beachlands North
Shopping Centre
Jack Lachlan Drive
Mahutonga Ave
Whitford Maraetai Rd
LEGEND
Structure Plan Area Boundary
Sub-precinct Boundary
Road Reserve
10m Landscape Buffer
Existing Major Road
Existing Secondary Roads
Indicative Primary Road
Indicative Secondary Roads
Ecological Areas
Indicative Village Centre
Indicative Mixed Use
Indicative Higher Density Residential
Indicative Medium Density Residential
Indicative Lower Density Residential
Indicative Rural Buffer Residential
School
Primary Play Areas
Pa Site
Pitches / Sports Facilities
0 100 200 300 400
15,000 @ A4


Pine Harbour
Ferry Terminal
1500m
750m
Beachlands North
Shopping Centre
Rangitōtō
CBD
LEGEND
Structure Plan Area Boundary
Road Reserve
10m Landscape Buffer
Indicative Primary Road
Ecological Areas
Indicative Local Centres
Indicative Mixed Use
Potential Future Connections
Key Pedestrian Connections
Key Viewshafts
Destination Play
School
Pitches / Sports Facilities
0 100 200 300 400
15,000 @ A4


Pine Harbour
Ferry Terminal
Whawhaki Road
Jack Lachlan Drive
Mahutonga Ave
Beachlands North
Shopping Centre
Whitford Maraetai Rd
LEGEND
Structure Plan Area Boundary
Road Reserve
10m Landscape Buffer
Ecological Areas
Existing Roads
Existing Coastal Connections
Existing Ferry Connection
Indicative Bus Route on Primary Collector Road
Indicative On-road Separated Cycle lane
Indicative Coastal Pathway
Indicative Greenway with Shared Path along Local Road
Indicative Local Road
Potential Shared Path Links
Potential Future Connections
Potential Bridge Link across Stream to Beachlands Settlement
0 100 200 300 400
15,000 @ A4


LEGEND
Structure Plan Area Boundary
Indicative Primary Roads
Road Reserve
10m Landscape Buffer
Archealogical Site
Pā Site
Ecological Offset Reserve Area
Significant Ecological Area
Terrestrial Significant Ecological Area (AUP)
Marine Significant Ecological Area (AUP)
Potential Stormwater Wetland location
Potential Wastewater Treatment Plant location
Potential Water Reservoir location
Existing Waterways
Intermittent Waterways
0 100 200 300 400
15,000 @ A4


Pine Harbour
Ferry Terminal
Beachlands North
Shopping Centre
Marina
Point
Jack Lachlan Drive
Mahutonga Ave
Community
Village
Centre
Golf
Coastal
Whitford
Maraetai
Whitford Maraetai Rd
620
LEGEND
Structure Plan Area Boundary
Road Reserve
10m Landscape Buffer
Indicative Sub-Precincts
Indicative Primary Road and Bus Route
Ecological Areas
Indicative Village Centre
Indicative Mixed Use
Indicative Higher Density Residential
Indicative Medium Density Residential
Indicative Lower Density Residential
Indicative Rural Buffer Residential
0
100
200
300
400
15,000 @ A4


Te Puru Park
Beachlands Domain
Constellation Park
Liberty Park
Pine Harbour Ferry Terminal
Beachlands North Shopping Centre
Kahawairahi Drive Reserve Playground
LEGEND
Structure Plan Area Boundary
Indicative Primary Roads
Road Reserve
10m Landscape Buffer
Ecological Areas
Existing Network Connections
Potential Green Link
Potential Future Green Link
Indicative Coastal Walkway
Coastal Reserve Area
Potential Civic Space in Village Centre
Potential Suburb Park with Play Space
Potential Neighbourhood Park with Play Space
Potential Play Space
Potential Sports Fields
0 100 200 300 400
15,000 @ A4

Appendix B: Site Photographs

110 Jack Lachlan Drive and 620 Whitford-Maraetai Road

Photograph Appendix B.1: Facing west, storage of tyres observed along the western boundary of 620 Whitford-Maraetai Road.

Photograph Appendix B.2: View south-east towards Whitford-Maraetai Road from 620 Whitford-Maraetai Road. The south-eastern end of the site is grassed with no indication of stressed vegetation. The site slopes down in the western/north-western direction.

Photograph Appendix B.3: Looking south from 620 Whitford-Maraetai Road

Photograph Appendix B.4: Natural geology photographed at HA15.

Photograph Appendix B.5: Looking north/north-west, the Formosa wastewater treatment system which comprises of a series of concrete setting tanks was observed towards the centre of the golf course. Control room and above ground tanks observed in the photo.

Photograph Appendix B.6: Close up of concrete settling tanks observed at the wastewater treatment station.

Photograph Appendix B.7: View east towards Whitford-Maraetai Road taken from the north-eastern corner of the site.

Photograph Appendix B.8: View north-east from the north-eastern portion of the site towards Whitford-Maraetai Road.

Photograph Appendix B.9: View north-west towards the area of visual staining and Hazchem storage area.

712 Whitford-Maraetai Road

Photograph Appendix B.10: View south-west towards the storage shed and garage. Building materials were timber weatherboard and tin roof.

Photograph Appendix B.11: Storage of herbicides and fungicides on sealed concrete slab within the storage shed. Containers were labelled, Green glyphosate 510, Zelam Chlorocarb fungicide, Sprinter 700 DS and Relay

Photograph Appendix B.12: Containers stored on the shelving at the back of the shed were identified as: pest off, rabbit pellet, paint containers, fuel jerry can, combination sheep drench, Zapp Encore lice treatment for sheep and Conquest spot spray for pasture weeds.

Photograph Appendix B.13: View east towards Whitford-Maraetai Road of fruit trees and vegetable garden.

Photograph Appendix B.14: View south-west of the stock loading race.

Photograph Appendix B.15: View south-east towards the residential dwelling. Building materials consisted of timber weatherboard, tin, brick and copper.

Photograph Appendix B.16: View west towards the tennis court and fruit trees along the northern boundary.

Photograph Appendix B.17: View south towards the pond running through the centre of the site.

Photograph Appendix B.18: View west of pastoral land and bush occupying the remainder of the site.

Photograph Appendix B.19: View south-east towards 702 Whitford-Maraetai Road. Several beehives are visible along the fence line.

Photograph Appendix B.20: Stockpile or inorganic vegetation along the southern boundary. The vegetables as noted to be associated with a recent felled tree and bush clearing.

Photograph Appendix B.21: View east of inground septic tank system.

Photograph Appendix B.22: Sand and shells noted in the surface soils to the west of the residential dwelling.

Appendix C: Historical aerial photographs – 712 Whitford-Maraetai Road

Photograph Appendix C.1: 1955 aerial photograph (Source: Retrolens)

Photograph Appendix C.2: 1961 aerial photographer (Source: Retrolens)

Photograph Appendix C.3: 1968 aerial photograph (Source: Retrolens)

Photograph Appendix C.4: 1975 aerial photograph (Source: Retrolens)

Photograph Appendix C.5: 1987 aerial photograph (Source: Retrolens)

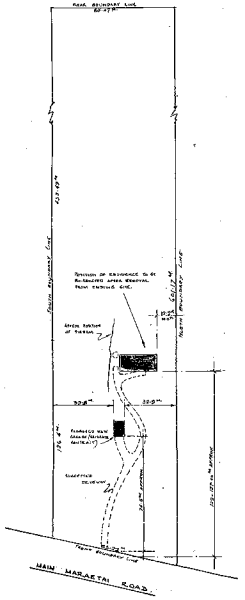
Photograph Appendix C.6: 1996 aerial photograph (Source: Auckland Council Geomaps)

Photograph Appendix C.7: 2001 aerial photograph (Source: Auckland Council Geomaps)

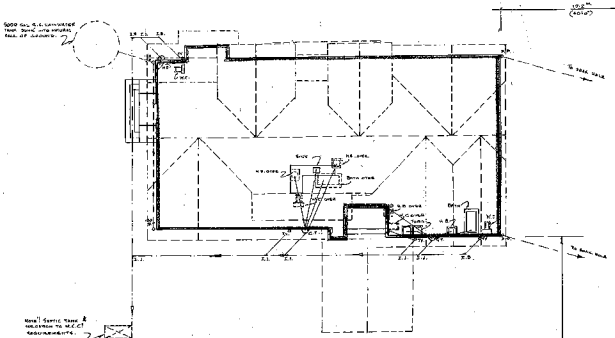
Photograph Appendix C.8: 2008 aerial photograph (Source: Auckland Council Geomaps)

Photograph Appendix C.9: 2017 aerial photographs (Source: Auckland Council Geomaps)

Appendix D: Property file



SITE & LOCATION PLAN
SCALE: 1:1000



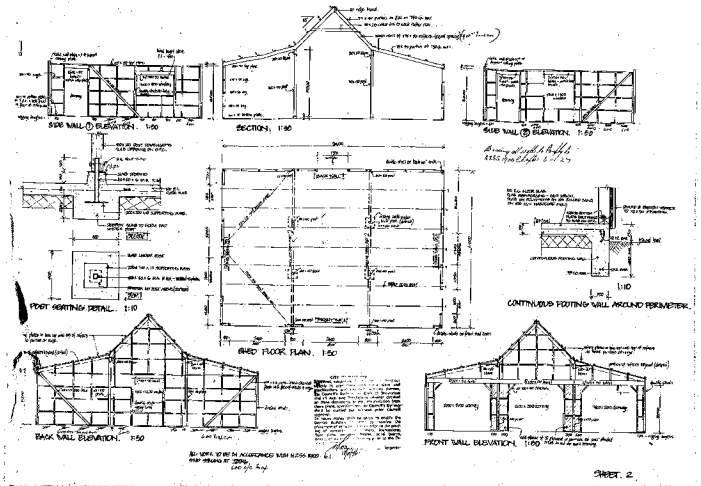
DRAINAGE PLAN
SCALE: 1:100

CITY OF MANUKAU
PLANNING EXAMINER
Application & Plans For
Approved
13-10-78

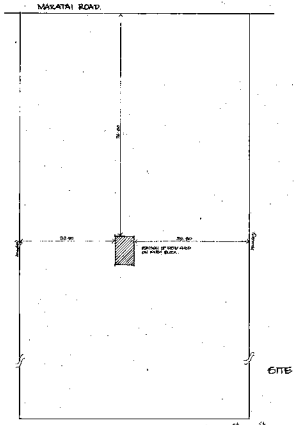
D. M. DAWSON & ASSOCIATES
RESIDENTIAL, COMMERCIAL & INDUSTRIAL DESIGNERS
CIVIC HOUSE, PICTON ST. HOWICK. PH. 48-410 BUS, 48-357 RES.

DRAINAGE PLAN FOR THE PROPOSED RE-SITING OF RESIDENCE FOR MR & MRS H. L. G. MASINDOE
AT LOT 6, D.P. 54105 - MAIN MARAETAI ROAD - R.D. HOWICK.

SCALE: 1:1000 & 1:100
JANUARY 1976



SHEET. 2.



SITE PLAN. 1:400

SHEET. 1.

1986

35 7004-6104

1505 ✓ 595

B

CITY OF MANUKAU

DATE RECEIVED 11/10/76 DATE RETURNED

ESTIMATED VALUE $20 700.00

APPLICATION for BUILDING PERMIT

OWNER OF PROPERTY Mc INDOE

Lot No. 4 D.P. 54105

Road MAIN RD ~~MARAETAI~~ PAKURANGA

~~MARAETAI~~ MAIN RD

WHITford Maraetai

FOR OFFICE USE ONLY

Please Refer to [X][5][ ] For Action

~~1. WEAR ... MAIN ... ROAD~~

Note: Roof shingles are to be Fibrolite Shingles (instruction received from Architect 27/10/76)

MANUKAU CITY COUNCIL			
	APPROVED FOR PERMIT	INITIALS	DATE
1	Building By-Laws		8-11-76
2	Plumbing Drainage		2-11-76
3	Health		
4	Structural Engineer		
5	Town Planning		26.10.76
6	Egress		
7	Dangerous Goods		
8	Drainage Engineer		

REFER TO BACK OF FORM FOR ENDORSEMENTS OR COMMENTS

CITY OF MANUKAU

Application For Building Permit

Perm. 147064
Date 2/11/76

OWNER (Full Name) H Macindoe
PRESENT ADDRESS 19 Westbourne Rd Remuera PHONE 501.478
BUILDER: NAME J A Jacob
ADDRESS 14 Belmont Tce PHONE 546.765
Designer: T Hitchcock PHONE 378 316
Designing Engineer: PHONE

I. PARTICULARS OF LAND:
(a) Valuation No.
(b) Lot No. 4 DP 54105
(c) Deposited Plan No. 54105
(d) Street Main Rd Maraetai

II. PARTICULARS OF BUILDING
(a) Area of Basement
(b) Area of Ground Floor
(c) Area of Floor
(d) Area of Outbuildings 57
(e) Total Floor Area

III. ESTIMATED VALUE
(a) Building 3,000
(b) Sanitary Plumbing
(c) Drainage
Total $3,000

IV. NATURE OF PERMIT (Tick Box)
New building including separate buildings added to existing complex ✓
Repairs, alterations or extensions to an existing building
Conversion / Demolition

V. Purposes for which every part of proposed Building is to be used or occupied: e.g. Dwelling/Garage/Factory/Shop, etc
Garage

NOTE: PLEASE REFER TO REVERSE SIDE OF THIS FORM BEFORE SIGNING.

DATED this 11 day of Oct 1976

Signature of Applicant

FEES PAYABLE — FOR OFFICE USE ONLY

Plumbing/Drainage $ Rec. No. Date
Street Damage Deposit $ 50.00 Rec. No. 57.. Date
Building $ 15.40 Rec. No. Date
Water Connection $ Rec. No. Date
Crossing $ Rec. No. Date
Building Research Levy $ Rec. No. Date
Total $66.40

Fees Rec. $ 66.40 By: From: W. Jacobs

ENDORSE PERMIT YES NO

CITY OF MANUKAU

Application For Building Permit

Permit No. H47229
Ward:
Date Issued: 4/11/76

OWNER: (Full Name) HARLEY LISMAN GRAHAM MACINDOE
PRESENT ADDRESS 19 WESTBOURNE ROAD REMUERA PHONE 501478
BUILDER: NAME JAMES DAVERN LTD
ADDRESS 50-52 ... STREET NEW LYNN PHONE 875649
Designer: TREVOR FARLEY PHONE 875310
Designing Engineer: PHONE

I. PARTICULARS OF LAND:
(a) Valuation No. 3870/14764
(b) Lot No. 4
(c) Deposited Plan No. 54105
(d) Street Main Rd Maraetai

II. PARTICULARS OF BUILDING:
(a) Area of Basement
(b) Area of Ground Floor 145.85 m²
(c) Area of 1st Floor 21.76 m²
(d) Area of Outbuildings
(e) Total Floor Area

III. ESTIMATED VALUE:
(a) Building 18000-00
(b) Sanitary Plumbing 2000-00
(c) Drainage 700-00
Total 20,700-00

IV. NATURE OF PERMIT (Tick Box)
New building including separate buildings added to existing complex
Repairs, alterations or extensions to an existing building ✓
Conversion / Demolition

V. Purposes for which every part of proposed Building is to be used or occupied: e.g. Dwelling/Garage/Factory/Shop, etc.
DWELLING

NOTE: PLEASE REFER TO REVERSE SIDE OF THIS FORM BEFORE SIGNING.

DATED this 12 day of OCTOBER 1976

Signature of Applicant

FEES PAYABLE — FOR OFFICE USE ONLY

Plumbing/Drainage $ Rec. No. Date
Street Damage Deposit (8309) $100.00 Rec. No. 57995 Date 4.11.76
Building $ 57.20 Rec. No. 57996 Date
Water Connection $ Rec. No. Date
Crossing $ Rec. No. Date
Building Research Levy $ 10.50 Rec. No. 57997 Date
Total $167.70

Fees Rec. $ 567.70 By: MEN From: H.L.G. Macindoe

Agreement $400 — Rec. 57998 4/11/76 — $567.70

ENDORSE PERMIT YES NO

AUCKLAND CITY COUNCIL

Department of Works

Our ref: 50/257 25 August 1976

Mr J.F. Macindoe,
19 Westbourne Road,
Remuera,
AUCKLAND 5.

Dear Sir/Madam,

CERTIFICATE OF INSPECTION OF BUILDING
THE TERMITES ACT, 1940

The Auckland City Council, being a local authority to which the above-mentioned act applies, hereby certifies that an Inspector of Termites inspected the building described in the Schedule hereto on 19 August 1976 and that such inspection failed to disclose that there were termites in such building at the time of inspection.

SCHEDULE:

Two storey wood dwelling comprising 25 rooms approximately, detached cottage, garage and tennis pavilion, situated on Lot 1, D.P. 55122, C.T. 397/195.

19 Westbourne Road, Remuera, Auckland 5.

Note: In Section 2(1) of the Termites Act, 1940, Termites are defined as "Any species of Termites not indigenous to New Zealand". This certificate does not cover any native species of Termite or any other wood-boring insects.

Yours faithfully,

R.R. Lowe.

TERMITE INSPECTOR

MANUKAU CITY COUNCIL

BUILDING SECTION 20 SEPTEMBER 1972

REMOVAL AND RE-ERECTION SECOND HAND BUILDING

To The City Inspector
Manukau City Council
Private Bag
MANUREWA

I hereby apply for approval to the removal and re-erection of the following "secondhand" building.

TYPE OF BUILDING DWELLING
PRESENT OWNER H.L.G. MACINDOE
PRESENT LOCATION (STREET NO.) 19 (STREET) WESTBOURNE ROAD
LOCALITY REMUERA
PROPOSED SITE LOT 4 D.P. 54105
STREET MAIN ROAD MARAETAI. R.D. HOWICK.
PROPOSED USE DWELLING
APPLICANT'S SIGNATURE
PRESENT ADDRESS 19 WESTBOURNE RD. REMUERA PHONE 501478
BUILDER JAMES DAVERN LTD. PHONE 875649

In support of my application I submit the following details as specified in the information sheet supplied with this form.

Building Permit Application Form ✓
3 Site and Drainage Plans ✓
2 Floor Plans ✓
2 Subfloor Plans ✓
1 Footpath Crossing Form ✓
~~1 Water Application Form~~ N.A.
Termite Clearance Form ACC ✓
Age of Building 60 YEARS
Photos of 4 Sides of Dwelling and Where Keys are

Inspection Fee $ 5.00 Rec. No. 51685 Date 4/11/76
Mileage Charge $ ~~3.00~~ 1.60 (8@20c) Paid by H.L.G. Macindoe
Total $ ~~8.00~~ 6.60 Received by

1464 B ✓ 356

CITY OF MANUKAU

DATE RECEIVED 11/10/76 DATE RETURNED

ESTIMATED VALUE $3000.00

APPLICATION for BUILDING PERMIT

OWNER OF PROPERTY MACINDOE

Lot No. 4 D.P. 54105

WHITFORD-MARAETAI DRIVE ~~MARAETAI~~ MAIN WARD PAKURANGA

FOR OFFICE USE ONLY

Please Refer to [5][ ][ ] For Action

T.P. Rural area

Notified for Plumber 26/10/76

MANUKAU CITY COUNCIL			
	APPROVED FOR PERMIT	INITIALS	DATE
1	Building By-Laws		18/10/76
2	Plumbing Drainage		18/10/76
3	Health		
4	Structural Engineer		
5	Town Planning		13.10.77
6	Egress		
7	Dangerous Goods		
8	Drainage Engineer		

REFER TO BACK OF FORM FOR ENDORSEMENTS OR COMMENTS

CITY OF MANUKAU

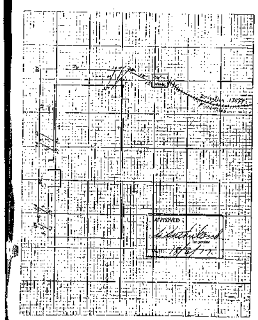
DRAINAGE PLAN

LOT 4 D.P. 54105 STREET: Whitford ~~Main~~ Maraetai Rd. RD Howick

OWNER: MR. H.L.G. MACINDOE

DRAINLAYER: A. CHRISTINI SCALE: 1:200

PLAN ... SHOWING STREET, SECTION, BOUNDARIES, OUTLINE OF BUILDINGS, ... OF DRAINS, INSPECTION FITTINGS, MUST BE SUPPLIED.



APPROVED ... Inspector 18/3/77

CITY OF MANUKAU

APPLICATION FOR PERMIT TO HAVE PLUMBING OR DRAINAGE WORK CARRIED OUT

To the City Inspector,
Manukau City Council,
Private Bag
MANUREWA.

RECEIVED -3 MAR 1977 CENTRAL REGISTRY

FOR OFFICE USE ONLY
PERMIT Plumbing No. 8204
Drainage No.
Date 3/3/77

I, Raymond John Blair of 46 ... Cres, Howick Plumber (Full Name) (Address and Occupation)

(the undersigned) hereby make application for permission to have the work described herein, and set out in the plans attached hereto, carried out on the under-mentioned premises for the person named hereunder.

(1) Name and address of Owner of premises where work is to be carried out:
H.L.G. Macindoe

(2) Description of Premises on which work is to be carried out: Lot No. 4
D.P. No. 54105 Street Main Maraetai Rd Howick
New or Existing Dwelling: Old house moved to site

(3) Description of proposed work:
(a) No. of Water Closets 3 (b) No. of Baths 2 (c) No. of Basins 3
(d) No. of Sinks 1 (e) No. of Showers ... (f) No. of Wash tubs 1
(g) No. of Urinals ... (h) No. of Separate Shower Compartments 2
(i) No. of Clothes Washing Machines ... (j) No. of Dish Washing Machines 1
(k) No. of Waste disposal Units ... (l) Other Sanitary Fittings (specify)

(m) All associated plumbing work in connection with the above.
(n) If in connection with existing work, give full details of repairs and alterations etc.
(o) Drainage Work to be entered (and state whether septic tank or grease trap is to be installed and give details of any disposal of waste water and effluent in accordance with attached plans).

(4) Estimated value of proposed work, including materials and fittings — Dollars
(a) Estimated Value of Plumbing Work 1600 55.00
(b) Estimated Value of Drainage Work

Plumber R.J. Blair Address 46 ... Cres, Howick
Reg. No. 5308 Reg. Auth. Lic. No.
DATED this 1st day of March 1977

Signature of Applicant

FOR OFFICE USE ONLY
WARD
Road Whitford Maraetai
Date Received 2.3.77
Approved
Remarks

Plumbing/Drainage Fee $ 35.00 Receipt No.
Sanitary Sewer Connection Fee $ Receipt No.
Stormwater Sewer Connection Fee $ Receipt No.
Date

✓

CITY OF MANUKAU

APPLICATION FOR PERMIT TO HAVE PLUMBING OR DRAINAGE WORK CARRIED OUT

To the City Inspector,
Manukau City Council,
Private Bag,
MANUREWA.

FOR OFFICE USE ONLY
PERMIT Plumbing No.
Drainage No. 8299
Date 21/3/77

I, A. Christini of 196 ... Rd, Howick (Full Name) (Address and Occupation)

(the undersigned) hereby make application for permission to have the work described herein, and set out in the plans attached hereto, carried out on the under-mentioned premises for the person named hereunder.

(1) Name and address of Owner of premises where work is to be carried out:
H.L.G. Macindoe

(2) Description of Premises on which work is to be carried out: Lot No. 4
D.P. No. 54105 Street Main Maraetai Rd
New or Existing Dwelling: Existing ... site

(3) Description of proposed work:
(a) No. of Water Closets (b) No. of Baths (c) No. of Basins
(d) No. of Sinks (e) No. of Showers (f) No. of Wash tubs
(g) No. of Urinals (h) No. of Separate Shower Compartments
(i) No. of Clothes Washing Machines (j) No. of Dish Washing Machines
(k) No. of Waste disposal Units (l) Other Sanitary Fittings (specify)

(m) All associated plumbing work in connection with the above.
(n) If in connection with existing work, give full details of repairs and alterations etc.
(o) Drainage Work to be entered ...
Complete drainage after tank

(4) Estimated value of proposed work, including materials and fittings — Dollars
(a) Estimated Value of Plumbing Work
(b) Estimated Value of Drainage Work 1000-00

Tradesman A. Christini Address 196 ... Rd, Howick
Reg. No. Reg. Auth. Lic. No. 2593
DATED this 1st day of March 1977

Signature of Applicant

FOR OFFICE USE ONLY
WARD
Road ~~...~~ Whitford Maraetai
Date Received
Approved
Remarks

Plumbing/Drainage Fee Receipt No. 76334 $ 26.00
Sanitary Sewer Connection Fee $ Receipt No.
Stormwater Sewer Connection Fee $ Receipt No.
Date 15/3/77

✓

BAG NO 595	DATE REC. 12/10/76
LOT NO 4	
OWNER MACINDOE	DP 54105
STREET ~~MAIN RD~~ MARAETAI WARD PAK	
BUILDER J. DAVERN	
TYPE OF BUILDING DWELL S'HAND	
PERMIT NO H47229	DATE ISSUED 4/11/76
BUILDING COMPLETED (signed)	

B

Whitford - Maraetai STREET	LOT 4
H L G Macindoe OWNER	DP 54105
... BUILDER	
PLUMBER RJ Blair	PERMIT NO. 8204
INSPECTED	
... completion ...	

a

DRAINLAYER A Christini	PERMIT NO. 8299
INSPECTED	
PTO Final drainage ...	

BAG NO 356	DATE REC. 12/10/76
LOT NO 4	
OWNER ~~Mac~~ MACINDOE	DP 54105
STREET MARAETAI MAIN RD WARD	
BUILDER JACOB	
TYPE OF BUILDING GARAGE	
PERMIT NO H47...	DATE ISSUED
BUILDING COMPLETED (signed)	

MICRO RECORD BUREAU

1986

55700/476/04

APPLICATION FOR LAND USE CONSENT

TO MAKE, ALTER, OR INSTALL A BORE

Page 1 of 4
27-4-1998

Auckland Regional Council

Fax To: C/R 267 8100.
Drillwell 20212-21412 CS12-12-2188

To: The General Manager, Environment
Auckland Regional Council
Private Bag 92 012
AUCKLAND

Fax (09) 366 2155

RECEIVED
04 APR 1998
May
Auckland Regional Council

For Office Use Only	3/97
Consent No.:	
Fee: $	

Pursuant to Section 88 of the Resource Management Act. 1991, the undersigned hereby applies for a permit, in accordance with the details below:-

Please read information on the accompanying sheet before filling in this form.
All units should be in metric.

PERMIT ISSUED
21412

PART A

1. Applicant details -

X a. Full name(s) or Company name of Applicant(s): ARTHUR SYLVAN MORGENSTERN

X b. Postal Address: 712 WHITFORD MARITEA ROAD RD 1 HOWICK

X c. Telephone Number: (Business): 093663001 (Private): 09 5366023

Fax Number: 09 5366374.

X d. Name of Contact Person: ARTHUR OR TANYA.

2. Details of driller or person carrying out works -

a. Full name(s) or company name: DRILLWELL EXPLORATION N.Z. LTD
P.O. BOX 360, MANUREWA
NEW ZEALAND

b. Postal Address: _____

c. Telephone Number: (09) 267 9100 Fax Number: (09) 267 8100

3. If site of works is not owned or occupied by applicant, please indicate:

X a. Full and postal address of owner: OWNED BY APPLICAND.
N A

X b. Telephone number: (business) N A (private) NA.

4. List any other consents required in relation to this proposal (e.g. water permit, land use consent, subdivision consent); and indicate whether or not they have been applied for:

_____

5. X Are there any previous or existing consents related to this proposal Yes ___ No X

..... If yes, give reference number(s) and description:

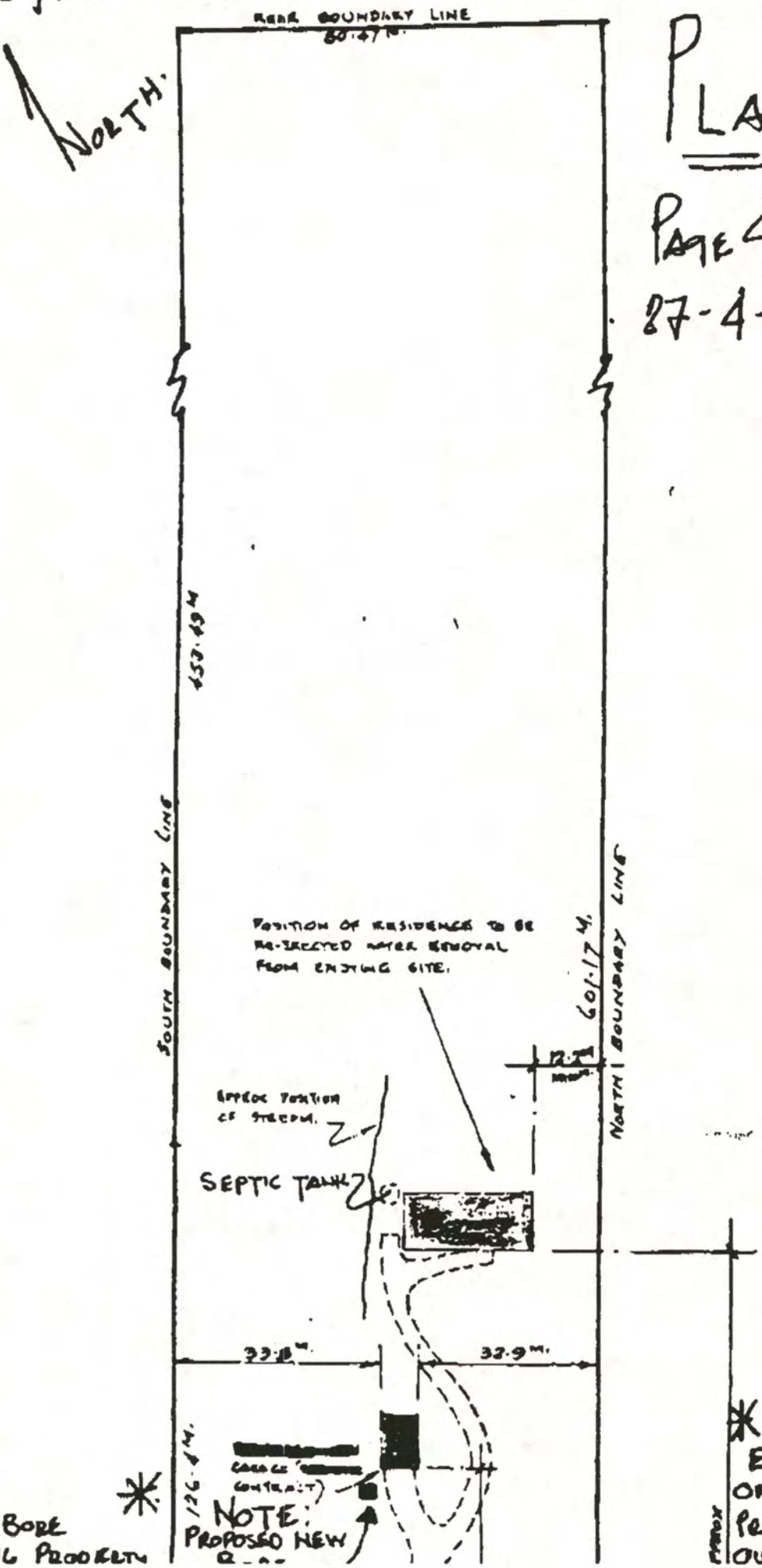
_____

MORGENSTERN BORE PERMIT APPLICATION SITE

PLAN.

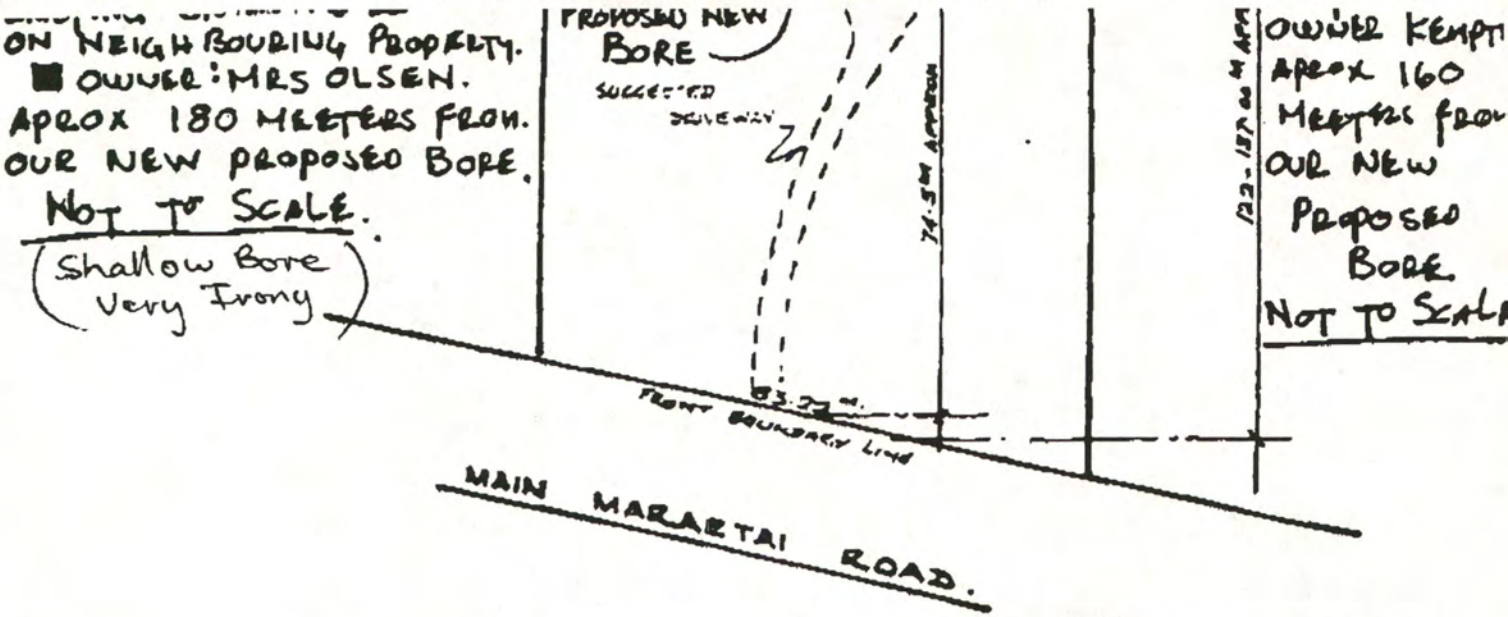
PAGE 4 OF 4.

27-4-1998.



* NOTE: EXISTING SHALLOW BORE ON NEIGHBOURING PROPERTY

* NOTE. EXISTING ON NEIGHBO PROPERTY. OWNER KNO



712 WHITFORD MARAETAI ROAD.

SITE & LOCATION PLAN

SCALE:- 1:1000

DRILLWELL EXPLORATION N.Z. LIMITED

9 Rawson Way
Takanini
AUCKLAND

DRILLING CONTRACTORS

21412

DAILY LOG SHEET

LOG No. 26930

P.O. BOX 360 MANUREW

Day: Tuesday Date: 21 . 5 . 98.

Client: A.S Morgenstern

Rig No: 3.

Consultant/Engineer:

Tender Truck No: 27

Location: 712 Whitford - Maraitai, Rd.

Compressor No: —

Purpose of Bore: Water!

Bore Hole No: 1

Bore Size: 100mm. Map Reference No: R11 892-755

Permit No: C512-12-2188

Work Details:

Arrived on site 10.00. Cleared site. Moved in rig & set up mast & drill-pit. Began to drill 6" hole to 63m. Flushed hole clean. Pulled out rods. Cleaned out drill pit. ~~Closed work~~ 5.30.

GROUNDWATER A.R.W.B.
W.R. No .....
NAME .....
TECHNICAL FILES
/ / .....
BORE LOG ACTIONED ✓
PUMP TEST .....
COMPUTER ✓
WATER QUAL .....

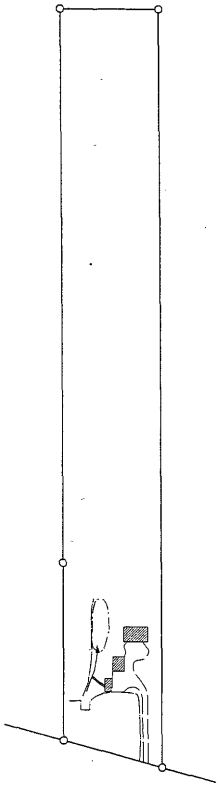
ON GTGS

WATER BOARD COPY

RC 20212

Bore Log:

0 - 3m Clay.
3m - 48m Waitamata Sand stone.
48 - 130 Waitamata S/S & Mudstone layers
130 - 135 Greywacke - Papakura limestone.
135 - 171.8 Hard Greywack.



SCALE 1:3000

LEGAL DESCRIPTION

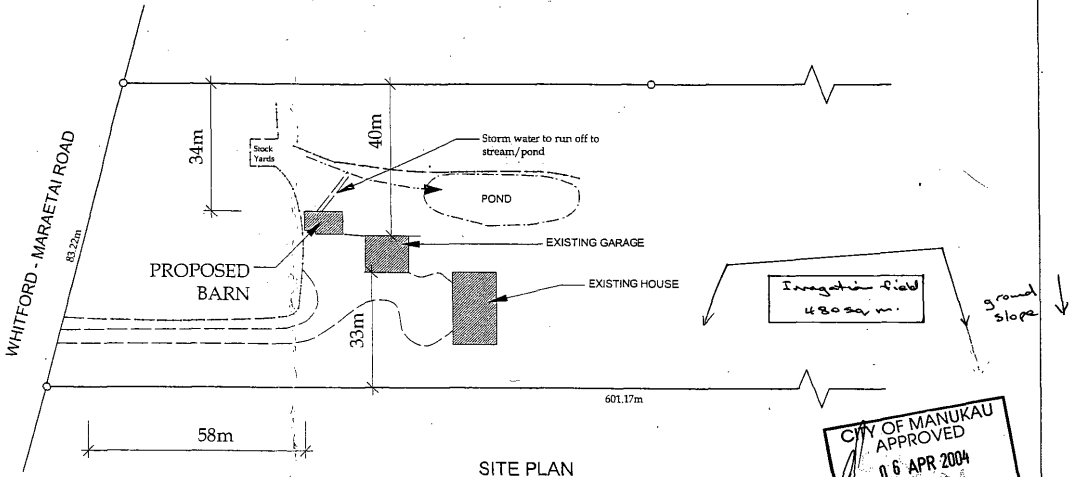
SITE ADDRESS:	Whitford - Maraetai Road RD1 Howick
LOT No.:	4
D.P.:	54105

PROPOSED BARN AREA: 58.6m²

NOTE

All boundary dimensions, site size & public drainage ascertained from developers preliminary information. All final sizes, dimensions & drainage requirements are to be confirmed prior to commencement of any on site construction.

041229P3



SITE PLAN

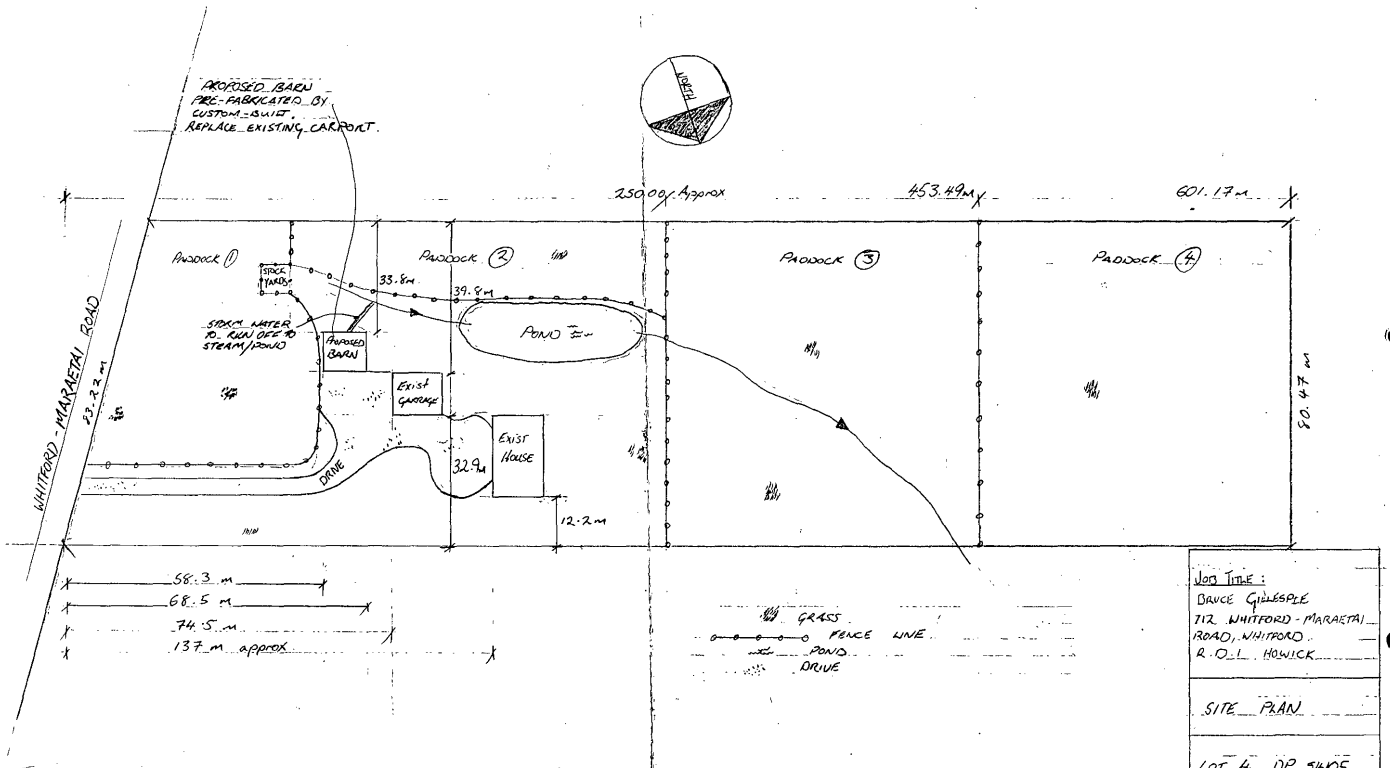
SCALE 1:1000

CITY OF MANUKAU
APPROVED
06 APR 2004
BUILDING OFFICIAL

DATE:	Feb 2004	Sheet: 1 of 4
REF:	CB 545	
CLIENT:	Bruce Gillespie	
SITE:	712 Whitford Maraetai Rd Whitford	Drawn by: JY

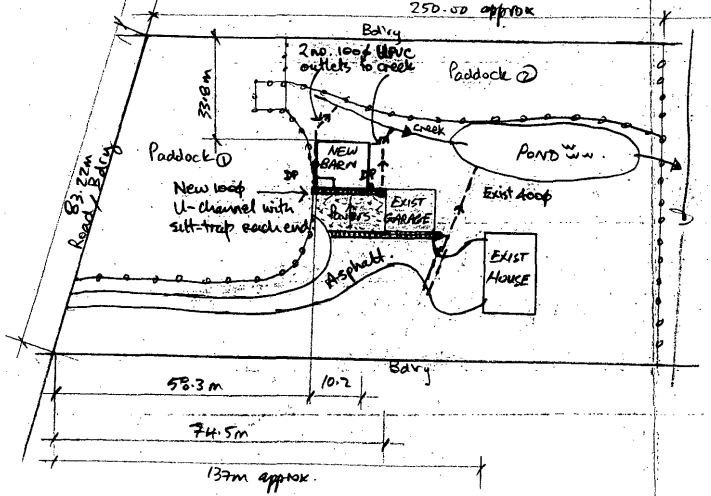
Ph 09 238 6518 Fax 09 238 5620 29a Pukekohe East Rd, Pukekohe
Email customkit@clear.net.nz Web www.customkit.co.nz

CUSTOMKIT BUILDINGS

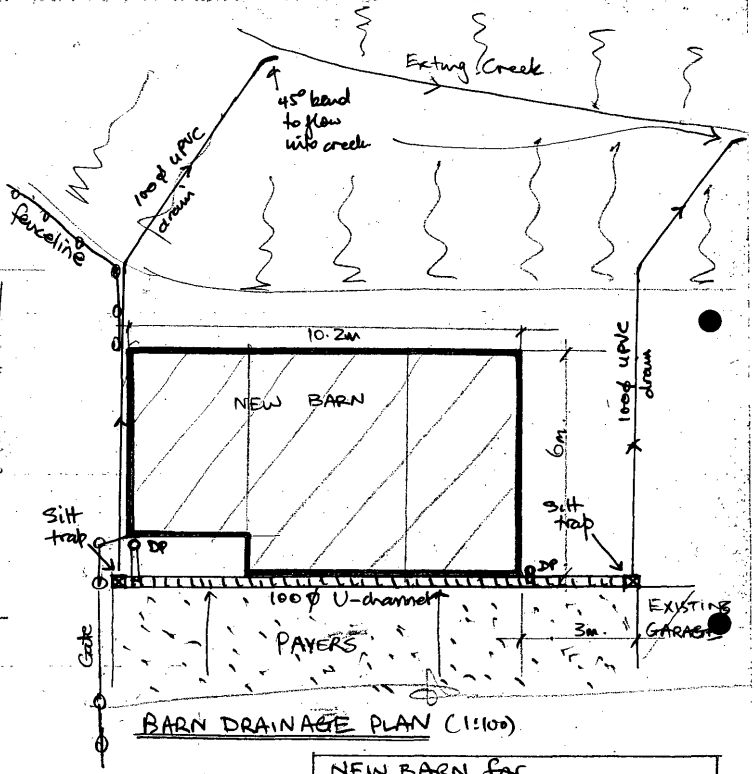


12 Ron Avenue
please fit
E Tamaki.

650282



SITE PART PLAN (1:1000 approx)



BARN DRAINAGE PLAN (1:100)

Bruce James GILLESPIE
BSc, BE, FIPENZ, FHKIE, FIStructE, CEng, REng
Registered Structural Engineer
(RSE 46/83)

NEW BARN for B. J. GILLESPIE
712 WHITFORD-MARAETAI RD. WHITFORD, RD1 HOWICK
LOT 4 DP 54105 DD 9347/712
ASBUILT DRAINAGE PLAN. (Scale approx 1:1000, 1:100)

Te Kaunihera o
MANUKAU
City Council

PLEASE NOTE

BCN-001
Issue 14

DC 72

APPLICATION FOR BUILDING CONSENT

Section 33, Building Act 1991
Cross each applicable box and attach all relevant documents in triplicate, or duplicate if not completing Part B of this form]

APPLICATION No: 04/1229 **TEMP BAG No:** B1A285.

Correspondence:
Private Bag
Manukau City
New Zealand
Telephone: (09) 263 7100
Facsimile: (09) 262 5154
DX EP 75557

PART A: GENERAL
[Complete Part A in all cases]

1 OWNER

Name*: Bruce Gillespie
Postal Address: 712 Whitford-Maraetai Rd, Whitford, Howick R.D.1.
Phone No: _____ Fax No _____
E-mail: _____

2 CONTACT (if not owner)

Contact Name: James Gordon Hogg
Postal Address: 712 Whitford Maraetai Rd, Whitford, Howick R.D.1.
Phone No: 5365312 Fax No 536 5318
E-mail: james.hogg@extra.co.nz.

3 PROJECT LOCATION

Address: 712 Whitford Maraetai Rd.

4 LEGAL DESCRIPTION

Valuation Number:	
Zoning	Cadastral

Property ID:	Holding No:
Ward:	
Lot(s): 4	DP(s): 54105
Area(s): ..... Square metres ..... hectares	

5. SCANNING FEES

A4 pages ☐ A3 pages ☐ A2 pages ☐

6. PROJECT

6.1		6.2
New building	☐	Intended life:
Alteration	☐	Indefinite but not less than 50 years ☐
Relocation	☐	OR
Demolition	☐	Specified as ☐ years

6.3 **Description of Work** (in detail)

Building a barn.
+ New Septic tank system.

6.4 **Intended Use(s):** _____

Stage _____ of _____

6.5 **Estimated value of stage $** 70,000 (incl GST)

7. RESOURCE CONSENT

A resource consent associated with this application has been:
☐ granted (Resource Consent No _____)
☐ applied for (date of application _____)
☐ there is no resource consent for this work

8. CONFIDENTIALITY

Do you wish to have the details of your project kept confidential?
☐ Yes
☐ No
(See panel at back of application)

Signed by or for and on behalf of the owner:

Signature: _____

Name: James Gordon Hogg (PLEASE PRINT) Date: 23/8/04

*Under Section 33 of the Building Act 1991, the applicant must be owner of the land on which building work is contemplated or a person who or which has agreed in writing, whether conditionally or unconditionally, to purchase the land or any leasehold estate or interest in the land, or to take a lease of the land, while the agreement remains in force (or their lawful agent).

Onsite Wastewater System Maintenance Record (Secondary & Tertiary)

*Required fields

1. Property information

*Property address:
712 Whitford - Maraetai rd Howick

*Type of property:
Residential

*Are there multiple systems on this property? No

*Does this system have a resource consent? Unknown

Customer Name/ Reference Number: Gillespie, Bruce

2. Inspection details

*Service company: Hydrovac

*Service person: Johnnie

*Inspection date and time: 27/11/2020 08:58
Weather condition: Dry

Reason for inspection:
Routine inspection for secondary/tertiary system (6 monthly)

3. Treatment system

*Type of device:
Secondary

*Brand
Hynds

Model
Elite

4. General site inspection

*Is there noticeable sewage odour?	No
*Is there an insect infestation (i.e. flies, mosquitos)?	No
*Has owner reported issues with drainage within home?	No
*Are there any signs of effluent discharge off the property?	No

Number of tank chambers: 5

Water supply: Rain Tank

5. Treatment tanks

*Tank lids are sealed when arrived site?	Yes
Lid depth	300 mm
Wall condition	Good
Baffle condition	Good
Inlet condition	Good
Outlet condition	Good
*Working Tank Depth	1800 mm
*Estimated solid top (scum)	50 mm
*Estimated solid bottom (sludge)	50 mm
Level of sludge in aeration tank	

Vacuum clarifier functioning	Yes
Liquor quality	Good
Venturi Aerator functioning	Not applicable
Tank riser condition	Good
Floats condition	Good
Filter on blower cleaned or replaced	Cleaned
UV treatment	
Sand filers	
Textile filters	
Pump pressure	Good
*Tank lids are sealed when left site	Yes

*Signs of storm water/groundwater entering chamber	No
*Any visible cracks, root infiltration or other damage to tank	No
Air diffusers functioning (blowers/air diffuser/jets)	Yes
Meter reading	Kl

*Overall tank function: Good
If poor, issues identified:

Recommended further remedial actions:

6. Effluent filters

*Present Yes
Functioning Yes
If not functioning, issues identified:

Recommended further remedial actions:

7. Electrical components (i.e. alarm)

*Present Yes
Functioning Yes
If not functioning, issues identified:

Recommended further remedial actions:

8. Pump

*Present Yes
Functioning Yes
If not functioning, issues identified:

Recommended further remedial actions:

9. Irrigation Chamber

*Present Yes
Functioning Yes
If not functioning, issues identified:

Recommended further remedial actions:

10. Greywater

*Present No
Functioning
If not functioning, issues identified:

Recommended further remedial actions:

10.* Disposal field

Pressure Compensating Drip Irrigation

*Ponding around the disposal field	No
Signs of breakout downstream of disposal field	No
*Signs of effluent discharge off the property	No
*Evidence of overland flow paths through disposal field	No
Evidence of upslope cut-off drains around disposal field	No
*Evidence of soil distrubance or compaction in disposal field (construction, rubbish, dumping, machinery, stock damage)	No

Disposal field located within 15m of stream/river/wetland	No
Distribution pipes flushed with good pressure	Yes
Even effluent distribution	Yes
Distribution pipe systems follow contour of the land	Yes
All flush valves are clearly marked, protected, in good condition	Yes

*Overall disposal field function: Good

If poor, issues identified:

Recommended further remedial actions:

Notes

11. Photos and site sketch

12. Summary

Summary of issues identified during inspection which may prevent the onsite wastewater system functioning adequately.

List items	Functions	Issues identified
General site inspection	Good	
Treatment tanks	Good	
Effluent filters	Good	
Electrical components (i.e. alarm)	Good	
Pump	Good	
Irrigation Chamber	Good	
Greywater system	Not present	
Disposal field	Good	

13. Overall onsite wastewater system condition

*On this date, the system is performing adequately Yes

*Printed name: Johnnie *Date: 27/11/2020

Signature:

Notes

Decision on an application for resource consent under the Resource Management Act 1991

Discretionary activity

Application number:	LUC60384266
Applicant:	Peter Dawson – The Turning Point New Zealand Limited
Site address:	712 Whitford-Maraetai Road, Whitford
Legal description:	Lot 4 DP 54105

Proposal:

The proposal is for the change of use of the existing building on the site, from residential to a detoxification and rehabilitation facility, defined as a healthcare activity, for people recovering from substance abuse, with an infringement to the minimum car parking space requirement and use of the existing vehicle crossing which is subject to a vehicle access restriction.

Resource consent is required for the following reasons:

Land use consent (s9) – LUC60384266

Auckland Unitary Plan (Operative in part)

I441 Whitford Precinct

- **Discretionary Activity** for the existing dwelling and outbuildings being located on a site where the Record of Title does not have an attached consent specifying a building platform area pursuant to Standard I441.6.4(3).

H19 Rural Zones – Rural Countryside Living Zone

- **Discretionary Activity** under Activity Table H19.8.1(A47) for the change in land use activity of the existing building on the site from residential to a healthcare activity.

E27 Transport

- **Restricted Discretionary Activity** under Activity Table E27.4.1(A5) for the use of an existing vehicle crossing where a vehicle access restriction applies since it has a frontage to an arterial road (Whitford-Maraetai Road) as prescribed under Standard E27.6.4.1(3)(c).
- **Restricted Discretionary Activity** under Activity Table E27.4.1(A2) where the proposal involves accessory parking and access that does not meet the following parking and access standards:

Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.

Delegated decision maker:

Name: Robert Chieng

Title: Team Leader, Resource Consents

Signed: 

Date: 30 September 2021

Appendix E: Site contamination enquiry

9 December 2021

Tonkin & Taylor
105 Carlton Gore Road
AUCKLAND 1023

Site Contamination Enquiry – *712 Whitford-Maraetai Road, Whitford*

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

There is no contamination information held within Council's records for 712 Whitford-Maraetai Road, Whitford

Due to the age of the dwelling on site the potential for asbestos and/or lead paint may need to be considered.

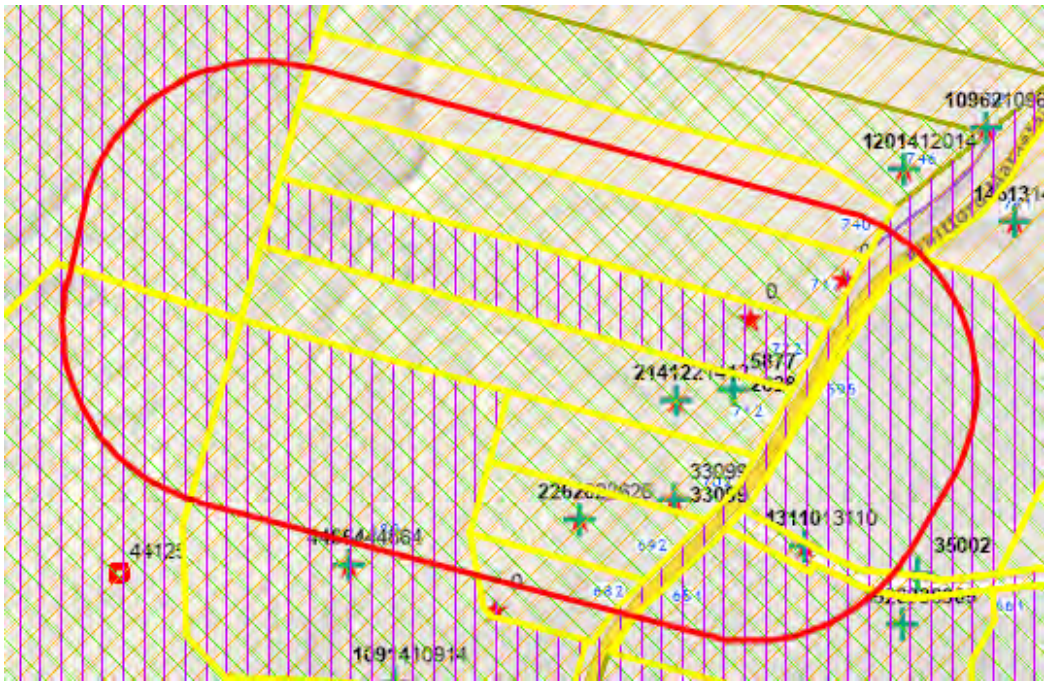
Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities



Legend:

All Consents
All Applications
All Permitted Activities
All Bores
Closed Landfill (Auckland Council owned)
Closed Landfill (Privately owned)

Relevant details of any pollution incidents and consents are appended to this letter (Attachment A). Please refer to the column titled ‘Property Address’ on the spreadsheet to aid in identifying corresponding data on the map.

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any

financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for $128 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council

Appendix F: Summary Tables and Laboratory Analytical Results

Table F1 - Relative percentage differences

Sample ID	SS06	Duplicate 1	RPD%	HA11	Duplicate 2	RPD%	HA17	Duplicate 3	RPD%	HA06	Duplicate 4	RPD%	HA103 - 0.5	Dup1 - 0.5	RPD%	HA103A - 0.5	Dup2 - 0.5	RPD%
Sample Name / Guideline Values	SS06	SS06		HA11	HA11		HA17	HA17		HA06	HA06		HA103 - 0.5	Dup1 - 0.5		HA103A	Dup2 - 0.5	
Depth	0.00	0.00		0.00	0.00		0.00	0.00		0.50	0.50		0.5	0.5		0.5	0.5	
Strata	Topsoil	Topsoil		Topsoil	Topsoil		Topsoil	Topsoil		Fill	Fill		Clayey SILT	Clayey SILT		Clayey SILT	Clayey SILT	
Date	06/07/2021	06/07/2021		06/07/2021	06/07/2021		06/07/2021	06/07/2021		06/07/2021	06/07/2021		23-Nov-21	23-Nov-21		23-Nov-21	23-Nov-21	
Metals																		
Arsenic	2	5	86	4	5	22	3	3	0	5	5	0	5	5	0	4	3	29
Cadmium	0.15	< 0.10	<LOR	0.23	0.21	9	0.13	0.1	26	< 0.10	< 0.10	<LOR	< 0.10	< 0.10	<LOR	< 0.10	< 0.10	<LOR
Chromium	11	14	24	12	13	8	10	10	0	15	14	7	13	15	14	20	14	35
Copper	5	9	57	5	5	0	23	16	36	10	9	11	9	10	11	12	10	18
Lead	8.5	6.7	24	8.9	8.9	0	17.1	15.1	12	7.1	6.7	6	6.4	7.4	14	6.9	6.7	3
Nickel	4	9	77	14	13	7	9	6	40	14	12	15	10	13	26	17	11	43
Zinc	16	28	55	30	32	6	51	40	24	30	27	11	24	32	29	37	28	28
Organochlorine Pesticides																		
2,4'-DDD	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
2,4'DDE	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
2,4'-DDT	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
4,4'-DDD	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
4,4'-DDE	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
4,4'-DDT	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Aldrin	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Alpha-BHC	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Beta-BHC	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
cis-Chlordane	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Delta-BHC	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Dieldrin	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endosulfan I	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endosulfan II	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endosulfan sulphate	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endrin	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endrin aldehyde	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Endrin ketone	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Gamma-BHC (Lindane)	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Heptachlor	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Heptachlor epoxide	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Hexachlorobenzene	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Methoxychlor	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Total DDT Isomers	< 0.08	< 0.08	<LOR	-	-	NA	-	-	NA	< 0.08	< 0.08	<LOR	< 0.08	-	<LOR	-	-	<LOR
trans-Chlordane	< 0.014	< 0.013	<LOR	-	-	NA	-	-	NA	< 0.013	< 0.013	<LOR	< 0.013	-	<LOR	-	-	<LOR
Polycyclic Aromatic Hydrocarbons																		
1-Methylnaphthalene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.3	< 0.3	<LOR	< 0.3	< 0.3	<LOR
2-Methylnaphthalene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Acenaphthene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Acenaphthylene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Anthracene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
BaP equivalent	-	-	NA	< 0.04	< 0.03	<LOR	< 0.03	< 0.03	<LOR	< 0.03	< 0.03	<LOR			<LOR			<LOR
Benzo (e) pyrene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Benzo[a]anthracene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Benzo[a]pyrene (BAP)	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Benzo[g,h,i]perylene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Benzo[k]fluoranthene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Chrysene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Dibenzo[a,h]anthracene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Fluoranthene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Fluorene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Indeno(1,2,3-c,d)pyrene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Naphthalene	-	-	NA	< 0.07	< 0.07	<LOR	< 0.06	< 0.06	<LOR	< 0.07	< 0.07	<LOR	< 0.07	< 0.07	<LOR	< 0.07	< 0.07	<LOR
Perylene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	0.017	0.022	26	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Phenanthrene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR
Pyrene	-	-	NA	< 0.013	< 0.013	<LOR	< 0.012	< 0.012	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR	< 0.013	< 0.013	<LOR

Notes:

All values in mg/kg unless otherwise indicated (i.e. asbestos).

'-' indicates not analysed or no relevant acceptance criteria

<LOR = less than laboratory limit of reporting

Grey font indicates values <LOR

Table F2 - Analytical Results

Sample ID										PT-BL_HA01_0.00m-0.15m	PT-BL_HA02_0.00m-0.10m	PT-BL_HA03_0.40m-0.65m	PT-BL_HA04_0.00m-0.10m	PT-BL_HA05_0.00m-0.15m	PT-BL_HA06_0.00m-0.10m	PT-BL_HA06_0.50m-0.60m	PT-BL_HA07_0.00m-0.10m	PT-BL_HA08_0.50m-0.60m
Sample Name / Guideline Values	NES Commercial / Industrial[1a]	NES Recreational[1b]	NES High Density Residential[1c]	NES Residential (10 % produce)[1d]	NES Rural Residential / lifestyle block (25% produce)[1e]	AUP Permitted Activity Criteria[2]	Published Auckland Background Levels (volcanic)[3b]	Typical Managed Fill Criteria*	Maximum	HA01	HA02	HA03	HA04	HA05	HA06	HA06	HA07	HA08
Depth										0.00	0.00	0.40	0.00	0.00	0.00	0.50	0.00	0.50
Strata										Topsoil	Topsoil	Fill	Topsoil	Topsoil	Topsoil	Fill	Topsoil	Fill
Date										06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Asbestos (Semi-Quantitative)																		
Asbestos type	-		-	-	-	-	ND	At operator discretion	-	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	-	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Asbestos form	-		-	-	-	-	ND	At operator discretion	-	-	-	-	-	-	-	-	-	-
Asbestos as ACM (w/w%)	0.05%*	0.02%*	0.04%*	0.01%*	0.01%*	-	ND	At operator discretion		-	-	-	-	-	-	-	-	-
Asbestos Fibres/Fine (w/w %)	0.001%*	0.001%*	0.001%*	0.001%*	0.001%*	-	ND	At operator discretion		-	-	-	-	-	-	-	-	-
Metals																		
Arsenic	70	80	45	20	17	100	12	70	35	-	-	-	-	-	-	5	6	4
Cadmium	1300	400	230	3	0.8	7.5	0.65	7.5	0.23	-	-	-	-	-	-	< 0.10	0.14	0.12
Chromium	6300	2700	1500	460	290	400	55	400	34	-	-	-	-	-	-	15	12	12
Copper	>10000	>10000	>10000	>10000	>10000	325	45	325	31	-	-	-	-	-	-	10	22	15
Lead	3300	880	500	210	160	250	65	250	17.1	-	-	-	-	-	-	7.1	15.4	13.9
Nickel	6000[5]	1200[5]	1200[5]	400[5]	-	105	35	320	19	-	-	-	-	-	-	14	14	9
Zinc	400000[7]	30000[7]	60000[7]	7400[7]	-	400	180	400	77	-	-	-	-	-	-	30	71	76
Organochlorine Pesticides																		
2,4'-DDD	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
2,4'DDE	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
2,4'-DDT	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
4,4'-DDD	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
4,4'-DDE	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
4,4'-DDT	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Aldrin	160	70	45	2.6	1.1	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Alpha-BHC	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Beta-BHC	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
cis-Chlordane	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Delta-BHC	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Dieldrin	160	70	45	2.6	1.1	2.7[10]	<LoR	0.2	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endosulfan I	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endosulfan II	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endosulfan sulphate	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endrin	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endrin aldehyde	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Endrin ketone	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Gamma-BHC (Lindane)	14000[10]	1400[10]	700[10]	139[10]	33[10]	140[10]	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Heptachlor	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Heptachlor epoxide	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Hexachlorobenzene	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Methoxychlor	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Total DDT Isomers	1000	400	240	70	45	12	<LoR	12	<LoR	-	-	-	-	-	< 0.08	< 0.08	< 0.08	-
trans-Chlordane	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	< 0.013	< 0.013	< 0.013	-
Polycyclic Aromatic Hydrocarbons																		
1-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
2-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Acenaphthene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Acenaphthylene	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
BaP equivalent	35	40	24	10	6	20	<LoR	20	0.03	-	-	-	-	-	-	< 0.03	< 0.03	< 0.03
Benzo (e) pyrene	-	-	-	-	-	-	<LoR	-	0.016	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Benzo[a]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.025	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Benzo[a]pyrene (BAP)	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.017	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Benzo[b]fluoranthene + Benzo[j]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.029	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Benzo[g,h,i]perylene	-	-	-	-	-	-	<LoR	-	0.012	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Benzo[k]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.011	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Chrysene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.018	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Dibenzo[a,h]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.031	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Fluorene	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Indeno(1,2,3-c,d)pyrene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	-	0.012	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Naphthalene	210[7]	63[7]	63[7]	63[7]	7.2[7]	0.28[8]	<LoR	-	<LoR	-	-	-	-	-	-	< 0.07	< 0.07	< 0.06
Perylene	-	-	-	-	-	-	<LoR	-	0.017	-	-	-	-	-	-	0.017	< 0.013	< 0.012
Phenanthrene	-	-	-	-	-	-	<LoR	-	<LoR	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012
Pyrene	NL[7]	1600[7]	1600[7]	1600[7]	160[7]	7.9[9]	<LoR	-	0.027	-	-	-	-	-	-	< 0.013	< 0.013	< 0.012

Notes:
All values in mg/kg unless otherwise indicated (i.e. asbestos).
'-' indicates not analysed or no relevant acceptance criteria
<LOR = less than laboratory limit of reporting
Grey font indicates values <LOR
'ND or Asbestos NOT detected' = asbestos not identified to be present by the laboratory method.
NL = Not limiting (i.e. >10,000 mg/kg)

Red values indicate that the results exceed NES Soil criteria: commercial / industrial criteria
▲ values indicate results exceed NES recreational criteria
Dashed outlined values indicate that the results exceed NES Soil criteria: High density residential criteria
Grey Shaded values indicate that the results exceed NES Soil criteria: Residential 10% produce criteria
Underlined values indicates that results exceed the AUP Permitted Activity Criteria
Bold values indicate that results exceed the published background concentrations for non-volcanic soils in the Auckland Region
● values indicate that results exceed typical managed fill criteria

1a - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Commercial/Industrial use (and adopted conservative preliminary screening standard for construction works), unless otherwise stated.
1b - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Recreational use, unless otherwise stated.
1c - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: High density residential use, unless otherwise stated.
1d - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Residential 10% produce, unless otherwise stated.
2 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).
3b - Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: non-volcanic soils
5 - Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.
6 - USPEA Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.
* Ridge Road acceptance criteria based on the published maximum truckload concentrations for deep fill (>2.0m).

Table F2 - Analytical Results

Sample ID								PT-BL_HA09_0.00m-0.10m	PT-BL_HA10_0.00m-0.10m	PT-BL_HA11_0.00m-0.10m	PT-BL_HA11_0.50m-0.60m	PT-BL_HA12_0.00m-0.10m	PT-BL_HA13_0.00m-0.10m	PT-BL_HA14_0.00m-0.20m	PT-BL_HA14_0.20m-0.60m	PT-BL_HA15_0.00m-0.05m	PT-BL_HA16_0.00m-0.10m
Sample Name / Guideline Values	NES Commercial / Industrial[1a]	NES Recreational[1b]	NES High Density Residential[1c]	NES Residential (10 % produce)[1d]	NES Rural Residential / lifestyle block (25% produce)[1e]	AUP Permitted Activity Criteria[2]	Published Auckland Background Levels (volcanic)[3b]	HA09	HA10	HA11	HA11	HA12	HA13	HA14	HA14	HA15	HA16
Depth								0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.20	0.00	0.00
Strata								Topsoil	Topsoil	Topsoil	Natural	Topsoil	Topsoil	Topsoil	Natural	Topsoil	Topsoil
Date								06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Asbestos (Semi-Quantitative)																	
Asbestos type	-		-	-	-	-	ND	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	-	Asbestos NOT detected.	-	Asbestos NOT detected.	-	Asbestos NOT detected.	Asbestos NOT detected.
Asbestos form	-		-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-
Asbestos as ACM (w/w%)	0.05%*	0.02%*	0.04%*	0.01%*	0.01%*	-	ND	-	-	-	-	-	-	-	-	-	-
Asbestos Fibres/Fine (w/w %)	0.001%*	0.001%*	0.001%*	0.001%*	0.001%*	-	ND	-	-	-	-	-	-	-	-	-	-
Metals																	
Arsenic	70	80	45	20	17	100	12	< 2	2	4	2	2	5	3	2	3	< 2
Cadmium	1300	400	230	3	0.8	7.5	0.65	0.11	< 0.10	0.23	< 0.10	< 0.10	0.22	0.19	< 0.10	< 0.10	0.17
Chromium	6300	2700	1500	460	290	400	55	9	13	12	10	12	16	22	34	30	11
Copper	>10000	>10000	>10000	>10000	>10000	325	45	4	5	5	7	5	8	6	10	7	4
Lead	3300	880	500	210	160	250	65	6.4	6.7	8.9	6.7	9.1	9.8	8.3	9.3	9.3	7.9
Nickel	6000[5]	1200[5]	1200[5]	400[5]	-	105	35	3	4	14	6	4	7	4	5	3	3
Zinc	400000[7]	30000[7]	60000[7]	7400[7]	-	400	180	11	8	30	14	13	20	16	22	14	10
Organochlorine Pesticides																	
2,4'-DDD	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
2,4'DDE	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
2,4'-DDT	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
4,4'-DDD	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
4,4'-DDE	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
4,4'-DDT	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Aldrin	160	70	45	2.6	1.1	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Alpha-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Beta-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
cis-Chlordane	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Delta-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Dieldrin	160	70	45	2.6	1.1	2.7[10]	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endosulfan I	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endosulfan II	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endosulfan sulphate	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endrin	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endrin aldehyde	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Endrin ketone	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Gamma-BHC (Lindane)	14000[10]	1400[10]	700[10]	139[10]	33[10]	140[10]	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Heptachlor	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Heptachlor epoxide	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Hexachlorobenzene	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Methoxychlor	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Total DDT Isomers	1000	400	240	70	45	12	<LoR	-	-	-	-	-	< 0.08	-	-	< 0.08	-
trans-Chlordane	-	-	-	-	-	-	<LoR	-	-	-	-	-	< 0.013	-	-	< 0.013	-
Polycyclic Aromatic Hydrocarbons																	
1-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
2-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Acenaphthene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Acenaphthylene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
BaP equivalent	35	40	24	10	6	20	<LoR	< 0.04	< 0.04	< 0.04	< 0.03	< 0.03	< 0.04	< 0.03	< 0.04	< 0.03	< 0.04
Benzo (e) pyrene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[a]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[a]pyrene (BAP)	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[b]fluoranthene + Benzo[j]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[g,h,i]perylene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[k]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Chrysene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Dibenzo[a,h]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Fluorene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Indeno(1,2,3-c,d)pyrene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Naphthalene	210[7]	63[7]	63[7]	63[7]	7.2[7]	0.28[8]	<LoR	< 0.07	< 0.07	< 0.07	< 0.06	< 0.06	< 0.07	< 0.07	< 0.08	< 0.07	< 0.07
Perylene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Phenanthrene	-	-	-	-	-	-	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Pyrene	NL[7]	1600[7]	1600[7]	1600[7]	160[7]	7.9*	<LoR	< 0.014	< 0.013	< 0.013	< 0.012	< 0.012	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013

Notes:

All values in mg/kg unless otherwise indicated (i.e. asbestos).

'-' indicates not analysed or no relevant acceptance criteria

<LOR = less than laboratory limit of reporting

Grey font indicates values <LOR

'ND or Asbestos NOT detected' = asbestos not identified to be present by the laboratory method.

NL = Not limiting (i.e. >10,000 mg/kg)

Red values indicate that the results exceed NES Soil criteria: commercial / industrial criteria

▲ values indicate results exceed NES recreational criteria

Dashed outlined values indicate that the results exceed NES Soil criteria: High density residential criteria

Grey Shaded values indicate that the results exceed NES Soil criteria: Residential 10% produce criteria

Underlined values indicates that results exceed the AUP Permitted Activity Criteria

Bold values indicate that results exceed the published background concentrations for non-volcanic soils in the Auckland Region

● values indicate that results exceed typical managed fill criteria

1a - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Commercial/Industrial use (and adopted conservative preliminary screening standard for construction works), unless otherwise

1b - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Recreational use, unless otherwise stated.

1c - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: High density residential use, unless otherwise stated.

1d - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Residential 10% produce, unless otherwise stated.

2 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).

3b - Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: non-volcanic soils

5 - Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.

6 - USPEA Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.

* Ridge Road acceptance criteria based on the published maximum truckload concentrations for deep fill (>2.0m).

Table F2 - Analytical Results

Sample ID								PT-BL_HA16_0.20m-0.60m	PT-BL_HA17_0.00m-0.10m	PT-BL_HA18_0.00m-0.10m	PT-BL_HA19_0.00m-0.30m	PT-BL_HA20_0.00m-0.30m	PT-BL_HA21_0.20m-0.60m	Beachlands (NE samples)_HA22_0.00m-0.10m	Beachlands (NE samples)_HA23_0.35m-0.60m
Sample Name / Guideline Values	NES Commercial / Industrial[1a]	NES Recreational[1b]	NES High Density Residential[1c]	NES Residential (10 % produce)[1d]	NES Rural Residential / lifestyle block (25% produce)[1e]	AUP Permitted Activity Criteria[2]	Published Auckland Background Levels (volcanic)[3b]	HA16	HA17	HA18	HA19	HA20	HA21	HA22	HA23
Depth								0.20	0.00	0.00	0.00	0.00	0.20	0.00	0.35
Strata								Natural	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Fill
Date								06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	09/07/2021	09/07/2021
Asbestos (Semi-Quantitative)															
Asbestos type	-		-	-	-	-	ND	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Asbestos form	-		-	-	-	-	ND	-	-	-	-	-	-	-	-
Asbestos as ACM (w/w%)	0.05%*	0.02%*	0.04%*	0.01%*	0.01%*	-	ND	-	-	-	-	-	-	-	-
Asbestos Fibres/Fine (w/w %)	0.001%*	0.001%*	0.001%*	0.001%*	0.001%*	-	ND	-	-	-	-	-	-	-	-
Metals															
Arsenic	70	80	45	20	17	100	12	< 2	3	3	2	< 2	< 2	5	2
Cadmium	1300	400	230	3	0.8	7.5	0.65	< 0.10	0.13	0.16	0.18	0.17	0.15	< 0.10	< 0.10
Chromium	6300	2700	1500	460	290	400	55	10	10	13	10	7	9	9	11
Copper	>10000	>10000	>10000	>10000	>10000	325	45	< 2	23	5	6	3	3	9	6
Lead	3300	880	500	210	160	250	65	5	17.1	11.4	10.3	6.1	6.5	7.4	6.8
Nickel	6000[5]	1200[5]	1200[5]	400[5]	-	105	35	3	9	3	3	2	3	6	8
Zinc	400000[7]	30000[7]	60000[7]	7400[7]	-	400	180	6	51	13	17	8	9	32	24
Organochlorine Pesticides															
2,4'-DDD	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
2,4'DDE	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
2,4'-DDT	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
4,4'-DDD	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
4,4'-DDE	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
4,4'-DDT	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Aldrin	160	70	45	2.6	1.1	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Alpha-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Beta-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
cis-Chlordane	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Delta-BHC	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Dieldrin	160	70	45	2.6	1.1	2.7[10]	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endosulfan I	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endosulfan II	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endosulfan sulphate	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endrin	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endrin aldehyde	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Endrin ketone	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Gamma-BHC (Lindane)	14000[10]	1400[10]	700[10]	139[10]	33[10]	140[10]	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Heptachlor	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Heptachlor epoxide	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Hexachlorobenzene	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Methoxychlor	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Total DDT Isomers	1000	400	240	70	45	12	<LoR	-	-	-	-	< 0.08	< 0.08	-	-
trans-Chlordane	-	-	-	-	-	-	<LoR	-	-	-	-	< 0.013	< 0.012	-	-
Polycyclic Aromatic Hydrocarbons															
1-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
2-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Acenaphthene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Acenaphthylene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
BaP equivalent	35	40	24	10	6	20	<LoR	< 0.03	< 0.03	< 0.04	-	< 0.04	< 0.03	-	< 0.04
Benzo (e) pyrene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Benzo[a]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Benzo[a]pyrene (BAP)	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Benzo[b]fluoranthene + Benzo[j]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Benzo[g,h,i]perylene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Benzo[k]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Chrysene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Dibenzo[a,h]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Fluorene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Indeno(1,2,3-c,d)pyrene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Naphthalene	210[7]	63[7]	63[7]	63[7]	7.2[7]	0.28[8]	<LoR	< 0.06	< 0.06	< 0.07	-	< 0.07	< 0.06	-	< 0.07
Perylene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Phenanthrene	-	-	-	-	-	-	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013
Pyrene	NL[7]	1600[7]	1600[7]	1600[7]	160[7]	7.9[9]	<LoR	< 0.012	< 0.012	< 0.013	-	< 0.013	< 0.012	-	< 0.013

Notes:
All values in mg/kg unless otherwise indicated (i.e. asbestos).
'-' indicates not analysed or no relevant acceptance criteria
<LOR = less than laboratory limit of reporting
Grey font indicates values <LOR
'ND or Asbestos NOT detected' = asbestos not identified to be present by the laboratory method.
NL = Not limiting (i.e. >10,000 mg/kg)

Red values indicate that the results exceed NES Soil criteria: commercial / industrial criteria
▲ values indicate results exceed NES recreational criteria
Dashed outlined values indicate that the results exceed NES Soil criteria: High density residential criteria
Grey Shaded values indicate that the results exceed NES Soil criteria: Residential 10% produce criteria
Underlined values indicates that results exceed the AUP Permitted Activity Criteria
Bold values indicate that results exceed the published background concentrations for non-volcanic soils in the Auckland Region
● values indicate that results exceed typical managed fill criteria

1a - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Commercial/Industrial use (and adopted conservative preliminary screening standard for construction works), unless otherwise
1b - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Recreational use, unless otherwise stated.
1c - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: High density residential use, unless otherwise stated.
1d - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Residential 10% produce, unless otherwise stated.
2 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).
3b - Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: non-volcanic soils
5 - Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.
6 - USPEA Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.
* Ridge Road acceptance criteria based on the published maximum truckload concentrations for deep fill (>2.0m).

Table F2 - Analytical Results

Sample ID								Beachlands (NE samples)_HA24_0.35m-0.60m	Beachlands (NE samples)_HA25_0.30m-0.55m	PT-BL_HA26_0.00m-0.30m	PT-BL_SS01_0.00m-0.10m	PT-BL_SS02_0.00m-0.10m	PT-BL_SS03_0.00m-0.10m	PT-BL_SS04_0.00m-0.10m	PT-BL_SS05_0.00m-0.10m	PT-BL_SS06_0.00m-0.10m
Sample Name / Guideline Values	NES Commercial / Industrial[1a]	NES Recreational[1b]	NES High Density Residential[1c]	NES Residential (10 % produce)[1d]	NES Rural Residential / lifestyle block (25% produce)[1e]	AUP Permitted Activity Criteria[2]	Published Auckland Background Levels (volcanic)[3b]	HA24	HA25	HA26	SS01	SS02	SS03	SS04	SS05	SS06
Depth								0.35	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strata								Fill	Fill	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
Date								09/07/2021	09/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Asbestos (Semi-Quantitative)																
Asbestos type	-		-	-	-	-	ND	Asbestos NOT detected.	Asbestos NOT detected.	-	-	-	-	-	-	-
Asbestos form	-		-	-	-	-	ND	-	-	-	-	-	-	-	-	-
Asbestos as ACM (w/w%)	0.05%*	0.02%*	0.04%*	0.01%*	0.01%*	-	ND	-	-	-	-	-	-	-	-	-
Asbestos Fibres/Fine (w/w %)	0.001%*	0.001%*	0.001%*	0.001%*	0.001%*	-	ND	-	-	-	-	-	-	-	-	-
Metals																
Arsenic	70	80	45	20	17	100	12	2	< 2	3	3	2	2	3	4	2
Cadmium	1300	400	230	3	0.8	7.5	0.65	< 0.10	< 0.10	< 0.10	0.21	0.14	0.2	< 0.10	0.12	0.15
Chromium	6300	2700	1500	460	290	400	55	12	12	14	13	13	13	14	10	11
Copper	>10000	>10000	>10000	>10000	>10000	325	45	5	5	6	6	6	6	6	4	5
Lead	3300	880	500	210	160	250	65	5.7	5	7.3	9.9	9.6	9.1	10.1	8.4	8.5
Nickel	6000[5]	1200[5]	1200[5]	400[5]	-	105	35	5	6	5	3	5	6	5	4	4
Zinc	400000[7]	30000[7]	60000[7]	7400[7]	-	400	180	11	13	15	17	20	21	15	15	16
Organochlorine Pesticides																
2,4'-DDD	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
2,4'DDE	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
2,4'-DDT	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
4,4'-DDD	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
4,4'-DDE	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
4,4'-DDT	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Aldrin	160	70	45	2.6	1.1	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Alpha-BHC	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Beta-BHC	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
cis-Chlordane	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Delta-BHC	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Dieldrin	160	70	45	2.6	1.1	2.7[10]	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endosulfan I	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endosulfan II	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endosulfan sulphate	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endrin	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endrin aldehyde	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Endrin ketone	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Gamma-BHC (Lindane)	14000[10]	1400[10]	700[10]	139[10]	33[10]	140[10]	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Heptachlor	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Heptachlor epoxide	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Hexachlorobenzene	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Methoxychlor	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Total DDT Isomers	1000	400	240	70	45	12	<LoR	-	-	< 0.09	< 0.08	< 0.08	< 0.09	< 0.08	< 0.08	< 0.08
trans-Chlordane	-	-	-	-	-	-	<LoR	-	-	< 0.015	< 0.014	< 0.013	< 0.014	< 0.014	< 0.013	< 0.014
Polycyclic Aromatic Hydrocarbons																
1-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
2-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Acenaphthene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
BaP equivalent	35	40	24	10	6	20	<LoR	< 0.04	-	< 0.04	-	-	-	-	-	-
Benzo (e) pyrene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Benzo[a]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Benzo[a]pyrene (BAP)	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Benzo[k]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Chrysene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Dibenzo[a,h]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Naphthalene	210[7]	63[7]	63[7]	63[7]	7.2[7]	0.28[8]	<LoR	< 0.07	-	< 0.08	-[7]	-	-	-	-	-
Perylene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-
Pyrene	NL[7]	1600[7]	1600[7]	1600[7]	160[7]	7.9[9]	<LoR	< 0.013	-	< 0.015	-	-	-	-	-	-

Notes:
All values in mg/kg unless otherwise indicated (i.e. asbestos).
'-' indicates not analysed or no relevant acceptance criteria
<LOR = less than laboratory limit of reporting
Grey font indicates values <LOR
'ND or Asbestos NOT detected' = asbestos not identified to be present by the laboratory method.
NL = Not limiting (i.e. >10,000 mg/kg)

Red values indicate that the results exceed NES Soil criteria: commercial / industrial criteria
▲ values indicate results exceed NES recreational criteria
Dashed outlined values indicate that the results exceed NES Soil criteria: High density residential criteria
Grey Shaded values indicate that the results exceed NES Soil criteria: Residential 10% produce criteria
Underlined values indicates that results exceed the AUP Permitted Activity Criteria
Bold values indicate that results exceed the published background concentrations for non-volcanic soils in the Auckland Region
● values indicate that results exceed typical managed fill criteria

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1b - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Recreational use, unless otherwise stated.
1c - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: High density residential use, unless otherwise stated.
1d - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Residential 10% produce, unless otherwise stated.
2 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).
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5 - Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.
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7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.
* Ridge Road acceptance criteria based on the published maximum truckload concentrations for deep fill (>2.0m).

Table F2 - Analytical Results

Sample ID								PT-BL_SS07_0.00m-0.10m	PT-BL_SS08_0.00m-0.10m	PT-BL_SS09_0.00m-0.10m	PT-BL_SS10_0.00m-0.10m	HA103 - 0.5	HA103A - 0.0	HA103A - 0.5	HA103B - 0.5	HA103C - 0.0	HA103C - 0.5
Sample Name / Guideline Values	NES Commercial / Industrial[1a]	NES Recreational[1b]	NES High Density Residential[1c]	NES Residential (10 % produce)[1d]	NES Rural Residential / lifestyle block (25% produce)[1e]	AUP Permitted Activity Criteria[2]	Published Auckland Background Levels (volcanic)[3b]	SS07	SS08	SS09	SS10	HA103 - 0.5	HA103A	HA103A	HA103B	HA103C	HA103C
Depth								0.00	0.00	0.00	0.00	0.5	0.0	0.5	0.5	0.0	0.5
Strata								Topsoil	Topsoil	Fill	Topsoil	Clayey SILT	Clayey SILT	Clayey SILT	Clayey SILT	Clayey SILT	Clayey SILT
Date								06/07/2021	06/07/2021	06/07/2021	06/07/2021	23-Nov-21	23-Nov-21	23-Nov-21	23-Nov-21	23-Nov-21	23-Nov-21
Asbestos (Semi-Quantitative)																	
Asbestos type	-		-	-	-	-	ND	-	-	-	-	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Asbestos form	-		-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-
Asbestos as ACM (w/w%)	0.05%*	0.02%*	0.04%*	0.01%*	0.01%*	-	ND	-	-	-	-	-	-	-	-	-	-
Asbestos Fibres/Fine (w/w %)	0.001%*	0.001%*	0.001%*	0.001%*	0.001%*	-	ND	-	-	-	-	-	-	-	-	-	-
Metals																	
Arsenic	70	80	45	20	17	100	12	4	4	35	3	5	-	4	9	-	5
Cadmium	1300	400	230	3	0.8	7.5	0.65	< 0.10	0.13	0.13	< 0.10	< 0.10	-	< 0.10	< 0.10	-	< 0.10
Chromium	6300	2700	1500	460	290	400	55	14	11	19	12	13	-	20	12	-	12
Copper	>10000	>10000	>10000	>10000	>10000	325	45	11	9	31	5	9	-	12	7	-	8
Lead	3300	880	500	210	160	250	65	8.3	8.8	11.9	11.4	6.4	-	6.9	6.5	-	6.2
Nickel	6000[5]	1200[5]	1200[5]	400[5]	-	105	35	16	8	19	4	10	-	17	8	-	10
Zinc	400000[7]	30000[7]	60000[7]	7400[7]	-	400	180	34	36	77	13	24	-	37	22	-	23
Organochlorine Pesticides																	
2,4'-DDD	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
2,4'DDE	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
2,4'-DDT	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
4,4'-DDD	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
4,4'-DDE	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
4,4'-DDT	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Aldrin	160	70	45	2.6	1.1	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Alpha-BHC	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Beta-BHC	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
cis-Chlordane	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Delta-BHC	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Dieldrin	160	70	45	2.6	1.1	2.7[10]	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endosulfan I	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endosulfan II	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endosulfan sulphate	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endrin	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endrin aldehyde	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Endrin ketone	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Gamma-BHC (Lindane)	14000[10]	1400[10]	700[10]	139[10]	33[10]	140[10]	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Heptachlor	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Heptachlor epoxide	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Hexachlorobenzene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Methoxychlor	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Total DDT Isomers	1000	400	240	70	45	12	<LoR	< 0.08	< 0.08	< 0.07	< 0.08	< 0.08	< 0.08	-	< 0.08	< 0.08	-
trans-Chlordane	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	< 0.012	< 0.013	< 0.012	-	< 0.013	< 0.013	-
Polycyclic Aromatic Hydrocarbons																	
1-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3
2-Methylnaphthalene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Acenaphthene	-[6]	-[6]	-[6]	-[6]	-[6]	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Acenaphthylene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
BaP equivalent	35	40	24	10	6	20	<LoR	< 0.04	< 0.04	0.03	-						
Benzo (e) pyrene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	0.016	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Benzo[a]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.025	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Benzo[a]pyrene (BAP)	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.017	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Benzo[b]fluoranthene + Benzo[j]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.029	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Benzo[g,h,i]perylene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	0.012	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Benzo[k]fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Chrysene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.018	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Dibenzo[a,h]anthracene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Fluoranthene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.031	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Fluorene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Indeno(1,2,3-c,d)pyrene	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	refer BAPeq	<LoR	< 0.013	< 0.013	0.012	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Naphthalene	210[7]	63[7]	63[7]	63[7]	7.2[7]	0.28[8]	<LoR	< 0.07	< 0.07	< 0.06	-	< 0.07	-	< 0.07	< 0.07	-	< 0.07
Perylene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Phenanthrene	-	-	-	-	-	-	<LoR	< 0.013	< 0.013	< 0.011	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013
Pyrene	NL[7]	1600[7]	1600[7]	1600[7]	160[7]	7.9[9]	<LoR	< 0.013	< 0.013	0.027	-	< 0.013	-	< 0.013	< 0.013	-	< 0.013

Notes:
All values in mg/kg unless otherwise indicated (i.e. asbestos).
'-' indicates not analysed or no relevant acceptance criteria
<LOR = less than laboratory limit of reporting
Grey font indicates values <LOR
'ND or Asbestos NOT detected' = asbestos not identified to be present by the laboratory method.
NL = Not limiting (i.e. >10,000 mg/kg)

Red values indicate that the results exceed NES Soil criteria: commercial / industrial criteria
▲ values indicate results exceed NES recreational criteria
Dashed outlined values indicate that the results exceed NES Soil criteria: High density residential criteria
Grey Shaded values indicate that the results exceed NES Soil criteria: Residential 10% produce criteria
Underlined values indicates that results exceed the AUP Permitted Activity Criteria
Bold values indicate that results exceed the published background concentrations for non-volcanic soils in the Auckland Region
● values indicate that results exceed typical managed fill criteria

1a - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Commercial/Industrial use (and adopted conservative preliminary screening standard for construction works), unless otherwise
1b - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Recreational use, unless otherwise stated.
1c - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: High density residential use, unless otherwise stated.
1d - MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health: Residential 10% produce, unless otherwise stated.
2 - Auckland Unitary Plan: Operative in Part Version (AUP). Permitted Activity Soil Criteria Table E30.6.1.4.1 (unless otherwise stated).
3b - Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: non-volcanic soils
5 - Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.
6 - USPEA Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
7 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Tier 1 Soil acceptance criteria for applicable pathway.
* Ridge Road acceptance criteria based on the published maximum truckload concentrations for deep fill (>2.0m).

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Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2653061 SPv1
Contact:	Rudolph Kotze C/- Tonkin & Taylor PO Box 5271 Auckland 1141	**Date Received:**	08-Jul-2021
		Date Reported:	15-Jul-2021
		Quote No:	80842
		Order No:	COC1007526
		Client Reference:	1014358.5000
		Submitted By:	Xiao Jin

Sample Type: Soil

Sample Name:		PT-BL_HA10_0.0 0m-0.10m 06-Jul-2021 1:15 pm	PT-BL_HA11_0.0 0m-0.10m 06-Jul-2021 1:27 pm	PT-BL_HA11_0.5 0m-0.60m 06-Jul-2021 1:31 pm	PT-BL_HA12_0.0 0m-0.10m 06-Jul-2021 2:06 pm	PT-BL_HA26_0.0 0m-0.30m 06-Jul-2021 1:41 pm
Lab Number:		2653061.1	2653061.3	2653061.4	2653061.5	2653061.6
Individual Tests						
Dry Matter	g/100g as rcvd	76	79	82	82	68
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	2	4	2	2	3
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.23	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	13	12	10	12	14
Total Recoverable Copper	mg/kg dry wt	5	5	7	5	6
Total Recoverable Lead	mg/kg dry wt	6.7	8.9	6.7	9.1	7.3
Total Recoverable Nickel	mg/kg dry wt	4	14	6	4	5
Total Recoverable Zinc	mg/kg dry wt	8	30	14	13	15
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	-	-	< 0.015
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.015
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.015
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.015
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.015
cis-Chlordane	mg/kg dry wt	-	-	-	-	< 0.015
trans-Chlordane	mg/kg dry wt	-	-	-	-	< 0.015
2,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.015
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.015
2,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.015
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.015
2,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.015
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.015
Total DDT Isomers	mg/kg dry wt	-	-	-	-	< 0.09
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.015
Endosulfan I	mg/kg dry wt	-	-	-	-	< 0.015
Endosulfan II	mg/kg dry wt	-	-	-	-	< 0.015
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 0.015
Endrin	mg/kg dry wt	-	-	-	-	< 0.015
Endrin aldehyde	mg/kg dry wt	-	-	-	-	< 0.015
Endrin ketone	mg/kg dry wt	-	-	-	-	< 0.015
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.015
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.015
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.015
Methoxychlor	mg/kg dry wt	-	-	-	-	< 0.015

Sample Type: Soil						
Sample Name:		PT-BL_HA10_0.00m-0.10m 06-Jul-2021 1:15 pm	PT-BL_HA11_0.00m-0.10m 06-Jul-2021 1:27 pm	PT-BL_HA11_0.50m-0.60m 06-Jul-2021 1:31 pm	PT-BL_HA12_0.00m-0.10m 06-Jul-2021 2:06 pm	PT-BL_HA26_0.00m-0.30m 06-Jul-2021 1:41 pm
Lab Number:		2653061.1	2653061.3	2653061.4	2653061.5	2653061.6
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	< 0.3	< 0.3	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
2-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Acenaphthylene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Acenaphthene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[a]anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	< 0.04	< 0.03	< 0.03	< 0.04
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	< 0.04	< 0.03	< 0.03	< 0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[e]pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Chrysene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Fluorene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Naphthalene	mg/kg dry wt	< 0.07	< 0.07	< 0.06	< 0.06	< 0.08
Perylene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Phenanthrene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015
Pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.012	< 0.015

Sample Name:		PT-BL_HA13_0.00m-0.10m 06-Jul-2021 2:16 pm	PT-BL_HA14_0.00m-0.20m 06-Jul-2021 2:28 pm	PT-BL_HA14_0.20m-0.60m 06-Jul-2021 2:31 pm	PT-BL_HA15_0.00m-0.05m 06-Jul-2021 2:42 pm	PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm
Lab Number:		2653061.9	2653061.11	2653061.12	2653061.13	2653061.15
Individual Tests						
Dry Matter	g/100g as rcvd	75	80	70	81	77
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	3	2	3	< 2
Total Recoverable Cadmium	mg/kg dry wt	0.22	0.19	< 0.10	< 0.10	0.17
Total Recoverable Chromium	mg/kg dry wt	16	22	34	30	11
Total Recoverable Copper	mg/kg dry wt	8	6	10	7	4
Total Recoverable Lead	mg/kg dry wt	9.8	8.3	9.3	9.3	7.9
Total Recoverable Nickel	mg/kg dry wt	7	4	5	3	3
Total Recoverable Zinc	mg/kg dry wt	20	16	22	14	10
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	-	-	< 0.013	-
alpha-BHC	mg/kg dry wt	< 0.013	-	-	< 0.013	-
beta-BHC	mg/kg dry wt	< 0.013	-	-	< 0.013	-
delta-BHC	mg/kg dry wt	< 0.013	-	-	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	-	-	< 0.013	-
cis-Chlordane	mg/kg dry wt	< 0.013	-	-	< 0.013	-
trans-Chlordane	mg/kg dry wt	< 0.013	-	-	< 0.013	-
2,4'-DDD	mg/kg dry wt	< 0.013	-	-	< 0.013	-
4,4'-DDD	mg/kg dry wt	< 0.013	-	-	< 0.013	-
2,4'-DDE	mg/kg dry wt	< 0.013	-	-	< 0.013	-
4,4'-DDE	mg/kg dry wt	< 0.013	-	-	< 0.013	-
2,4'-DDT	mg/kg dry wt	< 0.013	-	-	< 0.013	-
4,4'-DDT	mg/kg dry wt	< 0.013	-	-	< 0.013	-

Sample Type: Soil						
Sample Name:		PT-BL_HA13_0.00m-0.10m 06-Jul-2021 2:16 pm	PT-BL_HA14_0.00m-0.20m 06-Jul-2021 2:28 pm	PT-BL_HA14_0.20m-0.60m 06-Jul-2021 2:31 pm	PT-BL_HA15_0.00m-0.05m 06-Jul-2021 2:42 pm	PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm
Lab Number:		2653061.9	2653061.11	2653061.12	2653061.13	2653061.15
Organochlorine Pesticides Screening in Soil						
Total DDT Isomers	mg/kg dry wt	< 0.08	-	-	< 0.08	-
Dieldrin	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endosulfan I	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endosulfan II	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endrin	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endrin aldehyde	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Endrin ketone	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Heptachlor	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Methoxychlor	mg/kg dry wt	< 0.013	-	-	< 0.013	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.3	< 0.4	< 0.3	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
2-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Acenaphthylene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Acenaphthene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[a]anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.03	< 0.04
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.03	< 0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[e]pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Chrysene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Fluoranthene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Fluorene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Naphthalene	mg/kg dry wt	< 0.07	< 0.07	< 0.08	< 0.07	< 0.07
Perylene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Phenanthrene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013
Pyrene	mg/kg dry wt	< 0.013	< 0.013	< 0.015	< 0.013	< 0.013

Sample Name:		PT-BL_HA16_0.20m-0.60m 06-Jul-2021 2:54 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm	PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm
Lab Number:		2653061.16	2653061.17	2653061.18	2653061.20	2653061.22
Individual Tests						
Dry Matter	g/100g as rcvd	83	85	76	-	78
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	< 2	3	3	2	< 2
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.13	0.16	0.18	0.17
Total Recoverable Chromium	mg/kg dry wt	10	10	13	10	7
Total Recoverable Copper	mg/kg dry wt	< 2	23	5	6	3
Total Recoverable Lead	mg/kg dry wt	5.0	17.1	11.4	10.3	6.1
Total Recoverable Nickel	mg/kg dry wt	3	9	3	3	2
Total Recoverable Zinc	mg/kg dry wt	6	51	13	17	8

Sample Type: Soil						
Sample Name:		PT-BL_HA16_0.20m-0.60m 06-Jul-2021 2:54 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm	PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm
Lab Number:		2653061.16	2653061.17	2653061.18	2653061.20	2653061.22
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	-	-	< 0.013
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.013
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.013
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.013
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.013
cis-Chlordane	mg/kg dry wt	-	-	-	-	< 0.013
trans-Chlordane	mg/kg dry wt	-	-	-	-	< 0.013
2,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.013
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.013
2,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.013
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.013
2,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.013
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.013
Total DDT Isomers	mg/kg dry wt	-	-	-	-	< 0.08
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.013
Endosulfan I	mg/kg dry wt	-	-	-	-	< 0.013
Endosulfan II	mg/kg dry wt	-	-	-	-	< 0.013
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 0.013
Endrin	mg/kg dry wt	-	-	-	-	< 0.013
Endrin aldehyde	mg/kg dry wt	-	-	-	-	< 0.013
Endrin ketone	mg/kg dry wt	-	-	-	-	< 0.013
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.013
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.013
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.013
Methoxychlor	mg/kg dry wt	-	-	-	-	< 0.013
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	< 0.4	-	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
2-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Acenaphthylene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Acenaphthene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Anthracene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[a]anthracene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	< 0.04
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	< 0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[e]pyrene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Chrysene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Fluoranthene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Fluorene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.07	-	< 0.07
Perylene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Phenanthrene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013
Pyrene	mg/kg dry wt	< 0.012	< 0.012	< 0.013	-	< 0.013

Sample Type: Soil						
Sample Name:		PT-BL_HA21_0.20m-0.60m 06-Jul-2021 4:06 pm	PT-BL_HA06_0.00m-0.10m 06-Jul-2021 12:19 pm	PT-BL_HA06_0.50m-0.60m 06-Jul-2021 12:20 pm	PT-BL_HA07_0.00m-0.10m 06-Jul-2021 12:35 pm	PT-BL_HA08_0.50m-0.60m 06-Jul-2021 12:46 pm
Lab Number:		2653061.25	2653061.36	2653061.37	2653061.38	2653061.40
Individual Tests						
Dry Matter	g/100g as rcvd	82	76	80	78	83
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	< 2	-	5	6	4
Total Recoverable Cadmium	mg/kg dry wt	0.15	-	< 0.10	0.14	0.12
Total Recoverable Chromium	mg/kg dry wt	9	-	15	12	12
Total Recoverable Copper	mg/kg dry wt	3	-	10	22	15
Total Recoverable Lead	mg/kg dry wt	6.5	-	7.1	15.4	13.9
Total Recoverable Nickel	mg/kg dry wt	3	-	14	14	9
Total Recoverable Zinc	mg/kg dry wt	9	-	30	71	76
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
alpha-BHC	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
beta-BHC	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
delta-BHC	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
cis-Chlordane	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
trans-Chlordane	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
2,4'-DDD	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
4,4'-DDD	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
2,4'-DDE	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
4,4'-DDE	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
2,4'-DDT	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
4,4'-DDT	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	< 0.08	< 0.08	-
Dieldrin	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endosulfan I	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endosulfan II	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endrin	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endrin aldehyde	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Endrin ketone	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Heptachlor	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Methoxychlor	mg/kg dry wt	< 0.012	< 0.013	< 0.013	< 0.013	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	< 0.3	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
2-Methylnaphthalene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Acenaphthylene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Acenaphthene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Anthracene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[a]anthracene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03	-	< 0.03	< 0.03	< 0.03
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	-	< 0.03	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[e]pyrene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Benzo[k]fluoranthene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Chrysene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012

Sample Type: Soil						
Sample Name:		PT-BL_HA21_0.20m-0.60m 06-Jul-2021 4:06 pm	PT-BL_HA06_0.00m-0.10m 06-Jul-2021 12:19 pm	PT-BL_HA06_0.50m-0.60m 06-Jul-2021 12:20 pm	PT-BL_HA07_0.00m-0.10m 06-Jul-2021 12:35 pm	PT-BL_HA08_0.50m-0.60m 06-Jul-2021 12:46 pm
Lab Number:		2653061.25	2653061.36	2653061.37	2653061.38	2653061.40
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Fluoranthene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Fluorene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Naphthalene	mg/kg dry wt	< 0.06	-	< 0.07	< 0.07	< 0.06
Perylene	mg/kg dry wt	< 0.012	-	0.017	< 0.013	< 0.012
Phenanthrene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012
Pyrene	mg/kg dry wt	< 0.012	-	< 0.013	< 0.013	< 0.012

Sample Name:		PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_SS10_0.00m-0.10m 06-Jul-2021 12:13 pm	PT-BL_SS01_0.00m-0.10m 06-Jul-2021 8:34 am	PT-BL_SS02_0.00m-0.10m 06-Jul-2021 9:29 am	PT-BL_SS03_0.00m-0.10m 06-Jul-2021 9:40 am
Lab Number:		2653061.41	2653061.43	2653061.44	2653061.45	2653061.46
Individual Tests						
Dry Matter	g/100g as rcvd	74	81	75	74	73
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	< 2	3	3	2	2
Total Recoverable Cadmium	mg/kg dry wt	0.11	< 0.10	0.21	0.14	0.20
Total Recoverable Chromium	mg/kg dry wt	9	12	13	13	13
Total Recoverable Copper	mg/kg dry wt	4	5	6	6	6
Total Recoverable Lead	mg/kg dry wt	6.4	11.4	9.9	9.6	9.1
Total Recoverable Nickel	mg/kg dry wt	3	4	3	5	6
Total Recoverable Zinc	mg/kg dry wt	11	13	17	20	21
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
alpha-BHC	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
beta-BHC	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
delta-BHC	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
cis-Chlordane	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
trans-Chlordane	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
2,4'-DDD	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
4,4'-DDD	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
2,4'-DDE	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
4,4'-DDE	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
2,4'-DDT	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
4,4'-DDT	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Total DDT Isomers	mg/kg dry wt	-	< 0.08	< 0.08	< 0.08	< 0.09
Dieldrin	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endosulfan I	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endosulfan II	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endosulfan sulphate	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endrin	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endrin aldehyde	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Endrin ketone	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Heptachlor	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Heptachlor epoxide	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Hexachlorobenzene	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Methoxychlor	mg/kg dry wt	-	< 0.012	< 0.014	< 0.013	< 0.014
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.014	-	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014	-	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.014	-	-	-	-

Sample Type: Soil						
Sample Name:		PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_SS10_0.00m-0.10m 06-Jul-2021 12:13 pm	PT-BL_SS01_0.00m-0.10m 06-Jul-2021 8:34 am	PT-BL_SS02_0.00m-0.10m 06-Jul-2021 9:29 am	PT-BL_SS03_0.00m-0.10m 06-Jul-2021 9:40 am
Lab Number:		2653061.41	2653061.43	2653061.44	2653061.45	2653061.46
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Acenaphthene	mg/kg dry wt	< 0.014	-	-	-	-
Anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	-	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Chrysene	mg/kg dry wt	< 0.014	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Fluorene	mg/kg dry wt	< 0.014	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.014	-	-	-	-
Naphthalene	mg/kg dry wt	< 0.07	-	-	-	-
Perylene	mg/kg dry wt	< 0.014	-	-	-	-
Phenanthrene	mg/kg dry wt	< 0.014	-	-	-	-
Pyrene	mg/kg dry wt	< 0.014	-	-	-	-

Sample Name:		PT-BL_SS04_0.00m-0.10m 06-Jul-2021 10:05 am	PT-BL_SS05_0.00m-0.10m 06-Jul-2021 10:27 am	PT-BL_SS06_0.00m-0.10m 06-Jul-2021 10:36 am	PT-BL_SS07_0.00m-0.10m 06-Jul-2021 11:13 am	PT-BL_SS08_0.00m-0.10m 06-Jul-2021 11:29 am
Lab Number:		2653061.47	2653061.48	2653061.49	2653061.50	2653061.51
Individual Tests						
Dry Matter	g/100g as rcvd	75	79	76	79	79
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	4	2	4	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.12	0.15	< 0.10	0.13
Total Recoverable Chromium	mg/kg dry wt	14	10	11	14	11
Total Recoverable Copper	mg/kg dry wt	6	4	5	11	9
Total Recoverable Lead	mg/kg dry wt	10.1	8.4	8.5	8.3	8.8
Total Recoverable Nickel	mg/kg dry wt	5	4	4	16	8
Total Recoverable Zinc	mg/kg dry wt	15	15	16	34	36
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
alpha-BHC	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
beta-BHC	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
delta-BHC	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
gamma-BHC (Lindane)	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
cis-Chlordane	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
trans-Chlordane	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
2,4'-DDD	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
4,4'-DDD	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
2,4'-DDE	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
4,4'-DDE	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
2,4'-DDT	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
4,4'-DDT	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Dieldrin	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Endosulfan I	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Endosulfan II	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013

Sample Type: Soil						
Sample Name:		PT-BL_SS04_0.00m-0.10m 06-Jul-2021 10:05 am	PT-BL_SS05_0.00m-0.10m 06-Jul-2021 10:27 am	PT-BL_SS06_0.00m-0.10m 06-Jul-2021 10:36 am	PT-BL_SS07_0.00m-0.10m 06-Jul-2021 11:13 am	PT-BL_SS08_0.00m-0.10m 06-Jul-2021 11:29 am
Lab Number:		2653061.47	2653061.48	2653061.49	2653061.50	2653061.51
Organochlorine Pesticides Screening in Soil						
Endosulfan sulphate	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Endrin	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Endrin aldehyde	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Endrin ketone	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Heptachlor	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Heptachlor epoxide	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Hexachlorobenzene	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Methoxychlor	mg/kg dry wt	< 0.014	< 0.013	< 0.014	< 0.013	< 0.013
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	-	< 0.4	< 0.3
1-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
2-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Acenaphthylene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Acenaphthene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Anthracene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[a]anthracene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	< 0.04	< 0.04
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	< 0.04	< 0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[e]pyrene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Chrysene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Fluoranthene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Fluorene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Naphthalene	mg/kg dry wt	-	-	-	< 0.07	< 0.07
Perylene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Phenanthrene	mg/kg dry wt	-	-	-	< 0.013	< 0.013
Pyrene	mg/kg dry wt	-	-	-	< 0.013	< 0.013

Sample Name:		PT-BL_SS09_0.00m-0.10m 06-Jul-2021 11:53 am	PT-BL_Duplicate 3	PT-BL_Duplicate 2	PT-BL_Duplicate 1	PT-BL_Duplicate 4
Lab Number:		2653061.52	2653061.54	2653061.57	2653061.58	2653061.59
Individual Tests						
Dry Matter	g/100g as rcvd	91	81	79	75	79
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	35	3	5	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.10	0.21	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	19	10	13	14	14
Total Recoverable Copper	mg/kg dry wt	31	16	5	9	9
Total Recoverable Lead	mg/kg dry wt	11.9	15.1	8.9	6.7	6.7
Total Recoverable Nickel	mg/kg dry wt	19	6	13	9	12
Total Recoverable Zinc	mg/kg dry wt	77	40	32	28	27
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
alpha-BHC	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
beta-BHC	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013

Sample Type: Soil						
Sample Name:		PT-BL_SS09_0.00m-0.10m 06-Jul-2021 11:53 am	PT-BL_Duplicate 3	PT-BL_Duplicate 2	PT-BL_Duplicate 1	PT-BL_Duplicate 4
Lab Number:		2653061.52	2653061.54	2653061.57	2653061.58	2653061.59
Organochlorine Pesticides Screening in Soil						
delta-BHC	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
cis-Chlordane	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
trans-Chlordane	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
2,4'-DDD	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
4,4'-DDD	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
2,4'-DDE	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
4,4'-DDE	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
2,4'-DDT	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
4,4'-DDT	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Total DDT Isomers	mg/kg dry wt	< 0.07	-	-	< 0.08	< 0.08
Dieldrin	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endosulfan I	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endosulfan II	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endosulfan sulphate	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endrin	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endrin aldehyde	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Endrin ketone	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Heptachlor	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Heptachlor epoxide	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Hexachlorobenzene	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Methoxychlor	mg/kg dry wt	< 0.011	-	-	< 0.013	< 0.013
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	< 0.3	-	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
2-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Acenaphthylene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Acenaphthene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Anthracene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Benzo[a]anthracene	mg/kg dry wt	0.025	< 0.012	< 0.013	-	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.017	< 0.012	< 0.013	-	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.03	< 0.03	< 0.03	-	< 0.03
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.03	< 0.03	< 0.03	-	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.029	< 0.012	< 0.013	-	< 0.013
Benzo[e]pyrene	mg/kg dry wt	0.016	< 0.012	< 0.013	-	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	0.012	< 0.012	< 0.013	-	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	0.011	< 0.012	< 0.013	-	< 0.013
Chrysene	mg/kg dry wt	0.018	< 0.012	< 0.013	-	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Fluoranthene	mg/kg dry wt	0.031	< 0.012	< 0.013	-	< 0.013
Fluorene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.012	< 0.012	< 0.013	-	< 0.013
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.07	-	< 0.07
Perylene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	0.022
Phenanthrene	mg/kg dry wt	< 0.011	< 0.012	< 0.013	-	< 0.013
Pyrene	mg/kg dry wt	0.027	< 0.012	< 0.013	-	< 0.013

Sample Name:		PT-BL_HA22_0.0-0.1m	PT-BL_HA23_0.35-0.6m	PT-BL_HA24_0.35-0.6m	PT-BL_HA25_0.30-0.55m	
Lab Number:		2653061.60	2653061.62	2653061.64	2653061.66	

Sample Type: Soil						
Sample Name:		PT-BL_HA22_0.0-0.1m	PT-BL_HA23_0.35-0.6m	PT-BL_HA24_0.35-0.6m	PT-BL_HA25_0.30-0.55m	
Lab Number:		2653061.60	2653061.62	2653061.64	2653061.66	
Individual Tests						
Dry Matter	g/100g as rcvd	-	77	76	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	2	2	< 2	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Total Recoverable Chromium	mg/kg dry wt	9	11	12	12	-
Total Recoverable Copper	mg/kg dry wt	9	6	5	5	-
Total Recoverable Lead	mg/kg dry wt	7.4	6.8	5.7	5.0	-
Total Recoverable Nickel	mg/kg dry wt	6	8	5	6	-
Total Recoverable Zinc	mg/kg dry wt	32	24	11	13	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.4	< 0.4	-	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Acenaphthylene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Acenaphthene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Anthracene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[a]anthracene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.04	< 0.04	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.04	< 0.04	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[e]pyrene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Chrysene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Fluoranthene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Fluorene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Naphthalene	mg/kg dry wt	-	< 0.07	< 0.07	-	-
Perylene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Phenanthrene	mg/kg dry wt	-	< 0.013	< 0.013	-	-
Pyrene	mg/kg dry wt	-	< 0.013	< 0.013	-	-

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**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3-6, 9, 11-13, 15-18, 20, 22, 25, 37-38, 40-41, 43-52, 54, 57-60, 62, 64, 66
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 20, 22, 25, 37-38, 40-41, 43-52, 54, 57-60, 62, 64, 66
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	6, 9, 13, 22, 25, 36-38, 43-52, 58-59
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 3-6, 9, 11-13, 15-18, 22, 25, 36-38, 40-41, 43-52, 54, 57-59, 62, 64
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64

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

Testing was completed between 14-Jul-2021 and 15-Jul-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.

Kim Harrison MSc
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2653061	SUPv1
Contact:	Rudolph Kotze C/- Tonkin & Taylor PO Box 5271 Auckland 1141	**Date Received:**	08-Jul-2021	
		Date Reported:	15-Jul-2021	
		Quote No:	80842	
		Order No:	COC1007526	
		Client Reference:	1014358.5000	
		Submitted By:	Xiao Jin	

Sample Type: Soil

Sample Name:		PT-BL_HA10_0.00m-0.10m 06-Jul-2021 1:15 pm	PT-BL_HA11_0.00m-0.10m 06-Jul-2021 1:27 pm	PT-BL_HA11_0.50m-0.60m 06-Jul-2021 1:31 pm	PT-BL_HA12_0.00m-0.10m 06-Jul-2021 2:06 pm
Lab Number:		2653061.1	2653061.3	2653061.4	2653061.5
Individual Tests					
Dry Matter	g/100g as rcvd	75.7 ± 5.0	78.5 ± 5.0	81.8 ± 5.0	81.7 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2.3 ± 1.4	4.2 ± 1.5	2.2 ± 1.4	2.4 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10 ± 0.067	0.232 ± 0.073	< 0.10 ± 0.067	< 0.10 ± 0.067
Total Recoverable Chromium	mg/kg dry wt	12.6 ± 2.4	12.1 ± 2.3	10.0 ± 2.1	11.6 ± 2.3
Total Recoverable Copper	mg/kg dry wt	5.0 ± 1.5	4.9 ± 1.5	7.2 ± 1.7	5.1 ± 1.5
Total Recoverable Lead	mg/kg dry wt	6.7 ± 1.1	8.9 ± 1.4	6.7 ± 1.1	9.1 ± 1.4
Total Recoverable Nickel	mg/kg dry wt	3.5 ± 1.4	13.6 ± 2.2	5.9 ± 1.6	3.9 ± 1.5
Total Recoverable Zinc	mg/kg dry wt	8.0 ± 2.8	29.9 ± 3.4	13.7 ± 2.9	12.5 ± 2.8
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032	< 0.012 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032	< 0.012 ± 0.032
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0071	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Anthracene	mg/kg dry wt	< 0.013 ± 0.0072	< 0.013 ± 0.0072	< 0.012 ± 0.0070	< 0.012 ± 0.0070
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0071	< 0.012 ± 0.0070	< 0.012 ± 0.0070
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0096	< 0.03 ± 0.0096
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0096	< 0.03 ± 0.0096
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0070	< 0.013 ± 0.0070	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	< 0.07 ± 0.035	< 0.06 ± 0.035	< 0.06 ± 0.035
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Pyrene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068

Sample Type: Soil					
Sample Name:		PT-BL_HA26_0.00m-0.30m 06-Jul-2021 1:41 pm	PT-BL_HA13_0.00m-0.10m 06-Jul-2021 2:16 pm	PT-BL_HA14_0.00m-0.20m 06-Jul-2021 2:28 pm	PT-BL_HA14_0.20m-0.60m 06-Jul-2021 2:31 pm
Lab Number:		2653061.6	2653061.9	2653061.11	2653061.12
Individual Tests					
Dry Matter	g/100g as rcvd	67.8 ± 5.0	75.4 ± 5.0	80.4 ± 5.0	69.7 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	3.3 ± 1.4	4.8 ± 1.5	3.0 ± 1.4	2.2 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10 ± 0.067	0.216 ± 0.072	0.191 ± 0.071	< 0.10 ± 0.067
Total Recoverable Chromium	mg/kg dry wt	13.8 ± 2.5	16.2 ± 2.9	22.5 ± 3.8	34.5 ± 5.5
Total Recoverable Copper	mg/kg dry wt	5.7 ± 1.6	7.6 ± 1.7	6.3 ± 1.6	9.7 ± 1.9
Total Recoverable Lead	mg/kg dry wt	7.3 ± 1.2	9.8 ± 1.5	8.3 ± 1.3	9.3 ± 1.5
Total Recoverable Nickel	mg/kg dry wt	4.7 ± 1.5	6.7 ± 1.6	3.8 ± 1.4	4.6 ± 1.5
Total Recoverable Zinc	mg/kg dry wt	14.5 ± 2.9	20.3 ± 3.1	15.7 ± 2.9	22.1 ± 3.1
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.015 ± 0.0052	< 0.013 ± 0.0049	-	-
alpha-BHC	mg/kg dry wt	< 0.015 ± 0.0052	< 0.013 ± 0.0049	-	-
beta-BHC	mg/kg dry wt	< 0.015 ± 0.0061	< 0.013 ± 0.0056	-	-
delta-BHC	mg/kg dry wt	< 0.015 ± 0.0057	< 0.013 ± 0.0052	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.015 ± 0.0050	< 0.013 ± 0.0047	-	-
cis-Chlordane	mg/kg dry wt	< 0.015 ± 0.0054	< 0.013 ± 0.0051	-	-
trans-Chlordane	mg/kg dry wt	< 0.015 ± 0.0052	< 0.013 ± 0.0049	-	-
2,4'-DDD	mg/kg dry wt	< 0.015 ± 0.0059	< 0.013 ± 0.0054	-	-
4,4'-DDD	mg/kg dry wt	< 0.015 ± 0.0072	< 0.013 ± 0.0066	-	-
2,4'-DDE	mg/kg dry wt	< 0.015 ± 0.0054	< 0.013 ± 0.0051	-	-
4,4'-DDE	mg/kg dry wt	< 0.015 ± 0.0075	< 0.013 ± 0.0068	-	-
2,4'-DDT	mg/kg dry wt	< 0.015 ± 0.0077	< 0.013 ± 0.0070	-	-
4,4'-DDT	mg/kg dry wt	< 0.015 ± 0.0084	< 0.013 ± 0.0076	-	-
Total DDT Isomers	mg/kg dry wt	< 0.09 ± 0.018	< 0.08 ± 0.016	-	-
Dieldrin	mg/kg dry wt	< 0.015 ± 0.0068	< 0.013 ± 0.0062	-	-
Endosulfan I	mg/kg dry wt	< 0.015 ± 0.0059	< 0.013 ± 0.0054	-	-
Endosulfan II	mg/kg dry wt	< 0.015 ± 0.0068	< 0.013 ± 0.0062	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.015 ± 0.0089	< 0.013 ± 0.0080	-	-
Endrin	mg/kg dry wt	< 0.015 ± 0.0094	< 0.013 ± 0.0084	-	-
Endrin aldehyde	mg/kg dry wt	< 0.015 ± 0.0082	< 0.013 ± 0.0074	-	-
Endrin ketone	mg/kg dry wt	< 0.015 ± 0.0072	< 0.013 ± 0.0066	-	-
Heptachlor	mg/kg dry wt	< 0.015 ± 0.0057	< 0.013 ± 0.0052	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.015 ± 0.0050	< 0.013 ± 0.0047	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.015 ± 0.0057	< 0.013 ± 0.0052	-	-
Methoxychlor	mg/kg dry wt	< 0.015 ± 0.0094	< 0.013 ± 0.0084	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	< 0.3	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.015 ± 0.032	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.015 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	< 0.015 ± 0.032	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.015 ± 0.032
Acenaphthylene	mg/kg dry wt	< 0.015 ± 0.0068	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.015 ± 0.0068
Acenaphthene	mg/kg dry wt	< 0.015 ± 0.0073	< 0.013 ± 0.0070	< 0.013 ± 0.0070	< 0.015 ± 0.0073
Anthracene	mg/kg dry wt	< 0.015 ± 0.0074	< 0.013 ± 0.0072	< 0.013 ± 0.0071	< 0.015 ± 0.0074
Benzo[a]anthracene	mg/kg dry wt	< 0.015 ± 0.0073	< 0.013 ± 0.0071	< 0.013 ± 0.0070	< 0.015 ± 0.0073
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.015 ± 0.0067	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.015 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0097	< 0.04 ± 0.0097
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0097	< 0.04 ± 0.0097
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.015 ± 0.0071	< 0.013 ± 0.0070	< 0.013 ± 0.0069	< 0.015 ± 0.0071
Benzo[e]pyrene	mg/kg dry wt	< 0.015 ± 0.0067	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.015 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0069
Benzo[k]fluoranthene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0069
Chrysene	mg/kg dry wt	< 0.015 ± 0.0070	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.015 ± 0.0070
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0069

Sample Type: Soil					
Sample Name:		PT-BL_HA26_0.00m-0.30m 06-Jul-2021 1:41 pm	PT-BL_HA13_0.00m-0.10m 06-Jul-2021 2:16 pm	PT-BL_HA14_0.00m-0.20m 06-Jul-2021 2:28 pm	PT-BL_HA14_0.20m-0.60m 06-Jul-2021 2:31 pm
Lab Number:		2653061.6	2653061.9	2653061.11	2653061.12
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Fluoranthene	mg/kg dry wt	< 0.015 ± 0.0068	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0068
Fluorene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0069
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.015 ± 0.0068	< 0.013 ± 0.0068	< 0.013 ± 0.0067	< 0.015 ± 0.0068
Naphthalene	mg/kg dry wt	< 0.08 ± 0.036	< 0.07 ± 0.035	< 0.07 ± 0.035	< 0.08 ± 0.036
Perylene	mg/kg dry wt	< 0.015 ± 0.0067	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.015 ± 0.0067
Phenanthrene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.015 ± 0.0069
Pyrene	mg/kg dry wt	< 0.015 ± 0.0069	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.015 ± 0.0069

Sample Name:		PT-BL_HA15_0.00m-0.05m 06-Jul-2021 2:42 pm	PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm	PT-BL_HA16_0.20m-0.60m 06-Jul-2021 2:54 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm
Lab Number:		2653061.13	2653061.15	2653061.16	2653061.17
Individual Tests					
Dry Matter	g/100g as rcvd	80.7 ± 5.0	77.4 ± 5.0	82.6 ± 5.0	85.0 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2.7 ± 1.4	< 2 ± 1.4	< 2 ± 1.4	3.2 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10 ± 0.067	0.171 ± 0.070	< 0.10 ± 0.067	0.128 ± 0.068
Total Recoverable Chromium	mg/kg dry wt	29.6 ± 4.8	10.6 ± 2.1	10.0 ± 2.1	10.2 ± 2.1
Total Recoverable Copper	mg/kg dry wt	7.0 ± 1.7	3.6 ± 1.4	< 2 ± 1.4	23.1 ± 3.5
Total Recoverable Lead	mg/kg dry wt	9.3 ± 1.5	7.9 ± 1.3	4.98 ± 0.79	17.1 ± 2.6
Total Recoverable Nickel	mg/kg dry wt	3.1 ± 1.4	3.5 ± 1.4	2.7 ± 1.4	9.3 ± 1.8
Total Recoverable Zinc	mg/kg dry wt	14.4 ± 2.9	10.0 ± 2.8	5.5 ± 2.7	51.2 ± 4.5
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.013 ± 0.0048	-	-	-
alpha-BHC	mg/kg dry wt	< 0.013 ± 0.0048	-	-	-
beta-BHC	mg/kg dry wt	< 0.013 ± 0.0055	-	-	-
delta-BHC	mg/kg dry wt	< 0.013 ± 0.0051	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013 ± 0.0046	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.013 ± 0.0050	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.013 ± 0.0048	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0053	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0064	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0050	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0066	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0068	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0074	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08 ± 0.016	-	-	-
Dieldrin	mg/kg dry wt	< 0.013 ± 0.0060	-	-	-
Endosulfan I	mg/kg dry wt	< 0.013 ± 0.0053	-	-	-
Endosulfan II	mg/kg dry wt	< 0.013 ± 0.0060	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013 ± 0.0078	-	-	-
Endrin	mg/kg dry wt	< 0.013 ± 0.0082	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013 ± 0.0072	-	-	-
Endrin ketone	mg/kg dry wt	< 0.013 ± 0.0064	-	-	-
Heptachlor	mg/kg dry wt	< 0.013 ± 0.0051	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013 ± 0.0046	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013 ± 0.0051	-	-	-
Methoxychlor	mg/kg dry wt	< 0.013 ± 0.0082	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.4	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032	< 0.012 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032	< 0.012 ± 0.032
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0070	< 0.013 ± 0.0071	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Anthracene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0072	< 0.012 ± 0.0070	< 0.012 ± 0.0070

Sample Type: Soil					
Sample Name:		PT-BL_HA15_0.00m-0.05m 06-Jul-2021 2:42 pm	PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm	PT-BL_HA16_0.20m-0.60m 06-Jul-2021 2:54 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm
Lab Number:		2653061.13	2653061.15	2653061.16	2653061.17
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0070	< 0.013 ± 0.0071	< 0.012 ± 0.0070	< 0.012 ± 0.0069
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0096	< 0.03 ± 0.0096
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03 ± 0.0097	< 0.04 ± 0.0097	< 0.03 ± 0.0096	< 0.03 ± 0.0096
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0070	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0067
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069	< 0.012 ± 0.0069
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0067
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0068	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	< 0.07 ± 0.035	< 0.06 ± 0.035	< 0.06 ± 0.034
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067	< 0.012 ± 0.0067
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069	< 0.012 ± 0.0068
Pyrene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068	< 0.012 ± 0.0068

Sample Name:		PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm	PT-BL_HA21_0.20m-0.60m 06-Jul-2021 4:06 pm
Lab Number:		2653061.18	2653061.20	2653061.22	2653061.25
Individual Tests					
Dry Matter	g/100g as rcvd	75.8 ± 5.0	-	78.1 ± 5.0	81.8 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2.8 ± 1.4	2.0 ± 1.4	< 2 ± 1.4	< 2 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	0.158 ± 0.069	0.180 ± 0.070	0.169 ± 0.070	0.148 ± 0.069
Total Recoverable Chromium	mg/kg dry wt	13.2 ± 2.5	9.6 ± 2.0	7.0 ± 1.7	8.9 ± 1.9
Total Recoverable Copper	mg/kg dry wt	5.1 ± 1.5	5.8 ± 1.6	3.0 ± 1.4	3.5 ± 1.4
Total Recoverable Lead	mg/kg dry wt	11.4 ± 1.8	10.3 ± 1.6	6.14 ± 0.96	6.5 ± 1.1
Total Recoverable Nickel	mg/kg dry wt	3.5 ± 1.4	2.7 ± 1.4	2.3 ± 1.4	3.0 ± 1.4
Total Recoverable Zinc	mg/kg dry wt	13.2 ± 2.9	17.3 ± 3.0	8.3 ± 2.8	9.2 ± 2.8
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	-	< 0.013 ± 0.0049	< 0.012 ± 0.0047
alpha-BHC	mg/kg dry wt	-	-	< 0.013 ± 0.0049	< 0.012 ± 0.0047
beta-BHC	mg/kg dry wt	-	-	< 0.013 ± 0.0056	< 0.012 ± 0.0053
delta-BHC	mg/kg dry wt	-	-	< 0.013 ± 0.0052	< 0.012 ± 0.0050
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.013 ± 0.0047	< 0.012 ± 0.0045
cis-Chlordane	mg/kg dry wt	-	-	< 0.013 ± 0.0050	< 0.012 ± 0.0048
trans-Chlordane	mg/kg dry wt	-	-	< 0.013 ± 0.0049	< 0.012 ± 0.0047
2,4'-DDD	mg/kg dry wt	-	-	< 0.013 ± 0.0054	< 0.012 ± 0.0051
4,4'-DDD	mg/kg dry wt	-	-	< 0.013 ± 0.0065	< 0.012 ± 0.0062
2,4'-DDE	mg/kg dry wt	-	-	< 0.013 ± 0.0050	< 0.012 ± 0.0048
4,4'-DDE	mg/kg dry wt	-	-	< 0.013 ± 0.0067	< 0.012 ± 0.0063
2,4'-DDT	mg/kg dry wt	-	-	< 0.013 ± 0.0069	< 0.012 ± 0.0065
4,4'-DDT	mg/kg dry wt	-	-	< 0.013 ± 0.0075	< 0.012 ± 0.0071
Total DDT Isomers	mg/kg dry wt	-	-	< 0.08 ± 0.016	< 0.08 ± 0.015
Dieldrin	mg/kg dry wt	-	-	< 0.013 ± 0.0061	< 0.012 ± 0.0058
Endosulfan I	mg/kg dry wt	-	-	< 0.013 ± 0.0054	< 0.012 ± 0.0051
Endosulfan II	mg/kg dry wt	-	-	< 0.013 ± 0.0061	< 0.012 ± 0.0058
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.013 ± 0.0079	< 0.012 ± 0.0075
Endrin	mg/kg dry wt	-	-	< 0.013 ± 0.0084	< 0.012 ± 0.0079
Endrin aldehyde	mg/kg dry wt	-	-	< 0.013 ± 0.0073	< 0.012 ± 0.0069

Sample Type: Soil					
Sample Name:		PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm	PT-BL_HA21_0.20m-0.60m 06-Jul-2021 4:06 pm
Lab Number:		2653061.18	2653061.20	2653061.22	2653061.25
Organochlorine Pesticides Screening in Soil					
Endrin ketone	mg/kg dry wt	-	-	< 0.013 ± 0.0065	< 0.012 ± 0.0062
Heptachlor	mg/kg dry wt	-	-	< 0.013 ± 0.0052	< 0.012 ± 0.0050
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.013 ± 0.0047	< 0.012 ± 0.0045
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.013 ± 0.0052	< 0.012 ± 0.0050
Methoxychlor	mg/kg dry wt	-	-	< 0.013 ± 0.0084	< 0.012 ± 0.0079
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	< 0.4	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	-	< 0.013 ± 0.032	< 0.012 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	-	< 0.013 ± 0.032	< 0.012 ± 0.032
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0071	-	< 0.013 ± 0.0070	< 0.012 ± 0.0069
Anthracene	mg/kg dry wt	< 0.013 ± 0.0072	-	< 0.013 ± 0.0072	< 0.012 ± 0.0070
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0071	-	< 0.013 ± 0.0071	< 0.012 ± 0.0070
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	-	< 0.04 ± 0.0097	< 0.03 ± 0.0096
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	-	< 0.04 ± 0.0097	< 0.03 ± 0.0096
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0070	-	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	< 0.012 ± 0.0067
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	-	< 0.07 ± 0.035	< 0.06 ± 0.035
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Pyrene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0068	< 0.012 ± 0.0068

Sample Name:		PT-BL_HA06_0.00m-0.10m 06-Jul-2021 12:19 pm	PT-BL_HA06_0.50m-0.60m 06-Jul-2021 12:20 pm	PT-BL_HA07_0.00m-0.10m 06-Jul-2021 12:35 pm	PT-BL_HA08_0.50m-0.60m 06-Jul-2021 12:46 pm
Lab Number:		2653061.36	2653061.37	2653061.38	2653061.40
Individual Tests					
Dry Matter	g/100g as rcvd	76.5 ± 5.0	80.1 ± 5.0	78.0 ± 5.0	83.4 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	-	5.0 ± 1.5	5.6 ± 1.6	4.5 ± 1.5
Total Recoverable Cadmium	mg/kg dry wt	-	< 0.10 ± 0.067	0.135 ± 0.068	0.121 ± 0.068
Total Recoverable Chromium	mg/kg dry wt	-	14.6 ± 2.7	12.1 ± 2.3	12.3 ± 2.4
Total Recoverable Copper	mg/kg dry wt	-	9.7 ± 1.9	22.2 ± 3.3	15.3 ± 2.5
Total Recoverable Lead	mg/kg dry wt	-	7.1 ± 1.1	15.4 ± 2.4	13.9 ± 2.1
Total Recoverable Nickel	mg/kg dry wt	-	13.6 ± 2.2	14.1 ± 2.3	9.0 ± 1.8
Total Recoverable Zinc	mg/kg dry wt	-	29.7 ± 3.4	70.9 ± 5.7	75.6 ± 6.0
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.013 ± 0.0048	-
alpha-BHC	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.013 ± 0.0048	-
beta-BHC	mg/kg dry wt	< 0.013 ± 0.0055	< 0.013 ± 0.0054	< 0.013 ± 0.0055	-
delta-BHC	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0051	< 0.013 ± 0.0051	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013 ± 0.0047	< 0.013 ± 0.0046	< 0.013 ± 0.0046	-
cis-Chlordane	mg/kg dry wt	< 0.013 ± 0.0050	< 0.013 ± 0.0049	< 0.013 ± 0.0050	-
trans-Chlordane	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.013 ± 0.0048	-
2,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0054	< 0.013 ± 0.0052	< 0.013 ± 0.0053	-

Sample Type: Soil					
Sample Name:		PT-BL_HA06_0.00m-0.10m 06-Jul-2021 12:19 pm	PT-BL_HA06_0.50m-0.60m 06-Jul-2021 12:20 pm	PT-BL_HA07_0.00m-0.10m 06-Jul-2021 12:35 pm	PT-BL_HA08_0.50m-0.60m 06-Jul-2021 12:46 pm
Lab Number:		2653061.36	2653061.37	2653061.38	2653061.40
Organochlorine Pesticides Screening in Soil					
4,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0065	< 0.013 ± 0.0063	< 0.013 ± 0.0064	-
2,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0050	< 0.013 ± 0.0049	< 0.013 ± 0.0050	-
4,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0065	< 0.013 ± 0.0066	-
2,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0067	< 0.013 ± 0.0068	-
4,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0075	< 0.013 ± 0.0073	< 0.013 ± 0.0074	-
Total DDT Isomers	mg/kg dry wt	< 0.08 ± 0.016	< 0.08 ± 0.016	< 0.08 ± 0.016	-
Dieldrin	mg/kg dry wt	< 0.013 ± 0.0061	< 0.013 ± 0.0060	< 0.013 ± 0.0060	-
Endosulfan I	mg/kg dry wt	< 0.013 ± 0.0054	< 0.013 ± 0.0052	< 0.013 ± 0.0053	-
Endosulfan II	mg/kg dry wt	< 0.013 ± 0.0061	< 0.013 ± 0.0060	< 0.013 ± 0.0060	-
Endosulfan sulphate	mg/kg dry wt	< 0.013 ± 0.0079	< 0.013 ± 0.0077	< 0.013 ± 0.0078	-
Endrin	mg/kg dry wt	< 0.013 ± 0.0083	< 0.013 ± 0.0081	< 0.013 ± 0.0082	-
Endrin aldehyde	mg/kg dry wt	< 0.013 ± 0.0073	< 0.013 ± 0.0071	< 0.013 ± 0.0072	-
Endrin ketone	mg/kg dry wt	< 0.013 ± 0.0065	< 0.013 ± 0.0063	< 0.013 ± 0.0064	-
Heptachlor	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0051	< 0.013 ± 0.0051	-
Heptachlor epoxide	mg/kg dry wt	< 0.013 ± 0.0047	< 0.013 ± 0.0046	< 0.013 ± 0.0046	-
Hexachlorobenzene	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0051	< 0.013 ± 0.0051	-
Methoxychlor	mg/kg dry wt	< 0.013 ± 0.0083	< 0.013 ± 0.0081	< 0.013 ± 0.0082	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.3	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	-	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	-	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.012 ± 0.032
Acenaphthylene	mg/kg dry wt	-	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Acenaphthene	mg/kg dry wt	-	< 0.013 ± 0.0070	< 0.013 ± 0.0070	< 0.012 ± 0.0069
Anthracene	mg/kg dry wt	-	< 0.013 ± 0.0071	< 0.013 ± 0.0071	< 0.012 ± 0.0070
Benzo[a]anthracene	mg/kg dry wt	-	< 0.013 ± 0.0070	< 0.013 ± 0.0070	< 0.012 ± 0.0070
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.03 ± 0.0097	< 0.03 ± 0.0097	< 0.03 ± 0.0096
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.03 ± 0.0097	< 0.03 ± 0.0097	< 0.03 ± 0.0096
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Benzo[e]pyrene	mg/kg dry wt	-	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Chrysene	mg/kg dry wt	-	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Fluoranthene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Fluorene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Naphthalene	mg/kg dry wt	-	< 0.07 ± 0.035	< 0.07 ± 0.035	< 0.06 ± 0.035
Perylene	mg/kg dry wt	-	0.0167 ± 0.0068	< 0.013 ± 0.0067	< 0.012 ± 0.0067
Phenanthrene	mg/kg dry wt	-	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.012 ± 0.0069
Pyrene	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.012 ± 0.0068

Sample Name:		PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_SS10_0.00m-0.10m 06-Jul-2021 12:13 pm	PT-BL_SS01_0.00m-0.10m 06-Jul-2021 8:34 am	PT-BL_SS02_0.00m-0.10m 06-Jul-2021 9:29 am
Lab Number:		2653061.41	2653061.43	2653061.44	2653061.45
Individual Tests					
Dry Matter	g/100g as rcvd	74.3 ± 5.0	80.8 ± 5.0	75.3 ± 5.0	74.0 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	< 2 ± 1.4	2.5 ± 1.4	2.9 ± 1.4	2.4 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	0.110 ± 0.067	< 0.10 ± 0.067	0.211 ± 0.072	0.143 ± 0.069
Total Recoverable Chromium	mg/kg dry wt	9.3 ± 2.0	12.2 ± 2.3	12.5 ± 2.4	13.3 ± 2.5
Total Recoverable Copper	mg/kg dry wt	3.9 ± 1.5	5.3 ± 1.5	5.8 ± 1.6	6.3 ± 1.6

Sample Type: Soil					
Sample Name:		PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_SS10_0.00m-0.10m 06-Jul-2021 12:13 pm	PT-BL_SS01_0.00m-0.10m 06-Jul-2021 8:34 am	PT-BL_SS02_0.00m-0.10m 06-Jul-2021 9:29 am
Lab Number:		2653061.41	2653061.43	2653061.44	2653061.45
Heavy Metals, Screen Level					
Total Recoverable Lead	mg/kg dry wt	6.4 ± 1.0	11.4 ± 1.8	9.9 ± 1.6	9.6 ± 1.5
Total Recoverable Nickel	mg/kg dry wt	3.1 ± 1.4	3.6 ± 1.4	3.0 ± 1.4	5.5 ± 1.5
Total Recoverable Zinc	mg/kg dry wt	10.6 ± 2.8	13.5 ± 2.9	17.2 ± 3.0	19.6 ± 3.0
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	< 0.012 ± 0.0047	< 0.014 ± 0.0050	< 0.013 ± 0.0049
alpha-BHC	mg/kg dry wt	-	< 0.012 ± 0.0047	< 0.014 ± 0.0050	< 0.013 ± 0.0049
beta-BHC	mg/kg dry wt	-	< 0.012 ± 0.0053	< 0.014 ± 0.0058	< 0.013 ± 0.0057
delta-BHC	mg/kg dry wt	-	< 0.012 ± 0.0050	< 0.014 ± 0.0054	< 0.013 ± 0.0053
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.012 ± 0.0045	< 0.014 ± 0.0048	< 0.013 ± 0.0048
cis-Chlordane	mg/kg dry wt	-	< 0.012 ± 0.0048	< 0.014 ± 0.0052	< 0.013 ± 0.0051
trans-Chlordane	mg/kg dry wt	-	< 0.012 ± 0.0047	< 0.014 ± 0.0050	< 0.013 ± 0.0049
2,4'-DDD	mg/kg dry wt	-	< 0.012 ± 0.0051	< 0.014 ± 0.0056	< 0.013 ± 0.0055
4,4'-DDD	mg/kg dry wt	-	< 0.012 ± 0.0062	< 0.014 ± 0.0068	< 0.013 ± 0.0067
2,4'-DDE	mg/kg dry wt	-	< 0.012 ± 0.0048	< 0.014 ± 0.0052	< 0.013 ± 0.0051
4,4'-DDE	mg/kg dry wt	-	< 0.012 ± 0.0063	< 0.014 ± 0.0070	< 0.013 ± 0.0069
2,4'-DDT	mg/kg dry wt	-	< 0.012 ± 0.0065	< 0.014 ± 0.0072	< 0.013 ± 0.0071
4,4'-DDT	mg/kg dry wt	-	< 0.012 ± 0.0071	< 0.014 ± 0.0079	< 0.013 ± 0.0077
Total DDT Isomers	mg/kg dry wt	-	< 0.08 ± 0.015	< 0.08 ± 0.017	< 0.08 ± 0.016
Dieldrin	mg/kg dry wt	-	< 0.012 ± 0.0058	< 0.014 ± 0.0064	< 0.013 ± 0.0063
Endosulfan I	mg/kg dry wt	-	< 0.012 ± 0.0051	< 0.014 ± 0.0056	< 0.013 ± 0.0055
Endosulfan II	mg/kg dry wt	-	< 0.012 ± 0.0058	< 0.014 ± 0.0064	< 0.013 ± 0.0063
Endosulfan sulphate	mg/kg dry wt	-	< 0.012 ± 0.0075	< 0.014 ± 0.0083	< 0.013 ± 0.0082
Endrin	mg/kg dry wt	-	< 0.012 ± 0.0078	< 0.014 ± 0.0088	< 0.013 ± 0.0086
Endrin aldehyde	mg/kg dry wt	-	< 0.012 ± 0.0069	< 0.014 ± 0.0076	< 0.013 ± 0.0075
Endrin ketone	mg/kg dry wt	-	< 0.012 ± 0.0062	< 0.014 ± 0.0068	< 0.013 ± 0.0067
Heptachlor	mg/kg dry wt	-	< 0.012 ± 0.0050	< 0.014 ± 0.0054	< 0.013 ± 0.0053
Heptachlor epoxide	mg/kg dry wt	-	< 0.012 ± 0.0045	< 0.014 ± 0.0048	< 0.013 ± 0.0048
Hexachlorobenzene	mg/kg dry wt	-	< 0.012 ± 0.0050	< 0.014 ± 0.0054	< 0.013 ± 0.0053
Methoxychlor	mg/kg dry wt	-	< 0.012 ± 0.0078	< 0.014 ± 0.0088	< 0.013 ± 0.0086
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.014 ± 0.032	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014 ± 0.032	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.014 ± 0.0068	-	-	-
Acenaphthene	mg/kg dry wt	< 0.014 ± 0.0071	-	-	-
Anthracene	mg/kg dry wt	< 0.014 ± 0.0072	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.014 ± 0.0071	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.014 ± 0.0067	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.014 ± 0.0070	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.014 ± 0.0067	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.014 ± 0.0068	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.014 ± 0.0069	-	-	-
Chrysene	mg/kg dry wt	< 0.014 ± 0.0069	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.014 ± 0.0069	-	-	-
Fluoranthene	mg/kg dry wt	< 0.014 ± 0.0068	-	-	-
Fluorene	mg/kg dry wt	< 0.014 ± 0.0068	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.014 ± 0.0068	-	-	-
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	-	-	-
Perylene	mg/kg dry wt	< 0.014 ± 0.0067	-	-	-
Phenanthrene	mg/kg dry wt	< 0.014 ± 0.0069	-	-	-

Sample Type: Soil					
Sample Name:		PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_SS10_0.00m-0.10m 06-Jul-2021 12:13 pm	PT-BL_SS01_0.00m-0.10m 06-Jul-2021 8:34 am	PT-BL_SS02_0.00m-0.10m 06-Jul-2021 9:29 am
Lab Number:		2653061.41	2653061.43	2653061.44	2653061.45
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Pyrene	mg/kg dry wt	< 0.014 ± 0.0069	-	-	-

Sample Name:		PT-BL_SS03_0.00m-0.10m 06-Jul-2021 9:40 am	PT-BL_SS04_0.00m-0.10m 06-Jul-2021 10:05 am	PT-BL_SS05_0.00m-0.10m 06-Jul-2021 10:27 am	PT-BL_SS06_0.00m-0.10m 06-Jul-2021 10:36 am
Lab Number:		2653061.46	2653061.47	2653061.48	2653061.49
Individual Tests					
Dry Matter	g/100g as rcvd	72.9 ± 5.0	75.0 ± 5.0	78.6 ± 5.0	75.6 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2.4 ± 1.4	3.1 ± 1.4	3.6 ± 1.5	2.4 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	0.196 ± 0.071	< 0.10 ± 0.067	0.125 ± 0.068	0.152 ± 0.069
Total Recoverable Chromium	mg/kg dry wt	13.5 ± 2.5	14.0 ± 2.6	9.6 ± 2.0	10.8 ± 2.2
Total Recoverable Copper	mg/kg dry wt	6.4 ± 1.6	6.0 ± 1.6	4.3 ± 1.5	4.6 ± 1.5
Total Recoverable Lead	mg/kg dry wt	9.1 ± 1.4	10.1 ± 1.6	8.4 ± 1.3	8.5 ± 1.3
Total Recoverable Nickel	mg/kg dry wt	5.8 ± 1.6	5.2 ± 1.5	3.9 ± 1.5	4.3 ± 1.5
Total Recoverable Zinc	mg/kg dry wt	20.9 ± 3.1	15.0 ± 2.9	15.0 ± 2.9	15.6 ± 2.9
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.014 ± 0.0051	< 0.014 ± 0.0050	< 0.013 ± 0.0048	< 0.014 ± 0.0050
alpha-BHC	mg/kg dry wt	< 0.014 ± 0.0051	< 0.014 ± 0.0050	< 0.013 ± 0.0048	< 0.014 ± 0.0050
beta-BHC	mg/kg dry wt	< 0.014 ± 0.0059	< 0.014 ± 0.0057	< 0.013 ± 0.0054	< 0.014 ± 0.0057
delta-BHC	mg/kg dry wt	< 0.014 ± 0.0055	< 0.014 ± 0.0053	< 0.013 ± 0.0051	< 0.014 ± 0.0054
gamma-BHC (Lindane)	mg/kg dry wt	< 0.014 ± 0.0049	< 0.014 ± 0.0048	< 0.013 ± 0.0046	< 0.014 ± 0.0048
cis-Chlordane	mg/kg dry wt	< 0.014 ± 0.0053	< 0.014 ± 0.0051	< 0.013 ± 0.0049	< 0.014 ± 0.0052
trans-Chlordane	mg/kg dry wt	< 0.014 ± 0.0051	< 0.014 ± 0.0050	< 0.013 ± 0.0048	< 0.014 ± 0.0050
2,4'-DDD	mg/kg dry wt	< 0.014 ± 0.0057	< 0.014 ± 0.0055	< 0.013 ± 0.0052	< 0.014 ± 0.0056
4,4'-DDD	mg/kg dry wt	< 0.014 ± 0.0069	< 0.014 ± 0.0067	< 0.013 ± 0.0063	< 0.014 ± 0.0068
2,4'-DDE	mg/kg dry wt	< 0.014 ± 0.0053	< 0.014 ± 0.0051	< 0.013 ± 0.0049	< 0.014 ± 0.0052
4,4'-DDE	mg/kg dry wt	< 0.014 ± 0.0072	< 0.014 ± 0.0069	< 0.013 ± 0.0065	< 0.014 ± 0.0070
2,4'-DDT	mg/kg dry wt	< 0.014 ± 0.0074	< 0.014 ± 0.0071	< 0.013 ± 0.0067	< 0.014 ± 0.0072
4,4'-DDT	mg/kg dry wt	< 0.014 ± 0.0081	< 0.014 ± 0.0078	< 0.013 ± 0.0073	< 0.014 ± 0.0079
Total DDT Isomers	mg/kg dry wt	< 0.09 ± 0.017	< 0.08 ± 0.017	< 0.08 ± 0.016	< 0.08 ± 0.017
Dieldrin	mg/kg dry wt	< 0.014 ± 0.0065	< 0.014 ± 0.0063	< 0.013 ± 0.0060	< 0.014 ± 0.0064
Endosulfan I	mg/kg dry wt	< 0.014 ± 0.0057	< 0.014 ± 0.0055	< 0.013 ± 0.0052	< 0.014 ± 0.0056
Endosulfan II	mg/kg dry wt	< 0.014 ± 0.0065	< 0.014 ± 0.0063	< 0.013 ± 0.0060	< 0.014 ± 0.0064
Endosulfan sulphate	mg/kg dry wt	< 0.014 ± 0.0085	< 0.014 ± 0.0082	< 0.013 ± 0.0077	< 0.014 ± 0.0083
Endrin	mg/kg dry wt	< 0.014 ± 0.0090	< 0.014 ± 0.0087	< 0.013 ± 0.0081	< 0.014 ± 0.0087
Endrin aldehyde	mg/kg dry wt	< 0.014 ± 0.0078	< 0.014 ± 0.0076	< 0.013 ± 0.0071	< 0.014 ± 0.0076
Endrin ketone	mg/kg dry wt	< 0.014 ± 0.0069	< 0.014 ± 0.0067	< 0.013 ± 0.0063	< 0.014 ± 0.0068
Heptachlor	mg/kg dry wt	< 0.014 ± 0.0055	< 0.014 ± 0.0053	< 0.013 ± 0.0051	< 0.014 ± 0.0054
Heptachlor epoxide	mg/kg dry wt	< 0.014 ± 0.0049	< 0.014 ± 0.0048	< 0.013 ± 0.0046	< 0.014 ± 0.0048
Hexachlorobenzene	mg/kg dry wt	< 0.014 ± 0.0055	< 0.014 ± 0.0053	< 0.013 ± 0.0051	< 0.014 ± 0.0054
Methoxychlor	mg/kg dry wt	< 0.014 ± 0.0090	< 0.014 ± 0.0087	< 0.013 ± 0.0081	< 0.014 ± 0.0087

Sample Name:		PT-BL_SS07_0.00m-0.10m 06-Jul-2021 11:13 am	PT-BL_SS08_0.00m-0.10m 06-Jul-2021 11:29 am	PT-BL_SS09_0.00m-0.10m 06-Jul-2021 11:53 am	PT-BL_Duplicate 3
Lab Number:		2653061.50	2653061.51	2653061.52	2653061.54
Individual Tests					
Dry Matter	g/100g as rcvd	78.6 ± 5.0	79.4 ± 5.0	91.5 ± 5.0	80.9 ± 5.0
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	3.6 ± 1.5	3.9 ± 1.5	35.1 ± 5.4	2.7 ± 1.4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10 ± 0.067	0.129 ± 0.068	0.129 ± 0.068	0.105 ± 0.067
Total Recoverable Chromium	mg/kg dry wt	14.3 ± 2.6	11.2 ± 2.2	19.2 ± 3.3	10.0 ± 2.1
Total Recoverable Copper	mg/kg dry wt	11.2 ± 2.1	8.8 ± 1.8	31.1 ± 4.5	16.0 ± 2.6
Total Recoverable Lead	mg/kg dry wt	8.3 ± 1.3	8.8 ± 1.4	11.9 ± 1.9	15.1 ± 2.3
Total Recoverable Nickel	mg/kg dry wt	16.1 ± 2.5	7.7 ± 1.7	19.4 ± 2.9	5.7 ± 1.6

Sample Type: Soil					
Sample Name:		PT-BL_SS07_0.00m-0.10m 06-Jul-2021 11:13 am	PT-BL_SS08_0.00m-0.10m 06-Jul-2021 11:29 am	PT-BL_SS09_0.00m-0.10m 06-Jul-2021 11:53 am	PT-BL_Duplicate 3
Lab Number:		2653061.50	2653061.51	2653061.52	2653061.54
Heavy Metals, Screen Level					
Total Recoverable Zinc	mg/kg dry wt	34.4 ± 3.6	36.5 ± 3.7	77.1 ± 6.1	39.6 ± 3.9
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.011 ± 0.0044	-
alpha-BHC	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.011 ± 0.0044	-
beta-BHC	mg/kg dry wt	< 0.013 ± 0.0055	< 0.013 ± 0.0055	< 0.011 ± 0.0049	-
delta-BHC	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0052	< 0.011 ± 0.0047	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013 ± 0.0047	< 0.013 ± 0.0047	< 0.011 ± 0.0043	-
cis-Chlordane	mg/kg dry wt	< 0.013 ± 0.0050	< 0.013 ± 0.0050	< 0.011 ± 0.0045	-
trans-Chlordane	mg/kg dry wt	< 0.013 ± 0.0048	< 0.013 ± 0.0048	< 0.011 ± 0.0044	-
2,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0054	< 0.013 ± 0.0053	< 0.011 ± 0.0048	-
4,4'-DDD	mg/kg dry wt	< 0.013 ± 0.0065	< 0.013 ± 0.0065	< 0.011 ± 0.0057	-
2,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0050	< 0.013 ± 0.0050	< 0.011 ± 0.0045	-
4,4'-DDE	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.011 ± 0.0058	-
2,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.011 ± 0.0060	-
4,4'-DDT	mg/kg dry wt	< 0.013 ± 0.0075	< 0.013 ± 0.0075	< 0.011 ± 0.0065	-
Total DDT Isomers	mg/kg dry wt	< 0.08 ± 0.016	< 0.08 ± 0.016	< 0.07 ± 0.014	-
Dieldrin	mg/kg dry wt	< 0.013 ± 0.0061	< 0.013 ± 0.0061	< 0.011 ± 0.0054	-
Endosulfan I	mg/kg dry wt	< 0.013 ± 0.0054	< 0.013 ± 0.0053	< 0.011 ± 0.0048	-
Endosulfan II	mg/kg dry wt	< 0.013 ± 0.0061	< 0.013 ± 0.0061	< 0.011 ± 0.0054	-
Endosulfan sulphate	mg/kg dry wt	< 0.013 ± 0.0079	< 0.013 ± 0.0079	< 0.011 ± 0.0068	-
Endrin	mg/kg dry wt	< 0.013 ± 0.0083	< 0.013 ± 0.0083	< 0.011 ± 0.0071	-
Endrin aldehyde	mg/kg dry wt	< 0.013 ± 0.0073	< 0.013 ± 0.0073	< 0.011 ± 0.0063	-
Endrin ketone	mg/kg dry wt	< 0.013 ± 0.0065	< 0.013 ± 0.0065	< 0.011 ± 0.0057	-
Heptachlor	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0052	< 0.011 ± 0.0047	-
Heptachlor epoxide	mg/kg dry wt	< 0.013 ± 0.0047	< 0.013 ± 0.0047	< 0.011 ± 0.0043	-
Hexachlorobenzene	mg/kg dry wt	< 0.013 ± 0.0052	< 0.013 ± 0.0052	< 0.011 ± 0.0047	-
Methoxychlor	mg/kg dry wt	< 0.013 ± 0.0083	< 0.013 ± 0.0083	< 0.011 ± 0.0071	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.3	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.011 ± 0.032	< 0.012 ± 0.032
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	< 0.011 ± 0.032	< 0.012 ± 0.032
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.011 ± 0.0067	< 0.012 ± 0.0067
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0070	< 0.013 ± 0.0070	< 0.011 ± 0.0068	< 0.012 ± 0.0069
Anthracene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0071	< 0.011 ± 0.0069	< 0.012 ± 0.0071
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0070	0.0249 ± 0.0090	< 0.012 ± 0.0070
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	0.0174 ± 0.0068	< 0.012 ± 0.0067
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	0.0287 ± 0.0097	< 0.03 ± 0.0096
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	0.0284 ± 0.0097	< 0.03 ± 0.0096
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	0.0285 ± 0.0087	< 0.012 ± 0.0069
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	0.0163 ± 0.0068	< 0.012 ± 0.0067
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	0.0125 ± 0.0068	< 0.012 ± 0.0068
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	0.0112 ± 0.0068	< 0.012 ± 0.0068
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	0.0178 ± 0.0072	< 0.012 ± 0.0069
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.011 ± 0.0068	< 0.012 ± 0.0068
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	0.0310 ± 0.0073	< 0.012 ± 0.0068
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	< 0.011 ± 0.0068	< 0.012 ± 0.0068
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	0.0122 ± 0.0067	< 0.012 ± 0.0067
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	< 0.07 ± 0.035	< 0.06 ± 0.034	< 0.06 ± 0.035
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	< 0.011 ± 0.0067	< 0.012 ± 0.0067
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	< 0.011 ± 0.0068	< 0.012 ± 0.0069
Pyrene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	0.0268 ± 0.0075	< 0.012 ± 0.0068

Sample Type: Soil					
Sample Name:		PT-BL_Duplicate 2	PT-BL_Duplicate 1	PT-BL_Duplicate 4	PT-BL_HA22_0.0-0.1 m
Lab Number:		2653061.57	2653061.58	2653061.59	2653061.60
Individual Tests					
Dry Matter	g/100g as rcvd	78.6 ± 5.0	75.4 ± 5.0	79.3 ± 5.0	-
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	5.1 ± 1.6	5.2 ± 1.6	5.0 ± 1.5	5.0 ± 1.5
Total Recoverable Cadmium	mg/kg dry wt	0.208 ± 0.072	< 0.10 ± 0.067	< 0.10 ± 0.067	< 0.10 ± 0.067
Total Recoverable Chromium	mg/kg dry wt	13.4 ± 2.5	13.6 ± 2.5	13.7 ± 2.5	8.7 ± 1.9
Total Recoverable Copper	mg/kg dry wt	5.4 ± 1.5	9.3 ± 1.9	8.7 ± 1.8	8.6 ± 1.8
Total Recoverable Lead	mg/kg dry wt	8.9 ± 1.4	6.7 ± 1.1	6.7 ± 1.1	7.4 ± 1.2
Total Recoverable Nickel	mg/kg dry wt	13.1 ± 2.2	9.3 ± 1.8	11.7 ± 2.0	5.7 ± 1.5
Total Recoverable Zinc	mg/kg dry wt	31.7 ± 3.5	27.9 ± 3.3	26.8 ± 3.3	32.5 ± 3.5
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	< 0.013 ± 0.0049	< 0.013 ± 0.0048	-
alpha-BHC	mg/kg dry wt	-	< 0.013 ± 0.0049	< 0.013 ± 0.0048	-
beta-BHC	mg/kg dry wt	-	< 0.013 ± 0.0056	< 0.013 ± 0.0054	-
delta-BHC	mg/kg dry wt	-	< 0.013 ± 0.0052	< 0.013 ± 0.0051	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.013 ± 0.0047	< 0.013 ± 0.0046	-
cis-Chlordane	mg/kg dry wt	-	< 0.013 ± 0.0051	< 0.013 ± 0.0049	-
trans-Chlordane	mg/kg dry wt	-	< 0.013 ± 0.0049	< 0.013 ± 0.0048	-
2,4'-DDD	mg/kg dry wt	-	< 0.013 ± 0.0054	< 0.013 ± 0.0053	-
4,4'-DDD	mg/kg dry wt	-	< 0.013 ± 0.0066	< 0.013 ± 0.0064	-
2,4'-DDE	mg/kg dry wt	-	< 0.013 ± 0.0051	< 0.013 ± 0.0049	-
4,4'-DDE	mg/kg dry wt	-	< 0.013 ± 0.0068	< 0.013 ± 0.0065	-
2,4'-DDT	mg/kg dry wt	-	< 0.013 ± 0.0070	< 0.013 ± 0.0067	-
4,4'-DDT	mg/kg dry wt	-	< 0.013 ± 0.0076	< 0.013 ± 0.0073	-
Total DDT Isomers	mg/kg dry wt	-	< 0.08 ± 0.016	< 0.08 ± 0.016	-
Dieldrin	mg/kg dry wt	-	< 0.013 ± 0.0062	< 0.013 ± 0.0060	-
Endosulfan I	mg/kg dry wt	-	< 0.013 ± 0.0054	< 0.013 ± 0.0053	-
Endosulfan II	mg/kg dry wt	-	< 0.013 ± 0.0062	< 0.013 ± 0.0060	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.013 ± 0.0080	< 0.013 ± 0.0077	-
Endrin	mg/kg dry wt	-	< 0.013 ± 0.0085	< 0.013 ± 0.0081	-
Endrin aldehyde	mg/kg dry wt	-	< 0.013 ± 0.0074	< 0.013 ± 0.0071	-
Endrin ketone	mg/kg dry wt	-	< 0.013 ± 0.0066	< 0.013 ± 0.0064	-
Heptachlor	mg/kg dry wt	-	< 0.013 ± 0.0052	< 0.013 ± 0.0051	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.013 ± 0.0047	< 0.013 ± 0.0046	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.013 ± 0.0052	< 0.013 ± 0.0051	-
Methoxychlor	mg/kg dry wt	-	< 0.013 ± 0.0085	< 0.013 ± 0.0081	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	< 0.3	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	-	< 0.013 ± 0.032	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	-	< 0.013 ± 0.032	-
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	-
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0070	-	< 0.013 ± 0.0070	-
Anthracene	mg/kg dry wt	< 0.013 ± 0.0071	-	< 0.013 ± 0.0071	-
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0070	-	< 0.013 ± 0.0070	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03 ± 0.0097	-	< 0.03 ± 0.0097	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03 ± 0.0097	-	< 0.03 ± 0.0097	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0069	-
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0069	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-

Sample Type: Soil					
Sample Name:		PT-BL_Duplicate 2	PT-BL_Duplicate 1	PT-BL_Duplicate 4	PT-BL_HA22_0.0-0.1 m
Lab Number:		2653061.57	2653061.58	2653061.59	2653061.60
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0067	-	< 0.013 ± 0.0067	-
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	-	< 0.07 ± 0.035	-
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	-	0.0218 ± 0.0069	-
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	-	< 0.013 ± 0.0069	-
Pyrene	mg/kg dry wt	< 0.013 ± 0.0068	-	< 0.013 ± 0.0068	-

Sample Name:		PT-BL_HA23_0.35-0.6 m	PT-BL_HA24_0.35-0.6 m	PT-BL_HA25_0.30-0.55m	
Lab Number:		2653061.62	2653061.64	2653061.66	
Individual Tests					
Dry Matter	g/100g as rcvd	77.1 ± 5.0	76.4 ± 5.0	-	-
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2.3 ± 1.4	2.4 ± 1.4	< 2 ± 1.4	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10 ± 0.067	< 0.10 ± 0.067	< 0.10 ± 0.067	-
Total Recoverable Chromium	mg/kg dry wt	11.3 ± 2.2	12.3 ± 2.4	12.1 ± 2.3	-
Total Recoverable Copper	mg/kg dry wt	5.7 ± 1.6	5.0 ± 1.5	5.0 ± 1.5	-
Total Recoverable Lead	mg/kg dry wt	6.8 ± 1.1	5.67 ± 0.89	4.97 ± 0.79	-
Total Recoverable Nickel	mg/kg dry wt	7.8 ± 1.7	4.9 ± 1.5	6.5 ± 1.6	-
Total Recoverable Zinc	mg/kg dry wt	23.7 ± 3.2	10.5 ± 2.8	13.2 ± 2.9	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013 ± 0.032	< 0.013 ± 0.032	-	-
Acenaphthylene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0067	-	-
Acenaphthene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0071	-	-
Anthracene	mg/kg dry wt	< 0.013 ± 0.0072	< 0.013 ± 0.0072	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.013 ± 0.0071	< 0.013 ± 0.0071	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04 ± 0.0097	< 0.04 ± 0.0097	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013 ± 0.0070	< 0.013 ± 0.0070	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	-	-
Chrysene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0068	-	-
Fluoranthene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	-	-
Fluorene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013 ± 0.0068	< 0.013 ± 0.0068	-	-
Naphthalene	mg/kg dry wt	< 0.07 ± 0.035	< 0.07 ± 0.035	-	-
Perylene	mg/kg dry wt	< 0.013 ± 0.0067	< 0.013 ± 0.0067	-	-
Phenanthrene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0069	-	-
Pyrene	mg/kg dry wt	< 0.013 ± 0.0069	< 0.013 ± 0.0068	-	-

The reported uncertainty is an expanded uncertainty with a level of confidence of approximately 95 percent (i.e. two standard deviations, calculated using a coverage factor of 2). Reported uncertainties are calculated from the performance of typical matrices, and do not include variation due to sampling.

For further information on uncertainty of measurement at Hill Laboratories, refer to the technical note on our website: www.hill-laboratories.com/files/Intro_To_UOM.pdf, or contact the laboratory.

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
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3-6, 9, 11-13, 15-18, 20, 22, 25, 37-38, 40-41, 43-52, 54, 57-60, 62, 64, 66
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 20, 22, 25, 37-38, 40-41, 43-52, 54, 57-60, 62, 64, 66
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	6, 9, 13, 22, 25, 36-38, 43-52, 58-59
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 3-6, 9, 11-13, 15-18, 22, 25, 36-38, 40-41, 43-52, 54, 57-59, 62, 64
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	1, 3-6, 9, 11-13, 15-18, 22, 25, 37-38, 40-41, 50-52, 54, 57, 59, 62, 64

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

Testing was completed between 14-Jul-2021 and 15-Jul-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.

Kim Harrison MSc
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2653178	A2Pv2
Contact:	Rudolph Kotze C/- Tonkin & Taylor PO Box 5271 Auckland 1141	**Date Received:**	08-Jul-2021	
		Date Reported:	16-Jul-2021	
		Quote No:	80842	
		Order No:	1014358.5000	
		Client Reference:	1014358.5000	
		Add. Client Ref:	COC1007526	
		Submitted By:	Xiao Jin	

Sample Type: Soil

Sample Name:		PT-BL_HA10_0.00m-0.10m 06-Jul-2021 1:15 pm	PT-BL_HA11_0.00m-0.10m 06-Jul-2021 1:27 pm	PT-BL_HA12_0.00m-0.10m 06-Jul-2021 2:06 pm	PT-BL_HA14_0.00m-0.20m 06-Jul-2021 2:28 pm	PT-BL_HA15_0.00m-0.05m 06-Jul-2021 2:42 pm
Lab Number:		2653178.1	2653178.3	2653178.5	2653178.11	2653178.13
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	770.9	813.0	766.5	770.1	870.2
Dry Weight	g	595.4	644.8	621.5	620.2	705.8
Moisture	%	23	21	19	19	19
Sample Fraction >10mm	g dry wt	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sample Fraction <10mm to >2mm	g dry wt	86.7	37.9	50.4	59.4	199.2
Sample Fraction <2mm	g dry wt	507.0	606.2	570.0	559.6	504.6
<2mm Subsample Weight	g dry wt	59.2	56.8	55.9	55.3	52.6
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm	PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm
Lab Number:		2653178.15	2653178.17	2653178.18	2653178.20	2653178.22
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Sample Type: Soil						
Sample Name:		PT-BL_HA16_0.00m-0.10m 06-Jul-2021 2:51 pm	PT-BL_HA17_0.00m-0.10m 06-Jul-2021 3:08 pm	PT-BL_HA18_0.00m-0.10m 06-Jul-2021 3:29 pm	PT-BL_HA19_0.00m-0.30m 06-Jul-2021 3:38 pm	PT-BL_HA20_0.00m-0.30m 06-Jul-2021 3:51 pm
Lab Number:		2653178.15	2653178.17	2653178.18	2653178.20	2653178.22
As Received Weight	g	695.4	891.8	667.1	577.2	738.9
Dry Weight	g	542.4	792.4	495.0	379.9	572.3
Moisture	%	22	11	26	34	23
Sample Fraction >10mm	g dry wt	< 0.1	338.0	< 0.1	< 0.1	< 0.1
Sample Fraction <10mm to >2mm	g dry wt	40.4	249.5	2.5	< 0.1	20.2
Sample Fraction <2mm	g dry wt	500.4	204.3	491.9	379.8	551.5
<2mm Subsample Weight	g dry wt	51.6	52.3	55.8	52.1	57.2
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		PT-BL_HA21_0.20m-0.60m 06-Jul-2021 4:06 pm	PT-BL_HA07_0.00m-0.10m 06-Jul-2021 12:35 pm	PT-BL_HA08_0.50m-0.60m 06-Jul-2021 12:46 pm	PT-BL_HA09_0.00m-0.10m 06-Jul-2021 1:03 pm	PT-BL_HA22_0.0-0.10m
Lab Number:		2653178.25	2653178.26	2653178.28	2653178.29	2653178.41
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	747.1	709.2	734.8	718.0	743.4
Dry Weight	g	609.8	589.9	613.3	543.5	628.0
Moisture	%	18	17	17	24	16
Sample Fraction >10mm	g dry wt	< 0.1	172.8	114.6	9.8	101.6
Sample Fraction <10mm to >2mm	g dry wt	40.4	212.4	223.2	32.3	308.7
Sample Fraction <2mm	g dry wt	568.5	204.4	273.7	500.6	216.2
<2mm Subsample Weight	g dry wt	58.7	54.3	52.5	56.5	52.1
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		PT-BL_HA23_0.35-0.60m	PT-BL_HA24_0.35-0.60m	PT-BL_HA25_0.30-0.55m	PT-BL_HA01_0.00m-0.10m 06-Jul-2021 9:34 am	PT-BL_HA02_0.00m-0.10m 06-Jul-2021 9:56 am
Lab Number:		2653178.43	2653178.45	2653178.47	2653178.48	2653178.50
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Sample Type: Soil						
Sample Name:		PT-BL_HA23_0.35-0.60m	PT-BL_HA24_0.35-0.60m	PT-BL_HA25_0.30-0.55m	PT-BL_HA01_0.00m-0.10m 06-Jul-2021 9:34 am	PT-BL_HA02_0.00m-0.10m 06-Jul-2021 9:56 am
Lab Number:		2653178.43	2653178.45	2653178.47	2653178.48	2653178.50
As Received Weight	g	727.6	572.6	640.6	640.3	724.1
Dry Weight	g	588.4	453.2	509.3	475.2	523.8
Moisture	%	19	21	20	26	28
Sample Fraction >10mm	g dry wt	< 0.1	< 0.1	< 0.1	< 0.1	18.6
Sample Fraction <10mm to >2mm	g dry wt	143.0	129.0	99.6	94.9	72.7
Sample Fraction <2mm	g dry wt	443.6	322.7	408.0	379.4	430.8
<2mm Subsample Weight	g dry wt	57.7	54.8	58.7	50.6	55.6
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		PT-BL_HA03_0.40m-0.65m 06-Jul-2021 10:18 am	PT-BL_HA04_0.00m-0.10m 06-Jul-2021 10:43 am	PT-BL_HA05_0.00m-0.15m 06-Jul-2021 10:45 am	PT-BL_HA06_0.50m-0.60m 06-Jul-2021 12:20 pm	
Lab Number:		2653178.53	2653178.54	2653178.56	2653178.59	
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	-
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
As Received Weight	g	669.5	657.7	684.6	499.2	-
Dry Weight	g	518.0	459.6	484.9	400.9	-
Moisture	%	23	30	29	20	-
Sample Fraction >10mm	g dry wt	95.8	< 0.1	< 0.1	28.1	-
Sample Fraction <10mm to >2mm	g dry wt	249.9	2.4	< 0.1	130.1	-
Sample Fraction <2mm	g dry wt	171.0	457.0	483.8	242.7	-
<2mm Subsample Weight	g dry wt	55.6	53.2	59.6	53.1	-
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-

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.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

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**
Individual Tests			
Wgt of Asbestos as Asbestos Fines in <10mm >2mm Fraction*	Measurement on analytical balance, from the <10mm >2mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.00001 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
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, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
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, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 3, 5, 11, 13, 15, 17-18, 20, 22, 25-26, 28-29, 41, 43, 45, 47-48, 50, 53-54, 56, 59

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

Testing was completed between 13-Jul-2021 and 16-Jul-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.

Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

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TRIED, TESTED AND TRUSTED

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Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2779567 SPv1
Contact:	Rudolph Kotze C/- Tonkin & Taylor PO Box 5271 Auckland 1141	**Date Received:**	25-Nov-2021
		Date Reported:	06-Dec-2021
		Quote No:	80842
		Order No:	1014358.5000
		Client Reference:	1014358.5000
		Submitted By:	Rudolph Kotze

Sample Type: Soil

Sample Name:		HA103 - 0.5 23-Nov-2021	Dup1 - 0.5 23-Nov-2021	HA103A - 0.0 23-Nov-2021	HA103A - 0.5 23-Nov-2021	Dup2 - 0.5 23-Nov-2021
Lab Number:		2779567.2	2779567.3	2779567.4	2779567.5	2779567.6
Individual Tests						
Dry Matter	g/100g as rcvd	80	79	80	81	81
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	5	-	4	3
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	-	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	13	15	-	20	14
Total Recoverable Copper	mg/kg dry wt	9	10	-	12	10
Total Recoverable Lead	mg/kg dry wt	6.4	7.4	-	6.9	6.7
Total Recoverable Nickel	mg/kg dry wt	10	13	-	17	11
Total Recoverable Zinc	mg/kg dry wt	24	32	-	37	28
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	-	< 0.012	-	-
alpha-BHC	mg/kg dry wt	< 0.013	-	< 0.012	-	-
beta-BHC	mg/kg dry wt	< 0.013	-	< 0.012	-	-
delta-BHC	mg/kg dry wt	< 0.013	-	< 0.012	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	-	< 0.012	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	-	< 0.012	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	-	< 0.012	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	-	< 0.012	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	-	< 0.012	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	-	< 0.012	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	-	< 0.012	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	-	< 0.012	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	-	< 0.08	-	-
Dieldrin	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endosulfan I	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endosulfan II	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endrin	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Endrin ketone	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Heptachlor	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	-	< 0.012	-	-
Methoxychlor	mg/kg dry wt	< 0.013	-	< 0.012	-	-

Sample Type: Soil						
Sample Name:		HA103 - 0.5 23-Nov-2021	Dup1 - 0.5 23-Nov-2021	HA103A - 0.0 23-Nov-2021	HA103A - 0.5 23-Nov-2021	Dup2 - 0.5 23-Nov-2021
Lab Number:		2779567.2	2779567.3	2779567.4	2779567.5	2779567.6
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	-	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
2-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Acenaphthylene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Acenaphthene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Anthracene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[a]anthracene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[e]pyrene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Chrysene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Fluoranthene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Fluorene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Naphthalene	mg/kg dry wt	< 0.07	< 0.07	-	< 0.07	< 0.06
Perylene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Phenanthrene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012
Pyrene	mg/kg dry wt	< 0.013	< 0.013	-	< 0.013	< 0.012

Sample Name:		HA103B - 0.5 23-Nov-2021	HA103C - 0.0 23-Nov-2021	HA103C - 0.5 23-Nov-2021		
Lab Number:		2779567.8	2779567.9	2779567.10		
Individual Tests						
Dry Matter	g/100g as rcvd	81	81	80	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	9	-	5	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	12	-	12	-	-
Total Recoverable Copper	mg/kg dry wt	7	-	8	-	-
Total Recoverable Lead	mg/kg dry wt	6.5	-	6.2	-	-
Total Recoverable Nickel	mg/kg dry wt	8	-	10	-	-
Total Recoverable Zinc	mg/kg dry wt	22	-	23	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
alpha-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
beta-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
delta-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	< 0.013	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	< 0.013	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	-	-	-
Dieldrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endosulfan I	mg/kg dry wt	< 0.013	< 0.013	-	-	-

Sample Type: Soil						
Sample Name:		HA103B - 0.5 23-Nov-2021	HA103C - 0.0 23-Nov-2021	HA103C - 0.5 23-Nov-2021		
Lab Number:		2779567.8	2779567.9	2779567.10		
Organochlorine Pesticides Screening in Soil						
Endosulfan II	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin ketone	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Heptachlor	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Methoxychlor	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	< 0.3	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Acenaphthylene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Acenaphthene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Anthracene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03	-	< 0.03	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	-	< 0.03	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Chrysene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Fluoranthene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Fluorene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Naphthalene	mg/kg dry wt	< 0.07	-	< 0.07	-	-
Perylene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Phenanthrene	mg/kg dry wt	< 0.013	-	< 0.013	-	-
Pyrene	mg/kg dry wt	< 0.013	-	< 0.013	-	-

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**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	2-3, 5-6, 8, 10
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	2-3, 5-6, 8, 10
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	2-3, 5-6, 8, 10
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	2, 4, 8-9
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	2-3, 5-6, 8, 10

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	2-6, 8-10
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	2-3, 5-6, 8, 10
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	2-3, 5-6, 8, 10

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

Testing was completed between 03-Dec-2021 and 06-Dec-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.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Hill Laboratories
TRIED, TESTED AND TRUSTED

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Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2779595	A2Pv1
Contact:	Rudolph Kotze	**Date Received:**	25-Nov-2021	
	C/- Tonkin & Taylor	**Date Reported:**	06-Dec-2021	
	PO Box 5271	**Quote No:**	80842	
	Auckland 1141	**Order No:**	1014358.5000	
		Client Reference:	1014358.5000	
		Add. Client Ref:	Sampled: 23/11	
		Submitted By:	Rudolph Kotze	

Sample Type: Soil

Sample Name:		HA103 - 0.5	HA103A - 0.5	HA103B - 0.5	HA103C - 0.5	
Lab Number:		2779595.2	2779595.4	2779595.6	2779595.8	
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	-
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
As Received Weight	g	640.6	715.1	691.4	681.5	-
Dry Weight	g	510.1	575.4	601.0	550.2	-
Moisture	%	20	20	13	19	-
Sample Fraction >10mm*	g dry wt	< 0.1	7.6	10.5	< 0.1	-
Sample Fraction <10mm to >2mm*	g dry wt	190.6	219.9	205.9	213.0	-
Sample Fraction <2mm*	g dry wt	318.6	347.4	384.3	336.9	-
<2mm Subsample Weight*	g dry wt	52.3	50.2	51.4	53.3	-
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-

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.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

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
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	2, 4, 6, 8
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	2, 4, 6, 8
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	2, 4, 6, 8
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	2, 4, 6, 8
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	2, 4, 6, 8
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	2, 4, 6, 8
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	2, 4, 6, 8
Description of Asbestos Form	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	2, 4, 6, 8
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2, 4, 6, 8
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2, 4, 6, 8
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2, 4, 6, 8
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2, 4, 6, 8
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2, 4, 6, 8
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2, 4, 6, 8
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2, 4, 6, 8

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

Testing was completed on 06-Dec-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.

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