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Environmental Site Assessment:
Preliminary and Detailed Site Investigation to Support Structure Plan and Plan Change at

Coatesville - Riverhead Highway, Riverhead

Rev D **26 September 2023** **Job No. 21710**

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ENVIRONMENTAL SITE ASSESSMENT: PRELIMINARY AND DETAILED SITE INVESTIGATION TO SUPPORT STRUCTURE PLAN AND PLAN CHANGE AT COATESVILLE - RIVERHEAD HIGHWAY, RIVERHEAD, AUCKLAND

Job Number:	21710
Name of Project:	Coatesville – Riverhead Highway, Riverhead, Auckland
Client:	Fletcher Residential Ltd on behalf of Riverhead Landowner Group
Author:	Aaron Thorburn, Senior Environmental Advisor, BAppSc
Reviewer:	Zeljko Viljevac, Senior Hydrogeologist / Engineering Geologist, MSc Geology
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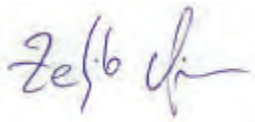
Reviewer Signature:	
Authoriser Signature:	

Executive Summary

Soil & Rock Consultants completed a desktop assessment and field investigation and prepared a Preliminary and Detailed Site Investigation to support a proposed Structure Plan and Plan Change Application at Coatesville - Riverhead Highway, Riverhead, Auckland.

Assessment of available information and observations from our site walkover indicate that Hazardous Activities and Industries List activities have, or potentially have, occurred at the site.

Soil samples were collected from across the site and analysed for Contaminants of Concern, including Heavy Metals, Organochlorine Pesticides, Total Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons and / or Asbestos. Laboratory analytical results reported:

- Heavy Metals concentrations in some shallow topsoil / fill materials samples located near identified areas of interest [sheds, garages, potential chemical storage or mixing areas or historical structures]) exceeded applicable Human Health and Environmental Discharge criteria,
- Asbestos was detected in some soil samples, with Fibrous Asbestos / Asbestos Fines concentrations above Asbestos Human Health Soil Guideline Values, and
- Heavy Metals concentrations were above Background Levels and / or Organochlorine Pesticides, Total Petroleum Hydrocarbons and / or Polycyclic Aromatic Hydrocarbons concentrations were above laboratory Method Detection Limits in most of the soil samples.

Based on these findings:

- Prior to earthworks or redevelopment, a site-specific Site Management Plan / Remediation Action Plan must be prepared for the site,
- Soil / fill material with Contaminants of Concern concentrations above applicable Human Health and / or Environmental Discharge criteria should be remediated,
- Any fill material / soil with Heavy Metals concentrations above Background Levels and / or Organic Contaminants of Concern concentrations above laboratory Method Detection Limits is not considered ‘Cleanfill’ for disposal purposes and must be disposed of at a facility licensed to accept materials,
- Prior to earthworks or redevelopment in the historical landfill area at 22 Duke Street, further assessment is required,
- Further delineation soil sampling is recommended on some properties prior to future redevelopment, and
- Any visual / olfactory evidence of contamination discovered during site works must be segregated and analysed prior to disposal.

Our findings, conclusion and recommendations are detailed in the following report and appendices.

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Appendices:

1.0 Introduction

Soil & Rock Consultants (S&RC) were engaged by Fletcher Residential Limited (FRL) on behalf of Riverhead Landowner Group [1] to undertake an Environmental Site Assessment (ESA) to support a proposed Structure Plan and Plan Change Application at Coatesville - Riverhead Highway, Riverhead, Auckland, the 'site' shown in Figure 1 below and in S&RC Drawing 21710 / 1 provided in Appendix A.

Figure 1: Site Location *(Source: Auckland Council GeoMaps Website)*

This report comprises a Preliminary and Detailed Site Investigation (PSI / DSI) prepared in accordance with Ministry for the Environment's (MfE) guidelines for contaminated site investigations, National Environmental Standard (NES) for contaminated sites and Auckland Council requirements. This investigation and reporting have been prepared, reviewed and authorised by Suitably Qualified and Experienced Practitioners (SQEP), as required under the NES.

1.1 Limitations

This report has been prepared by S&RC for the sole benefit of Fletcher Residential Limited on behalf of Riverhead Landowner Group (the client) with respect to the proposed Structure Plan and Plan Change Application at Coatesville - Riverhead Highway, Riverhead, Auckland and the brief given to us. This report may

[1] The Riverhead Landowner Group includes Fletcher Residential Limited, Matvin Group and The Neil Group.

be used by Auckland Council or their appointed Consultants, if required, and may be relied upon when considering a Resource Consent application in association with the proposed redevelopment.

The data and / or opinions contained in this report may not be used in other contexts or for any other purpose or by any other party without our prior review and agreement. This report may only be read or transmitted in its entirety, including the appendices.

1.2 Site Description

The subject properties that make up the site are legally described as:

- 30 Cambridge Road – Lot 1 DP 499822
- 1092 Coatesville–Riverhead Highway - Lot 2 DP 164590
- 1140 Coatesville–Riverhead Highway - Lot 1 DP 61985
- 1156 Coatesville–Riverhead Highway - Lot 1 DP 77992
- 1158 Coatesville–Riverhead Highway - Lot 2 DP 77992
- 1170 Coatesville–Riverhead Highway - Lot 3 DP 63577
- 1186 Coatesville–Riverhead Highway - Lot 2 DP 63577
- 1194 Coatesville–Riverhead Highway - Lot 1 DP 113506
- 1200 Coatesville–Riverhead Highway - Lot 1 DP 66488
- 22 Duke Street - Lot 20 DP 499876 (small southwest part of the property only)
- 51 Lathrope Road - Lot 1 DP 64605
- 306 Riverhead Road - Lot 1 DP 164978
- 307 Riverhead Road - Lot 2 DP 109763
- 325 Riverhead Road - Lot 1 DP 109763
- 328 Riverhead Road - Pt Lot 2 DP 37432
- 340 Riverhead Road - Pt Lot 2 DP 4818

The site covers an area of approximately 755,530m^2. Under the Auckland Unitary Plan Operative in part (AUP), the site is zoned ‘Future Urban Zone’.

The site is currently utilised for predominantly horticultural use, interspersed with some dwellings and associated structures and some larger cool-store facilities, particularly on the Riverhead Road frontage.

1.3 Proposed Development

The proposed Plan Change will re-zone the site to a mixture of residential, commercial and rural zones to enable urban development. As shown in Structure Plan drawings provided by Fletchers Residential Limited, shown below in Figures 2 and 3 and provided in 21710 / 2 in Appendix A.

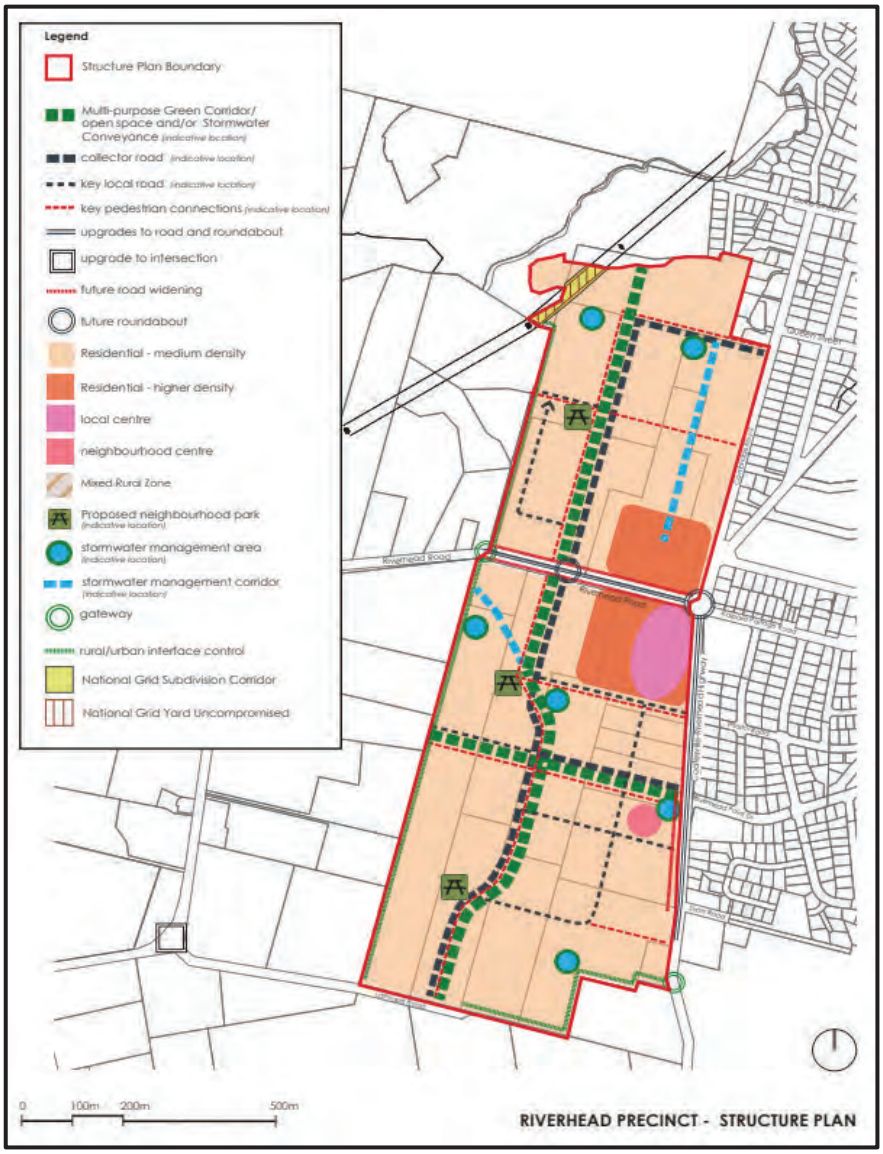

Figure 2: Riverhead Precinct – Structure Plan *(Source: Fletchers Residential Limited)*

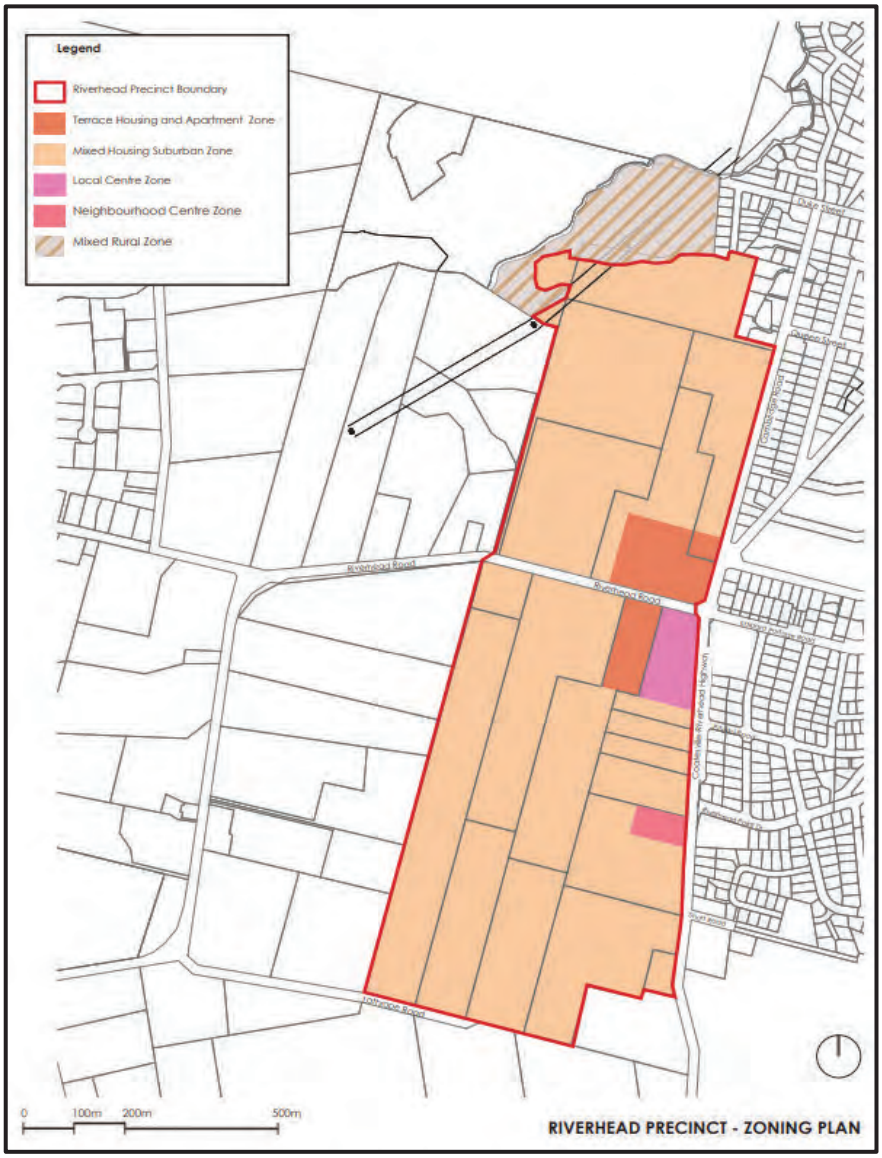

Figure 3: Riverhead Precinct – Zoning Plan *(Source: Fletchers Residential Limited)*

1.4 Project Scope

This investigation comprises a PSI / DSI, including the following:

- Site walkover,
- Review of available environmental investigation reports previously prepared for the site (or parts of the site),
- Review of historical aerial photographs, historical titles, Auckland Council Contamination Enquiry and Auckland Council Property Files,
- Collection and laboratory analyses of soil samples for identified Contaminants of Concern (CoC),
- Interpretation of laboratory analytical results, and
- PSI / DSI reporting (this report).

2.0 Site Information

2.1 Site Walkover

Site walkovers were undertaken on individual properties between January and April 2022. Photographs from the site walkovers are provided in Appendix B. The following was observed on the site:

- The site is located immediately west of the of the Riverhead township,
- Site access is from Cambridge Road, Duke Street and Coatesville-Riverhead Highway to the east, Riverhead Road to the north and south and Lathrope Road to the south,
- Built development comprises dwellings and associated structures, some larger sheds and commercial type structures are visible across the site as are shadehouses in the north-western part of the site,
- The site surface is predominantly altered for horticultural use, grasslands are visible to the north and south-eastern parts of the site,
- Rubbish piles were observed at the Cambridge Road site, with general household type refuse and tyres observed,
- Chemical containers were visible from the site walkover at some of the properties, particularly 20 litre containers and predominantly observed at those sites that are still utilising the land for horticultural use, the names of the products could not be determined or the amount of the liquid held within,
- The Riverhead War Memorial Park is approximately 200m to the east of the site, and
- The nearest water course is an unnamed stream approximately 10m north the site at the closest point.

2.2 Geology, Surface Water and Groundwater

According to the GNS Science New Zealand Geology Web Map, 1:250,000 Scale, the site is underlain by the Puketoka Formation alluvial deposits of the Tauranga Group.

Alluvial soils are often susceptible to consolidation (resulting in settlement) when subjected to foundation or fill loads, particularly where organic soils are present. In addition, these soils shrink and swell with soil moisture content changes and can be sensitive, often rapidly losing strength in response to disturbance by construction plant and/or exposure to the elements.

A geologic map of the site and surrounding area is provided in Figure 4 below.

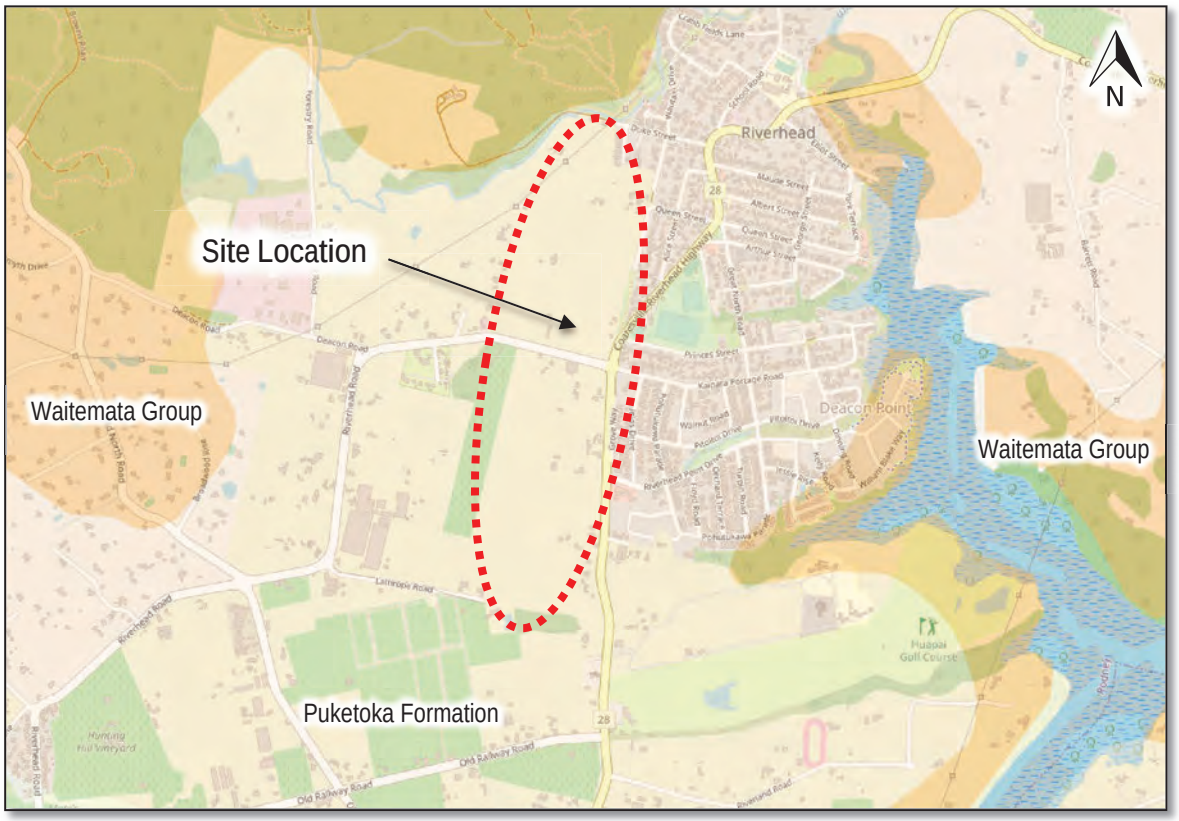

Figure 4: Geological Map *(Source: GNS WebMaps Website)*

During S&RC's geotechnical investigation completed between January – April 2022, topsoil was encountered across the majority of the site from the ground surface to a maximum encountered depth of 1.9m below ground level (bgl), however topsoil generally ranged in depths between 0.2m and 0.4m bgl.

Fill was present within parts of the site, either from the ground surface or below the topsoil layer. Fill depths generally ranged between 0.3m bgl and 1.7m bgl apart from several locations within the property at 22 Duke Street, where the fill could not be penetrated using hand augering equipment (maximum reach 5m) and therefore the fill thickness was not ascertained. Review of historic aerial photographs in this area shows evidence of past tipping.

The topsoil and fill are underlain by alluvial deposits of the Puketoka Formation (Ref. 21640, *Preliminary Geotechnical Investigation to Support Structure Plan and Plan Change, Coatesville Riverhead Highway, Riverhead*, Rev. C, 19 September 2023).

The nearest surface water to the site is an unnamed stream, located immediately north of the site at the closest point. The unnamed stream flows to the north-east, discharging into the Rangitopuni Stream at the western reaches of the Waitemata Harbour.

The site surface and surrounding area is generally flat, with a gradual slope upwards to the west and northwest of the site towards the Riverhead Forest. According to the Auckland Council GeoMaps website, there is an Overland Flow Path (OLFP) approximately 60m west of the site that is fed from smaller OLFPs across the southern part of the site. The smaller OLFP in the northern part of the site flows to the north into the unnamed stream on the site's northern boundary.

Surface water runoff from the site is anticipated to flow to the direction towards the OLFP features to the north to north-west or towards the open trench drains on the nearby road carriageways.

During S&RC's geotechnical investigation completed in between January and April 2022, groundwater was encountered beneath the site between 0.8m bgl and 3.3m bgl. Based on the site and surrounding topography, groundwater flow direction beneath the site is anticipated to be towards the east towards the Rangitopuni Stream and the Waitemata Harbour.

3.0 Previous Environmental Investigations

In November 1992 and February 1993, Kingett Mitchell & Associates Environmental Consultants Limited undertook an Environmental Assessment for 22 Duke Street (Ref. *Kingett Mitchell & Associates Ltd, Environmental Assessment – Lot 2 DP 103840, 18 Duke Street,* November 1992, updated February 1993). The Environmental Assessment identified the approximate location of a landfill containing construction and demolition debris (wood, sawdust, shavings and demolition timber and materials) and minor household waste located in the south-western part of 22 Duke Street (identified as 18 Duke Street in the report). The assessment further identified that leachate from the landfill had impacted the Waitaiti Stream, located along western site boundary site. Elevated concentrations of total ammonia, chemical oxygen demand, zinc and iron were detected in Waitaiti Stream. It was identified that mitigation measures to be put in place including proper capping, wetland modification and further monitoring.

In December 2015, Geosciences Limited undertook a Due-Diligence Investigation at 307 and 325 Riverhead Road (Ref. Ltr-0743 / Dec 15, *Due-Diligence Investigation of 307 and 325 Riverhead Road, Riverhead*, 7 December 2015). The Due-Diligence Investigation identified that both properties have historically been utilised for pastural and horticultural use, low level contamination associated with historical horticultural land use was detected at the 307 Riverhead Road property. No contamination was reported at the 325 Riverhead Road property.

In September 2018, Focus Environmental Services Limited undertook a DSI at 306 & 328 Riverhead Road and unnamed properties on Lathrope Road (referred to as Pooks Blocks), (Ref. FES 1139.001, *Detailed Site Investigation, Pooks Blocks, Riverhead, Auckland,* October 2018). The DSI identified that historical horticultural use has impacted the soil across the site. Elevated concentrations of Heavy Metals, Organochlorine Pesticides (OCP), Polycyclic Aromatic Hydrocarbons (PAH) and Asbestos fibres were detected. Sample results from the Focus Environmental DSI are presented below in Section 11.

In March 2021, Geosciences Limited undertook a Preliminary Soil Contamination Assessment for 1092 Coatesville-Riverhead Highway (Ref. Mem-1575 / Mar-21, *Preliminary Soil Contamination Assessment for 1092 Coatesville-Riverhead Highway,* 15 March 2021). The Preliminary Soil Contamination Assessment identified that the site has historically been utilised for pastural and horticultural use, it was identified that Hazardous Activities and Industries List (HAIL) activities had been carried out on the site and that further assessment should be undertaken to delineate any possible contamination impacts on the site.

4.0 Historical Information

The history of the site was established through a review of historical aerial photographs, a review of Land Information New Zealand (LINZ) certificates of title, a search of Auckland Council contamination incident files, and a search / request of the Auckland Council property files.

4.1 Historical Aerial Photography

Historical aerial photographs of the site were obtained from *Retrolens* website (http://retrolens.nz/Map/) and Auckland Council Geomaps platform (https://geomapspublic.aucklandcouncil.govt.nz). Photographs available for the subject area are dated from 1940 to 2017. Aerial photograph assessments are included in Table 1 below and aerial photographs are provided in Appendix C.

Table 1: Historical Aerials

Date	Source	Description
1940	Retrolens	• The site is predominantly pasture with some horticultural land-use visible to the south of Riverhead Road (Riverhead Road runs east-west through the middle of the site), dwellings and associated structures are visible spread out across the site, • Riverhead Forest is immediately north of the site, • Cambridge Road, Duke Street and Lathrope Roads are not visible, and • The surrounding area is predominantly pastureland with some horticultural land-use visible to the east and west of the site, dwellings and associated structures are spread out to the east and west.
1963	Retrolens	• New dwellings and / or associated structures are visible along Riverhead Road and the southeast part of the site along Coatesville-Riverhead Highway (runs north / south on the eastern boundary of the site), • Horticultural land-use is visible on the southern part of the site with the entire section modified from pasture, • Residential expansion visible to the east of the site (Riverhead Township), and • Horticultural land to the west of the site has been replaced with pastureland.
1973	Retrolens	• New dwellings and / or structures are visible along the southeast part of the site along Coatesville-Riverhead Highway, • Further residential expansion visible to the east of the site, • Increased horticultural land-use visible to the east, west and south of the site, • Industrial operations are visible approximately 700m to the west of the site (Forestry Road), and • Duke Street and Lathrope Roads are visible.
1988	Retrolens	• Horticultural land-use is visible on the northern part of the site (north of Riverhead Road), new dwellings and / or structures are visible at the northern (Duke Street) and southern (Lathrope Road) boundaries, • Further residential expansion visible to the east of the site, • Horticultural land-use visible to the east, west and south of the site, and • Cambridge Road is visible.
1996	Auckland Council	• The site is similar to the 1988 image, • Riverhead Forest immediately north of the site has been harvested, and • The surrounding area is similar to the 1988 image.
2010	Auckland Council	• The middle northwest section of the site has had shelterbelts removed and appears to be undergoing a change from former land-use, • Riverhead Forest immediately north of the site has been re-planted, • Large structures (commercial / industrial) are visible in the horticultural areas to the east and west of the site.
2017	Auckland Council	• The middle northwest section of the site has been redeveloped for horticulture use with shadehouses constructed, and • The horticulture area to the east of the site has been redeveloped with residential dwellings.

The most recent aerial photograph was sourced from Auckland Council and is dated 2017. Site conditions observed in the 2017 image are similar to those observed during the January to April 2022 site walkovers.

4.2 Certificates of Title

From available information held by LINZ:

30 Cambridge Road

- The Original Registered Owner (11 July 2016) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 12 May 2017.

1092 Coatesville–Riverhead Highway

- The Original Registered Owner (13 February 1995) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 7 March 2013.

1140 Coatesville–Riverhead Highway

- The Original Registered Owner (24 March 1970) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 29 October 2018.

1156 Coatesville–Riverhead Highway

- The Original Registered Owner (26 February 1976) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 15 November 2007.

1158 Coatesville–Riverhead Highway

- The Original Registered Owner (26 February 1976) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 30 October 2020.

1170 Coatesville–Riverhead Highway

- The Original Registered Owner (3 September 1970) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 6 August 2012.

1186 Coatesville–Riverhead Highway

- The Original Registered Owner (3 September 1970) for the site is listed as [redacted], and
- The site was transferred to [redacted] (current owner) on 10 July 2020.

1194 Coatesville–Riverhead Highway

- The Original Registered Owner (10 June 1987) for the site is listed as [redacted]
- The site was transferred to [redacted] (current owner) on 5 June 2009.

1200 Coatesville–Riverhead Highway

- The Original Registered Owner (25 February 1972) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 23 February 1995.

22 Duke Street

- The Original and Current Registered Owner (10 February 2017) for the site is listed as [redacted]

51 Lathrope Road

- The Original Registered Owner (22 April 1971) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 28 September 2017.

306 Riverhead Road

- The Original and Current Registered Owner (30 March 1995) for the site is listed as [redacted]

307 Riverhead Road

- The Original Registered Owner (22 April 1986) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 30 June 2017.

325 Riverhead Road

- The Original Registered Owner (22 April 1986) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 1 April 2016.

328 Riverhead Road

- The Original Registered Owner (22 April 1971) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 16 April 2012.

340 Riverhead Road

- The Original Registered Owner (22 April 1971) for the site is listed as [redacted] and
- The site was transferred to [redacted] (current owner) on 15 February 2013.

Copies of the Certificates of Title are provided in Appendix D.

4.3 Auckland Council Contamination Enquiry

A site contamination enquiry was requested from Auckland Council. Information obtained from their databases relates to incidents files and records of pollution incidents.

Potential HAIL for the site identified in the Contamination Enquiry are provided in Table 2 below:

Table 2: Auckland Council Contamination Enquiry Potential HAIL Activities

Potential HAIL Activity	Potential HAIL Category
Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds	A.10
Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances	F.8
Landfill sites	G.3
Waste disposal to land (excluding where biosolids have been used as soil conditioners)	G.5

- Auckland Council records indicate that 1092, 1140, 1156, 1170, 1186, 1194 Coatesville – Riverhead Highway, 51 Lathrope Road and 306, 307, 325, 328, 340 Riverhead Road have been utilised for horticultural activities,
- Auckland Council records indicated that 1200 Coatesville – Riverhead Highway has been utilised for depot activities,
- Aerial images indicate that 30 Cambridge Road may have been utilised for horticultural activities and open burning has taken place on the site, and
- Auckland Council records indicate that since the mid-1970s until the mid-1990s, part of 22 Duke Street has been utilised for landfilling activities. The landfill area is approximately 5,000m^2 in size. Material placed in the landfill includes construction waste and debris from the Riverhead Timber Mill, between 2005-2020 further disposal to land occurred, including but not limited to concrete rubble, general waste, treated timber and tyres. Leachate discharge sampling undertaken by Auckland Council indicated low levels of Nickel, Cadmium and Zinc.

Additional potential sources of contamination at the site identified in the Contamination Enquiry are summarised in Table 3 below:

Table 3: Auckland Council Contamination Enquiry Potential Sources of Contamination

Potential Source of Contamination	Potential HAIL Category
Potential Asbestos in building materials in historical buildings	E.1
Potential Lead-based paint on site structures / historical buildings	I

Further information was provided relating to records of pollution incidents, bores, contaminated site and air discharges and industrial trade process consents, closed landfills and air quality permitted activities within approximately 200m of the site.

The following Consents / Permitted Activities have been issued for properties within approximately 200m of the site, summarised in Table 4 below:

Table 4: Auckland Council Contamination Enquiry – Consents / Permitted Activities within 200m of the Site

Address	Date	Consent Type	Proximity to Site	Description
1064 Coatesville-Riverhead Highway, Riverhead	2 June 2017	Discharge Consent (51514)	194m east of the site	To discharge contaminants from a former sawmill site and timber yard.
1087 Coatesville-Riverhead Highway, Riverhead	5 October 2012	Groundwater Take Consent (38552)	110m east of the site	To take and use groundwater for use on sports field, playcentre and public toilet amenities.
1090 Coatesville-Riverhead Highway, Riverhead	28 September 1999	Stormwater Discharge Consent (22996)	40m east of the site	To divert and discharge stormwater and forecourt washings from an environmental upgrade of the service station (Z Riverhead)
1135 Coatesville-Riverhead Highway, Riverhead	16 March 2015	Bore Consent (44233)	40m east of the site	Construction of one bore for domestic purposes.
1156 Coatesville-Riverhead Highway, Riverhead	12 July 2016	Groundwater Take Consent (45346)	-	To take and use groundwater for irrigation of outdoor and glasshouse crops.
1197 Coatesville-Riverhead Highway, Riverhead	6 May 2016	Groundwater Take Consent (45232)	30m east of the site	To take and use groundwater for irrigation of outdoor and glasshouse crops.
Lathrope Lane	21 December 1987	Bore Consent (10311)	~ 250m west of the site	Construction of one bore to an approximate depth of 250m. Purpose of the bore is not provided.
27 Lathrope Road, Riverhead	18 February 1998	Bore Consent (21074)	180m west of the site	Construction of bore for irrigation purposes.
	29 April 2016	Groundwater Take Consent (45233)		To take and use groundwater for irrigation of market garden crops.
Lathrope Road	31 May 1988	Bore Consent (10391)	± 250m west of the site	Construction of one bore to an approximate depth of 58m. Purpose of the bore is not provided.
Lathrope Road	31 May 1988	Bore Consent (10392)		Construction of one bore to an approximate depth of 12m. Purpose of the bore is not provided.

Lathrope Road	18 September 1992	Bore Consent (11061)		Construction of one bore to an approximate depth of 250m. Purpose of the bore is not provided.
210 Riverhead Road, Riverhead	2 June 2017	Bore Consent (52998)	192m east of the site	Construction of one replacement bore to an approximate depth of 180-220m for irrigation purposes.
	11 March 2015	Groundwater Take Consent (42498)		To take and use groundwater for irrigation of 1.2ha of glasshouse crops.
306 Riverhead Road, Riverhead	15 February 2016	Groundwater Take Consent (36991)	-	To take and use groundwater for irrigation of Kiwifruit orchard.
307 Riverhead Road, Riverhead	21 November 1988	Bore Consent (10473)	-	Construction of one bore to an approximate depth of 220m. Purpose of the bore is not provided.
	29 April 2016	Groundwater Take Consent (45252)		To take and use groundwater for irrigation of orchard and glasshouse crops.
340 Riverhead Road, Riverhead	12 April 2013	Bore Consent (41534)	-	Construction of one bore to an approximate depth of 300m for irrigation purposes.
	3 October 2013	Groundwater Take Consent (41571)		To take and use groundwater for irrigation of strawberry market garden.

The following pollution incidents were reported for locations within approximately 200m of the site in Table 5 below:

Table 5: Auckland Council Contamination Enquiry – Pollution incidents within 200m of the site

Reference	Activity	Location	Proximity to Site
1/10/2083 (16 June 2010)	Dirt / Sediment (approximately < 10 L) into stream causing discolouration	1230 Coatesville – Riverhead Highway, Riverhead	200m south of the site
1/12/3103 (29 August 2012)	Wastewater overflow (volume unknown) into stormwater system	3 Kaipara Portage Road, Riverhead	75m east of the site

A copy of the Contamination Enquiry is attached in Appendix E.

4.4 Auckland Council Property File

Information obtained from Auckland Council relates to Resource Consents and Building Consents / Permits issued for developments that have occurred on-site.

Property File requests were lodged with Auckland Council. Relevant information from the Property Files is summarised in Table 6 and are provided on request (large amount of files).

Table 6: Property File

Date	Document	Owner / Applicant	Description
30 Cambridge Road			
04.08.1975	Building Permit Application	[redacted]	Construction of a hay barn.
30.11.1979	Building Permit Application	[redacted]	Construction of a garage / workshop
22.05.1985	Building Permit Application	[redacted]	Re-siting a dwelling to the property
15.12.1998	Building Consent Application	[redacted]	Additions to existing residential dwelling
08.01.1990	Building Permit Application	[redacted]	Construction of a garage / loft
03.12.2014	Geotechnical Investigation Report	[redacted]	Geotechnical Investigation carried out for two proposed silo sheds
27.07.2015	Building Consent Application	[redacted]	Construction of two sheds for workshop and storage space
1092 Coatesville-Riverhead Highway			
26.09.1972	Building Permit Application	[redacted]	Construction of a garage and store shed
08.05.1984	Building Permit Application	[redacted]	Re-siting a dwelling to the property
10.10.1986	Building Permit Application	[redacted]	Re-siting a double garage to be used on orchard
22.03.1994	Resource Consent Application	[redacted]	Horticultural subdivision of main property
1140 Coatesville-Riverhead Highway			
14.12.1971	Building Permit Application	[redacted]	Construction of a garage and implement shed
08.05.1974	Building Permit Application	[redacted]	Construction of a packing shed
24.08.2009	Building Consent	[redacted]	Addition of bedrooms and bathroom to existing dwelling and carport
1156 Coatesville-Riverhead Highway			
12.09.1972	Building Permit Application	[redacted]	Construction of a residential dwelling
03.09.1973	Building Permit Application	[redacted]	Construction of dwelling garage

01.03.1977	Building Permit Application	[redacted]	Construction of a glasshouse
02.03.1979	Building Permit Application	[redacted]	Construction of a garage
01.08.1979	Building Permit Application	[redacted]	Addition to existing dwelling
24.07.1981	Building Permit Application	[redacted]	Construction of a swimming pool
02.06.2015	Geotechnical Investigation Report	[redacted]	Geotechnical Investigation carried out for the construction of a shed with awning
30.09.2015	Building Consent	[redacted]	Construction of Shed with awning
1158 Coatesville-Riverhead Highway			
04.08.1977	Building Permit Application	[redacted]	Construction of a residential dwelling
16.09.1981	Building Permit Application	[redacted]	Construction of shade house
29.04.1999	Resource Consent – Water Take	[redacted]	Consent sought to take groundwater for irrigation purposes
09.09.2007	Building Consent Application	[redacted]	Construction of a swimming pool
09.09.2007	Geotechnical Investigation	[redacted]	Geotechnical Investigation carried out for the construction of a swimming pool
1170 Coatesville-Riverhead Highway			
05.09.1972	Building Permit Application	[redacted]	Addition to dwelling carport
03.03.1976	Building Permit Application	[redacted]	Construction of a storage packing shed
09.11.1977	Building Permit Application	[redacted]	Addition to existing dwelling
21.11.2012	Geotechnical Investigation Report	[redacted]	Geotechnical Investigation carried out for the construction of shed and offices
11.03.2013	Building Consent Application	[redacted]	Construction of shed and offices
10.09.2018	Building Consent Application	[redacted]	Construction of a swimming pool
1186 Coatesville-Riverhead Highway			
06.08.1970	Building Permit Application	[redacted]	Construction of a residential dwelling

06.10.1975	Building Permit Application	[redacted]	Construction of garage and storage space
1194 Coatesville-Riverhead Highway			
17.01.1994	Building Consent Application	[redacted]	Construction of stable / storage shed
12.07.1995	Building Consent Application	[redacted]	Re-siting a dwelling to the property
200 Coatesville-Riverhead Highway			
08.09.1976	Building Permit Application	[redacted]	Construction of a carport to existing garage
28.08.1978	Building Permit Application	[redacted]	Construction of an implement shed
26.08.1986	Planning Consent Application	[redacted]	Consent sought to operate an agricultural contractors business from the property
09.12.1986	Building Permit Application	[redacted]	Alterations to existing dwelling
06.09.1989	Building Permit Application	[redacted]	Additions to existing workshop / garage
51 Lathrope Road			
08.09.1980	Building Permit Application	[redacted]	Construction of a packing shed with living accommodation
01.04.1987	Building Permit Application	[redacted]	Re-siting a house to the property
15.04.1988	Building Permit Application	[redacted]	Construction of a storage shed
July 2005	Geotechnical Investigation and Engineering Report	[redacted]	Investigation to ensure that the proposed house site is stable and suitable for building
20.02.2006	Building Consent Application	[redacted]	Construction of a private dwelling
306 Riverhead Road			
01.07.1957	Building Permit Application	[redacted]	Addition to existing dwelling and garage
03.09.1973	Building Permit Application	[redacted]	Construction of a garage and implement shed
20.05.1994	Proposed Subdivision proposal	[redacted]	Proposal to subdivide the dwelling site from the 9.35ha landholding

20.09.2001	Resource Consent Application	[redacted]	Extension to existing dwelling
307 Riverhead Road			
17.04.2002	Resource Consent Application	[redacted]	Re-siting a house to the property
30.08.2003	Building Consent Application	[redacted]	Construction of a vehicle shelter
30.04.2013	Building Consent	[redacted]	Construction of a greenhouse
29.06.2015	Resource Consent Application – Water Take	[redacted]	Consent sought to take groundwater for irrigation purposes
325 Riverhead Road			
01.12.1980	Building Permit Application	[redacted]	Construction of a private dwelling
16.05.1986	Building Permit Application	[redacted]	Construction of an implement shed / hay barn
12.03.1987	Building Permit Application	[redacted]	Construction of a garage off the end of the existing dwelling
27.04.2005	Building Consent Application	[redacted]	Construction of a half-round barn
09.08.2005	Resource Consent Application	[redacted]	Convert existing dwelling into visitor accommodation and build new dwelling for the site owner.
328 Riverhead Road			
14.01.1957	Building Permit Application	[redacted]	Additions to existing dwelling
07.05.1958	Building Permit Application	[redacted]	Construction of a storage shed
23.06.1970	Building Permit Application	[redacted]	Construction of an implement shed
26.10.1977	Building Permit Application	[redacted]	Construction of an implement shed
340 Riverhead Road			
03.02.1964	Building Permit Application	[redacted]	Alterations to existing dwelling
11.08.1967	Building Permit Application	[redacted]	Addition to existing shed, away from residential dwelling

11.02.1972	Building Permit Application	[redacted]	Construction of a garage
19.12.1975	Building Permit Application	[redacted]	Construction of an implement shed
03.05.1981	Building Permit Application	[redacted]	Additions to existing garage
20.03.2013	Bore Permit Application	[redacted]	Bore permit application to support the take of groundwater for irrigation purposes
18.02.2014	Building Consent	[redacted]	Construction of implement shed
30.07.2014	Building Consent Application	[redacted]	Extension to existing shed and change of use to a packhouse, office and room for gate sales

5.0 Summary of Previous Activities and Land Use

Based on previous land use and development information for the property, Table 7 summarises the potential for contamination associated with previous site activities and land uses classified under the HAIL.

Table 7: Site Activities / Land Uses and Potential HAIL Categories

Time Frames	Primary Source	Activity / Land Use	Potential HAIL Category
c. 1940 - present	Walkover, Previous Reports, Aerial Photographs, Property File	Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds	A.10
c. 1940 - present	Walkover, Previous Reports, Aerial Photographs, Property File	Potential contamination from possible Asbestos / ACM in historical buildings	E.1
c. 1990s	Previous Reports, Contamination Enquiry	Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances	F.8
1970s – present	Previous Reports, Contamination Enquiry	Landfill sites	G.3
1970s – 2020	Previous Reports, Contamination Enquiry	Waste disposal to land	G.5
c. 1940 - present	Walkover, Aerial Photographs, Property File	Potential contamination from possible Lead-based paint use on historical buildings.	I
c. 1940 - present	Walkover, Previous Reports, Aerial Photographs, Property File	Undocumented fill	I

5.1 Landfilling Activities

Historical landfilling was undertaken at a part of the 22 Duke Street property from the 1970s until the mid-1990s. Auckland Council records state that the landfill has an area of approximately 5,000m^2 and material placed in the landfill includes construction waste and debris from the Riverhead Timber Mill (approximately 760m west of the 22 Duke Street property), as well as minor household waste.

Between 2005 to 2020 further disposal to land occurred, including but not limited to concrete rubble, general waste, treated timber and tyres. The S&RC Geotechnical report (Ref. 21640, *Preliminary Geotechnical Investigation to Support Plan Change, Coatesville-Riverhead Highway, Riverhead*, May 2022) confirms fill on the property between 0.3m – 1.7m below ground level and may be deeper due to auger refusal on gravel material and that fill material will require removal for subdivision earthworks, unless the material is suitable for reuse.

Investigations undertaken at 22 Duke Street to date are limited with only high-level scheme plans available for the site with no specific information on which to base a more detailed assessment. Further assessment regarding the landfill area, volume and associated contaminants of the historical landfill area must be completed during development planning of the property prior to Resource Consent and that contaminated fill material must be remediated prior to any future residential redevelopment of the site.

6.0 National Environmental Standard Regulations

The proposed redevelopment will comprise site works where soils will be disturbed and potentially transported to another location. Based on the historical information for the site, activities, that have or may have occurred at the site are classified as HAIL activities. As such, the site would be covered under the NES Regulations.

7.0 Soil Contamination Investigation

7.1 Identified Contaminants of Concern

The site was identified for potential soil contamination during the review of historical documents and S&RC's January – April 2022 site walkovers. Of relevance to the site history, it was concluded that potential CoC for the site included:

- Heavy Metals,
- OCP,
- Total Petroleum Hydrocarbons (TPH),
- PAH, and / or
- Asbestos.

7.2 Soil Investigation

Soil sampling was completed at the site over several days between January 2022 and April 2022. A total of 92 soil samples were collected, including:

- 60 shallow topsoil / fill materials samples across the former horticultural area, which were generally composited into composite soil samples, with four original soil samples per one composite soil sample (designated with 'CS' in Table 7 below),
- Eight deeper natural soil samples collected from across the former horticultural areas,
- 20 shallow topsoil / fill material samples collected near point of interest, including sheds, garages, potential chemical storage or mixing areas and historical structures, and
- Four duplicate soil samples, which were composited into one composite soil sample (CS101) and collected and analysed for Quality Assurance / Quality Control (QA / QC) purposes.

Soil samples were submitted to the laboratory (Eurofins) for analysis of Heavy Metals, OCP, TPH, PAH and / or Asbestos.

Additionally, one building material sample identified as potential Asbestos Containing Material (ACM) was collected and submitted to the laboratory (Eurofins) for Asbestos analysis.

Soil samples have not been collected from the 1170 Coatesville – Riverhead Highway property at the date of this document as access has not been granted. Soil sampling and analysis for CoC must be completed at 1170 Coatesville – Riverhead Highway and that any contaminated soil must be remediated prior to any future residential redevelopment of the site. S&RC proposed to complete soil sampling and analysis of 1170 Coatesville – Riverhead Highway during development planning of the property at the Resource Consent application stage.

Soil and potential ACM sampling details are described in Tables 8 and 9, respectively. The S&RC Sample Location Plan is provided in Appendix F. Photographic documentation from the investigation is provided in Appendix B.

Table 8: Sample Descriptions - Soil

Sample ID		Date	Depth (m bgl)	Soil Description	Analyses Performed
30 Cambridge Road					
CS04	S04-1	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S04-2	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S04-3	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S04-4	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP

S04-2D		28 February 2022	0.5	Natural, SILT	Heavy Metals, OCP
CS05	S05-1	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S05-2	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S05-3	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S05-4	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
S29		28 February 2022	0.1	Fill, Sandy SILT	OCP, TPH, PAH, Asbestos
1140 Coatesville Riverhead Highway & 340 Riverhead Road					
CS13	S13-1	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
	S13-2	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
	S13-3	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S13-4	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
S13-4D		28 February 2022	0.8	Natural, SILT	Heavy Metals, OCP
CS14	S14-1	28 February 2022	0.1	Topsoil/Fill, SILT	Heavy Metals, OCP
	S14-2	28 February 2022	0.1	Topsoil/Fill, SILT	Heavy Metals, OCP
	S14-3	28 February 2022	0.1	Topsoil/Fill, SILT	Heavy Metals, OCP
	S14-4	28 February 2022	0.1	Topsoil/Fill, SILT	Heavy Metals, OCP
CS101	S101-1	28 February 2022	0.1	Duplicate of S14-1	Heavy Metals, OCP
	S101-2	28 February 2022	0.1	Duplicate of S14-2	Heavy Metals, OCP
	S101-3	28 February 2022	0.1	Duplicate of S14-3	Heavy Metals, OCP
	S101-4	28 February 2022	0.1	Duplicate of S14-4	Heavy Metals, OCP
CS15	S15-1	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S15-2	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S15-3	28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP
	S15-4	28 February 2022	0.1	Topsoil/Fill, SILT	Heavy Metals, OCP
S15-4D		28 February 2022	0.8	Natural, SILT	Heavy Metals, OCP
CS16	S16-1	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
	S16-2	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
	S16-3	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
	S16-4	28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP
CS18	S18-1	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S18-2	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S18-3	28 February 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S18-4	28 February 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
S18-2D		28 February 2022	0.8	Natural, Sandy SILT	Heavy Metals, OCP
S36		28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S37		28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S41		28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S58		28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, Asbestos
S59		28 February 2022	0.1	Fill, Sandy SILT	Heavy Metals, Asbestos
S60		28 February 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, Asbestos

1156 & 1158 Coatesville Riverhead Highway					
CS19	S19-1	1 March 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S19-2	1 March 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S19-3	1 March 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S19-4	1 March 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
S38		1 March 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S39		1 March 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S40		1 March 2022	0.1	Topsoil/Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S61		1 March 2022	0.1	Fill, Sandy SILT	Heavy Metals, Asbestos
1170 Coatesville Riverhead Highway (assess not granted for S&RC to undertake soil sampling)					
1186 Coatesville Riverhead Highway					
CS23	S23-1	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S23-2	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S23-3	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S23-4	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
CS24	S24-1	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S24-2	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S24-3	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
	S24-4	10 January 2022	0.1	Topsoil, Silty SAND	Heavy Metals, OCP
S24-2D		10 January 2022	0.8	Natural, Clayey SILT	Heavy Metals, OCP
1194 Coatesville Riverhead Highway					
CS25	S25-1	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S25-2	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S25-3	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S25-4	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
CS26	S26-1	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S26-2	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S26-3	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S26-4	4 April 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
S25-2D		4 April 2022	0.8	Natural, Clayey SILT	Heavy Metals, OCP
S46		4 April 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH
S47		4 April 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S64		4 April 2022	0.1	Fill, Sandy SILT	Heavy Metals, Asbestos
1200 Coatesville Riverhead Highway					
S47		1 March 2022	0.1	Fill, Sandy SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S65		1 March 2022	0.1	Fill, Sandy SILT	Heavy Metals, Asbestos
S66		1 March 2022	0.1	Natural, Sandy SILT	Heavy Metals, Asbestos
51 Lathrope Road					
CS21	S21-1	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S21-2	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP

	S21-3	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S21-4	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
S21-3D		17 January 2022	0.8	Natural, SILT	Heavy Metals, OCP
CS22	S22-1	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S22-2	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S22-3	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
	S22-4	17 January 2022	0.1	Topsoil, SILT	Heavy Metals, OCP
S43		17 January 2022	0.1	Fill, Gravelly SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S44		17 January 2022	0.1	Fill, Gravelly SILT	Heavy Metals, OCP, TPH, PAH, Asbestos
S45		17 January 2022	0.1	Topsoil, SILT	Heavy Metals, TPH, PAH, Asbestos
22 Duke Street					
CS01	S01-1	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S01-2	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S01-3	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
	S01-4	28 February 2022	0.1	Topsoil, Sandy SILT	Heavy Metals, OCP
S01-2D		28 February 2022	0.8	Natural, SILT	Heavy Metals, OCP

ID = Identifier
m bgl = metres below ground level
PAH = Polycyclic Aromatic Hydrocarbons
CS = Composite Sample
OCP = Organochlorine Pesticides
TPH = Total Petroleum Hydrocarbons

Table 9: Sample Descriptions – Potential ACM

Sample ID	Date	Depth (m bgl)	Description	Analyses Performed
1140 Coatesville Riverhead Highway & 340 Riverhead Road				
ASB-1	28 February 2022	0.0	Potential ACM Building Material	Asbestos

7.3 Soil Sampling Protocol

Soil samples were collected using a hand auger. Soil sampling equipment was decontaminated between sampling locations and disposable nitrile gloves were used and replaced between sampling locations in order to prevent cross contamination. All samples were collected in accordance with strict environmental sampling protocols to ensure reliable and representative results.

All sample containers and preservatives, where applicable, were supplied by the subcontract laboratory and were consistent with the specifications provided in Section 6.4 – Sample Handling, of the Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils (MfE, Revised 2021). All samples were labelled with unique identifiers indicating the sampling location. Samples were couriered directly to the laboratory (Eurofins) under continuous Chain of Custody (COC) documentation. Each COC form had a unique laboratory number.

8.0 Regulations

Within the Auckland Region, investigations of contaminated and potentially contaminated sites are governed by rules under:

- MfE NES and Petroleum Hydrocarbon Guidelines (PHG) – National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (MfE, 2021) and Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE, revised 2011),
- AUP – Auckland Unitary Plan (2023), and
- New Zealand Guidelines for Assessing and Managing Asbestos in Soil (Building Research Association New Zealand (2017).

While part of our report assesses potential planning and Resource Consent requirements from relevant authorities, these sections are provided for reference only. Guidance / clarification should be sought from an Environmental Planning Specialist.

8.1 National Environmental Standard – Contaminants in Soil

The Resource Management Regulations 2011, National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) came into force on 1 January 2012, with Contaminated Land Management Guidelines revised in 2011 (No. 2) and 2021 (No. 1 and 5). The NES for contaminants in soil incorporates by reference MfE contaminated land documents, including MfE Contaminated Land Management Guidelines for the investigation, assessment and reporting of contaminated land within New Zealand. These documents are aimed to provide national consistency in the reporting of contaminated site information. These documents are:

- Contaminated Land Management Guidelines (No. 1, 2 and 5),
- HAIL,
- Methodology of Deriving Soil Guideline Values Protective of Human Health, and
- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand.

Copies of the above guideline documents are available at www.mfe.govt.nz.

8.2 Auckland Unitary Plan

The AUP is Auckland's key resource management document under the Resource Management Act (RMA, 1991). Matters relating to contaminated land can be referred from:

- Regional Policy Statement (B10.4 Land – Contamination), and
- Chapter E Auckland-wide, Environmental Risk (E.30 Contaminated Land).

8.3 New Zealand Guidelines for Assessing and Managing Asbestos in Soil

The New Zealand Guidelines for Assessing and Managing Asbestos in Soil were published in 2017. The guidelines provide direction around identifying, assessing and managing Asbestos in soil in New Zealand and establish Human Health Soil Guideline Values (SGV).

9.0 Assessment Criteria

The site is zoned 'Future Urban Zone' and the proposed Structure Plan and Plan Change Application will enable urban development. For this assessment, soil analytical results were compared against:

- NES Human Health criteria for Residential and High-Density Residential use,
- PHG Human Health criteria for Residential use, and
- Asbestos SGV for Residential and High-Density Residential sites.

Due to the Tauranga Group sediments mapped and encountered beneath the site, soil analytical results were also compared against:

- Auckland Region Background Levels for Non-Volcanic soils.

10.0 Analytical Results – Soil and Rock Consultants (DSI, 2022)

S&RC collected a total of 92 individual soil samples (64 soil samples [shallow] composited to create 16 soil samples [including one QA / QC sample] and 28 individual soil samples [shallow and deep]) were collected and analysed for CoC, including Heavy Metals, OCP, TPH, PAH and / or Asbestos, and one building material samples was collected and analysed for Asbestos. Fourty-five samples were analysed.

10.1 Soil Analytical Results

Laboratory analytical results reported:

- Heavy Metals (Arsenic and / or Lead) concentrations in three shallow topsoil / fill materials samples (S43, S44, and S47), all collected from shallow topsoil / fill material samples located near identified areas of interest [sheds, garages, potential chemical storage or mixing areas or historical structures]) exceeded MfE NES Residential Human Health criteria,
- Heavy Metals (Arsenic, Lead and / or Zinc) concentrations in four soil samples (S43, S44, S47 and S64, all collected near identified areas of interest) exceeded AUP Environmental Discharge criteria,

- Asbestos was detected in one soil sample, with Fibrous Asbestos / Asbestos Fines (FA / AF) concentrations above Asbestos Human Health SGV (S60) for Residential and High-Density Residential sites, and
- Heavy Metals concentrations were above Background Levels and / or OCP, TPH and / or PAH concentrations were above laboratory Method Detection Limits (MDL) in 38 of the 88 original soil samples.

Laboratory analytical results are summarised in Table 10 below. The S&RC Sample Location Plan is provided in Appendix F. Laboratory analytical results and COC documentation are provided in Appendix H.

Table 10: Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		30 Cambridge Road				340 Riverhead Road		NES [1]		PHG [2]				
Sample Reference		CS04	S04-2D	CS05	S29	CS13 (HD)	S13-4D (HD)							
Sample Soil Type		Sandy Silt	Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt							
Guideline Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High-Density Residential	Sand	Sandy Silt			
Sample Date		28 February 2022												
Sample Depth (m)		0.1	0.5	0.1	0.1	0.1	0.8			<1m	<1m			
Heavy Metals	As	2.3	1.2	6.0	1.9	5.5	12	20	45	-	-	100	-	12
	Cd	0.19	<MDL	0.10	0.05	0.21	0.03	3	230	-	-	7.5	-	0.65
	Cr	8.5	11	5.3	4.5	12	15	460	1500	-	-	400	-	55
	Cu	9.3	2.4	5.5	4.3	38	15	10,000	10,000	-	-	325	-	45
	Pb	14	3.3	5.0	5.8	12	15	210	500	-	-	250	-	65
	Hg	0.08	0.04	0.09	0.09	0.19	0.48	310	1,000	-	-	0.75	-	0.45
	Ni	3.6	1.6	1.9	0.9	9.1	11	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	33	5.3	10.0	25	61	10	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	<MDL	<MDL	0.12	<MDL	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.6	45	-	-	-	-	-
	Dieldrin	<MDL	<MDL	<MDL	<MDL	0.05	<MDL	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	-	-	-	<MDL	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	-	-	<MDL	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	-	-	<MDL	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	-	-	<MDL	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	-	-	-	<MDL	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	-	-	-	<MDL	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	-		ND	-	-	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		1140 Coatesville Riverhead Highway & 340 Riverhead Road						NES [1]		PHG [2]				
Sample Reference		CS14	CS15	S15-4D	CS16	CS18 (HD)	S18-2D (HD)							
Sample Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Guideline Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High-Density Residential	Sand	Sandy Silt			
Sample Date		28 February 2022												
Sample Depth (m)		0.1	0.1	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	3.6	3.6	5.4	5.0	2.8	0.4	20	45	-	-	100	-	12
	Cd	0.53	0.66	0.02	0.61	0.27	0.02	3	230	-	-	7.5	-	0.65
	Cr	14	11	11	11	6.5	2.2	460	1500	-	-	400	-	55
	Cu	32	39	11	33	20	1.6	10,000	10,000	-	-	325	-	45
	Pb	13	14	13	12	9.8	3.1	210	500	-	-	250	-	65
	Hg	0.39	0.42	0.25	0.35	0.20	0.08	310	1,000	-	-	0.75	-	0.45
	Ni	5.2	5.3	4.9	6.9	3.1	0.6	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	17	25	5.4	27	16	<MDL	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	0.73	1.7	<MDL	0.64	0.37	<MDL	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.6	45	-	-	-	-	-
	Dieldrin	0.31	0.87	<MDL	0.62	0.02	<MDL	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	-	-	-	-	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	-	-	-	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	-	-	-	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	-	-	-	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	-	-	-	-	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	-	-	-	-	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-			-	-	-	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [9]	Background Level (Non-Volcanic) [5]
Site Location		1140 Coatesville Riverhead Highway & 340 Riverhead Road						NES [1]		PHG [2]				
Sample Reference		S36 (HD)	S37 (HD)	S41 (HD)	S58 (HD)	S59 (HD)	S60 (HD)							
Sample Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High- Density Residential (HD)	Sand	Sandy Silt			
Guideline Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Sample Date		28 February 2022												
Sample Depth (m)		0.1	0.1	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	30	4.2	10	31	8.0	8.5	20	45	-	-	100	-	12
	Cd	1.0	0.12	0.31	0.62	0.13	0.77	3	230	-	-	7.5	-	0.65
	Cr	24	15	20	26	11	12	460	1500	-	-	400	-	55
	Cu	91	62	79	88	25	76	10,000	10,000	-	-	325	-	45
	Pb	49	14	230	160	61	72	210	500	-	-	250	-	65
	Hg	0.66	0.06	0.29	0.22	0.21	0.37	310	1,000	-	-	0.75	-	0.45
	Ni	14	10.0	11	11	5.7	8.9	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	260	150	150	240	180	540	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	0.12	<MDL	0.3	-	-	-	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	-	-	-	2.6	45	-	-	-	-	-
	Dieldrin	0.09	<MDL	0.21	-	-	-	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	-	-	-	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	<MDL	<MDL	<MDL	-	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	<MDL	<MDL	<MDL	-	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	38	<MDL	36	-	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	0.09	<MDL	<MDL	-	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	<MDL	<MDL	<MDL	-	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	0.08	0.05	<MDL	-	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	ND	ND	ND	ND	ND	D	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	0.0024	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)					MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		1156 & 1158 Coatesville Riverhead Highway					NES [1]		PHG [2]				
Sample Reference		CS19	S38	S39	S40	S61							
Sample Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Guideline Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High- Density Residential	Sand	Sandy Silt			
Sample Date		1 March 2022											
Sample Depth (m)		0.1	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	3.6	11	3.9	11	6.1	20	45	-	-	100	-	12
	Cd	0.67	0.64	0.36	0.32	0.53	3	230	-	-	7.5	-	0.65
	Cr	14	16	16	13	13	460	1500	-	-	400	-	55
	Cu	38	42	34	83	37	10,000	10,000	-	-	325	-	45
	Pb	16	26	14	14	13	210	500	-	-	250	-	65
	Hg	0.36	0.27	0.34	0.21	0.22	310	1,000	-	-	0.75	-	0.45
	Ni	5.2	5.7	11	8.0	10.0	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	27	48	39	70	56	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	0.46	0.46	0.38	0.21	-	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	-	2.6	45	-	-	-	-	-
	Dieldrin	<MDL	<MDL	<MDL	<MDL	-	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	-	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	-	<MDL	<MDL	<MDL	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	<MDL	<MDL	<MDL	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	<MDL	<MDL	<MDL	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	<MDL	<MDL	<MDL	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	-	<MDL	<MDL	<MDL	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	-	<MDL	<MDL	0.05	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	ND	ND	ND	ND	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		1186 Coatesville Riverhead Highway						NES [1]		PHG [2]				
Sample Reference		S23-1	S23-2	S23-3	S23-4	S24-1	S24-2							
Sample Soil Type		Sand	Sand	Sand	Sand	Sand	Sand							
Guideline Soil Type		Sand	Sand	Sand	Sand	Sand	Sand	Res	High-Density Residential	Sand	Sandy Silt			
Sample Date		10 January 2022												
Sample Depth (m)		0.1	0.1	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	12	11	9.1	9.3	7.9	8.0	20	45	-	-	100	-	12
	Cd	0.78	0.78	0.78	0.85	0.78	0.99	3	230	-	-	7.5	-	0.65
	Cr	18	16	14	17	15	16	460	1500	-	-	400	-	55
	Cu	42	43	40	48	45	42	10,000	10,000	-	-	325	-	45
	Pb	12	13	14	15	18	18	210	500	-	-	250	-	65
	Hg	0.37	0.35	0.38	0.41	0.47	0.45	310	1,000	-	-	0.75	-	0.45
	Ni	4.0	4.9	4.7	5.9	5.1	6.4	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	57	85	59	82	51	69	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	0.37	0.27	0.14	0.18	0.11	0.08	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.6	45	-	-	-	-	-
	Dieldrin	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	-	-	-	-	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	-	-	-	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	-	-	-	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	-	-	-	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	-	-	-	-	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	-	-	-	-	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	-	-	-	-	-	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		1186 Coatesville Riverhead Highway			1194 Coatesville Riverhead Highway			NES [1]		PHG [2]				
Sample Reference		S24-3	S24-4	S24-2D	CS25	CS26	S25-2D							
Sample Soil Type		Sand	Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High- Density Residential	Sand	Sandy Silt			
Guideline Soil Type		Sand	Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Sample Date		10 January 2022			4 April 2022									
Sample Depth (m)		0.1	0.1	0.8	0.1	0.1	0.8			<1m	<1m			
Heavy Metals	As	8.7	9.1	6.6	8.0	9.0	7.9	20	45	-	-	100	-	12
	Cd	0.43	0.81	0.05	0.43	0.32	0.03	3	230	-	-	7.5	-	0.65
	Cr	10	19	16	12	16	21	460	1500	-	-	400	-	55
	Cu	28	34	14	77	42	15	10,000	10,000	-	-	325	-	45
	Pb	20	15	15	23	29	20	210	500	-	-	250	-	65
	Hg	0.35	0.32	0.43	0.44	0.46	0.44	310	1,000	-	-	0.75	-	0.45
	Ni	3.9	6.9	6.0	4.9	7.3	9.1	600 [6]	2,400 [6]	-	-	105	-	35
	Zn	52	60	9.6	33	26	9.3	7,000 [6]	28,000 [6]	-	-	400	-	180
OCP	**ΣDDT**	0.10	0.09	<MDL	1.2	0.31	<MDL	70	240	-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.6	45	-	-	-	-	-
	Dieldrin	<MDL	<MDL	<MDL	<MDL	0.02	<MDL	2.6	45	-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	139 [7]	707 [7]	-	-	-	-	-
TPH	C_7-C_9	-	-	-	-	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	-	-	-	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	-	-	-	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	-	-	-	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	-	-	-	-	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	-	-	-	-	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	-	-	-	-	-	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		1194 Coatesville Riverhead Highway			1200 Coatesville Riverhead Highway			NES [1]		PHG [2]				
Sample Reference		S46	S47	S64	S47	S65	S66							
Sample Soil Type		Sand	Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High-Density Residential	Sand	Sandy Silt			
Guideline Soil Type		Sand	Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Sample Date		4 April 2022			1 March 2022									
Sample Depth (m)		0.1	0.1	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	18	7.9	9.6	130	18	10	20	45	-		100	-	12
	Cd	0.49	0.32	0.32	0.28	0.13	0.19	3	230	-		7.5	-	0.65
	Cr	17	17	19	72	31	15	460	1500	-		400	-	55
	Cu	93	32	73	130	43	56	10,000	10,000	-		325	-	45
	Pb	19	29	32	1,200	17	36	210	500	-		250	-	65
	Hg	0.37	0.29	0.41	0.07	0.20	0.29	310	1,000	-		0.75	-	0.45
	Ni	6.8	6.3	11	42	72	5.1	600 [6]	2,400 [6]	-		105	-	35
	Zn	110	59	1,300	190	170	84	7,000 [6]	28,000 [6]	-		400	-	180
OCP	**ΣDDT**	0.24	0.12	-	0.02	-	-	70	240	-		12	-	-
	Aldrin	<MDL	<MDL	-	<MDL	-	-	2.6	45	-		-	-	-
	Dieldrin	<MDL	<MDL	-	<MDL	-	-	2.6	45	-		-	-	-
	Lindane	<MDL	<MDL	-	<MDL	-	-	139 [7]	707 [7]	-		-	-	-
TPH	C_7-C_9	<MDL	<MDL	-	<MDL	-	-	-	-	120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	<MDL	<MDL	-	<MDL	-	-	-	-	(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	<MDL	<MDL	-	82	-	-	-	-	(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	<MDL	0.14	-	0.15	-	-	10	24	- [8]	- [8]	20	-	-
	Naphthalene	<MDL	<MDL	-	<MDL	-	-	-	-	58 [v]	63 [v]	-	-	-
	Pyrene	<MDL	0.08	-	0.51	-	-	-	-	(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	-	-	ND	ND	ND	-	-	-		-	-	-
	ACM	-	-	-	-	-	-	-	-	-		-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	-	-		-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)						MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		51 Lathrope Road						NES [1]		PHG [2]				
Sample Reference		CS21	S21-3D	CS22	S43	S44	S45							
Sample Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt							
Guideline Soil Type		Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Res	High- Density Residential	Sand	Sandy Silt			
Sample Date		17 January 2022												
Sample Depth (m)		0.1	0.8	0.1	0.1	0.1	0.1			<1m	<1m			
Heavy Metals	As	7.4	6.4	7.4	21	45	6.2	20		-	-	100	-	12
	Cd	0.31	0.04	0.61	0.37	0.19	0.76	3		-	-	7.5	-	0.65
	Cr	11	11	13	23	28	12	460		-	-	400	-	55
	Cu	26	13	49	34	82	50	10,000		-	-	325	-	45
	Pb	16	14	16	36	15	17	210		-	-	250	-	65
	Hg	0.44	0.37	0.44	0.37	0.08	0.38	310		-	-	0.75	-	0.45
	Ni	4.0	5.9	6.3	6.1	29	12	600 [6]		-	-	105	-	35
	Zn	25	9.3	52	440	2,000	57	7,000 [6]		-	-	400	-	180
OCP	**ΣDDT**	0.04	<MDL	0.25	0.10	<MDL	-	70		-	-	12	-	-
	Aldrin	<MDL	<MDL	<MDL	<MDL	<MDL	-	2.6		-	-	-	-	-
	Dieldrin	<MDL	<MDL	<MDL	0.20	<MDL	-	2.6		-	-	-	-	-
	Lindane	<MDL	<MDL	<MDL	<MDL	<MDL	-	139 [7]		-	-	-	-	-
TPH	C_7-C_9	-	-	-	<MDL	<MDL	<MDL	-		120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}	-	-	-	<MDL	<MDL	<MDL	-		(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}	-	-	-	<MDL	<MDL	<MDL	-		(20,000)	(20,000)	-	-	-
PAH	BaP Eq.	-	-	-	<MDL	<MDL	<MDL	10		- [8]	- [8]	20	-	-
	Naphthalene	-	-	-	<MDL	<MDL	<MDL	-		58 [v]	63 [v]	-	-	-
	Pyrene	-	-	-	<MDL	<MDL	<MDL	-		(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND	-	-	-	ND	ND	ND	-		-	-	-	-	-
	ACM	-	-	-	-	-	-	-		-	-	-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-		-	-	-	0.001	-

Table 10 (Continued): Soil Analytical Results (S&RC, 2022)

		Test Analysis Levels (mg/kg)		MfE				AUP [3]	Asbestos SGV [4]	Background Level (Non-Volcanic) [5]
Site Location		22 Duke Street		NES [1]		PHG [2]				
Sample Reference		CS01	S01-2D							
Sample Soil Type		Sandy Silt	Silt							
Guideline Soil Type		Sandy Silt	Sandy Silt	Res	High-Density Residential	Sand	Sandy Silt			
Sample Date		28 February 2022								
Sample Depth (m)		0.1	0.8			<1m	<1m			
Heavy Metals	As	4.0	1.5	20		-	-	100	-	12
	Cd	0.10	<MDL	3		-	-	7.5	-	0.65
	Cr	19	9.0	460		-	-	400	-	55
	Cu	24	3.4	10,000		-	-	325	-	45
	Pb	20	5.4	210		-	-	250	-	65
	Hg	0.11	0.16	310		-	-	0.75	-	0.45
	Ni	21	3.6	600 [6]		-	-	105	-	35
	Zn	75	<MDL	7,000 [6]		-	-	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	70		-	-	12	-	-
	Aldrin	<MDL	<MDL	2.6		-	-	-	-	-
	Dieldrin	<MDL	<MDL	2.6		-	-	-	-	-
	Lindane	<MDL	<MDL	139 [7]		-	-	-	-	-
TPH	C_7-C_9		-	-		120 [m]	(500) [m]	-	-	-
	C_{10}-C_{14}		-	-		(470) [x]	(510) [x]	-	-	-
	C_{15}-C_{36}		-	-		(20,000)	(20,000)	-	-	-
PAH	BaP Eq.		-	10		- [8]	- [8]	20	-	-
	Naphthalene		-	-		58 [v]	63 [v]	-	-	-
	Pyrene		-	-		(1,600) [p]	(1,600) [p]	-	-	-
Asbestos	D/ND			-	-	-	-	-	-	-
	ACM	-	-	-	-	-	-	-	0.01 / 0.04	-
	FA/AF	-	-	-	-	-	-	-	0.001	-

Notes: Concentration: Values below accepted Background Levels (Heavy Metals) and/or laboratory MDL (OCP, TPH, PAH)
Concentration: Values above accepted Background Levels and/or laboratory MDL but in compliance with relevant criteria

Concentration: Values above relevant acceptance criteria
ND = Asbestos Not Detected
D = Asbestos Detected
Res = NES Residential use criteria
HD = Results compared against NES High-Density Residential use criteria

[1] NES – MfE NES Human Health Criteria for Residential Use (MfE, 2012)
[2] PHG – Soil MfE Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (2011) Tier 1 Soil Acceptance Criteria for Residential Use (All Pathways), 'Sand' and 'Sandy Silt' soil types, <1m. Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons. At 20,000 mg/kg, residual separate phase is expected to have formed in soil matrix. The following notes indicate the limiting pathway for each criterion: v = volatilisation, s = soil ingestion, d = dermal, p = produce, m = maintenance/excavation, x = PAH surrogate
[3] AUP – AUP Permitted Activity Soil Acceptance Criteria for Environmental Discharge: Auckland Unitary Plan Operative in part (AUP, 2016)
[4] Asbestos SGV – Asbestos Soil Guidelines Values (%w/w) for Asbestos Containing Material (ACM) and Fibrous Asbestos / Asbestos Fines (FA/AF) for Residential sites, New Zealand Guidelines for Assessing and Managing Asbestos in Soil (2017).
[5] Auckland Region Background Level – Schedule 11: Auckland Regional Plan (Non-Volcanic Soils)
[6] Australian Health Investigation Levels for Residential use (NEPC, 1999), applied in accordance with MfE Contaminated Land Guidelines No. 2
[7] MfE Soil Guidelines for Former Sheep-Dip Sites for Residential Use (MfE, 2006)
[8] Where NES and / or Regional Council acceptance criteria values are available, NES and/or Regional Council values are applied over PHG criteria
[9] Asbestos SGV – Asbestos Soil Guidelines Values (%w/w) for Asbestos Containing Material (ACM) and Fibrous Asbestos / Asbestos Fines (FA/AF) for Residential and High-Density Residential sites, New Zealand Guidelines for Assessing and Managing Asbestos in Soil (2017).

10.2 Building Material Analytical Results

Building material laboratory analytical results reported:

- Asbestos was detected in the collected building material sample.

Building material laboratory analytical results are summarised in Table 11 below. Sampling locations are provided in Appendix F. Laboratory analytical results and COC documentation are provided in Appendix H.

Table 11: Building Material Analytical Results

Contaminant of Concern		Test Analysis Levels (mg/kg)
		1140 Coatesville Riverhead Highway
		ASB-1
		0.0 (surface)
Asbestos	D/ND	D

Notes: ND = Asbestos Not Detected
D = Asbestos Detected

10.3 Quality Assurance / Quality Control

One duplicate soil sample set (CS101, which is a duplicate of CS14) was collected for QA / QC purposes. The duplicate soil samples were collected using the same soil sampling procedures and composited and analysed at the laboratory using the same sample preparation and analysis procedures as the original samples.

Relative Percentage Difference (RPD) calculations for analytes reported above the laboratory MDL ranged from 0.0 to 40.4%. RPD values for the duplicate pair meet S&RC QA/QC acceptance criteria of less than 50%.

QA / QC results are presented in Table 12 below. Laboratory analytical results are provided in Appendix F.

Table 12: Quality Assurance / Quality Control Results

Contaminant of Concern		Results (mg/kg)		RPD (%)
		CS14	CS101	
Heavy Metals	As	3.6	3.6	0.0
	Cd	0.53	0.54	1.9
	Cr	14	11	24.0
	Cu	32	33	3.1
	Pb	13	13	0.0
	Hg	0.39	0.44	12.0
	Ni	5.2	5.3	1.9
	Zn	17	17	0.0
OCP	**ΣDDT**	0.73	1.1	40.4
	Aldrin	<MDL	<MDL	-
	Dieldrin	0.31	0.33	6.3
	Lindane	<MDL	<MDL	-

MDL = laboratory Method Detection Limit
OCP = Organochlorine Pesticides
mg/kg = milligrams per kilogram
RPD = Relative Percentage Difference

11.0 Analytical Results – Focus Environmental (DSI, 2018)

Focus Environmental collected soil samples from the following sites:

- 306 Riverhead Road (Lot 1 DP 164978),
- 328 Riverhead Road (Pt Lot 2 DP 37435), and
- Lathrope Road (Lot 2 DP 164978 and Lot 2 DP 64605).

A total of 247 soil samples (220 soil samples [shallow] composited to create 55 soil samples and 27 individual soil samples [including three QA / QC samples]) were collected and analysed for CoC, including Heavy Metals, OCP, PAH and / or Asbestos, and one building material samples were collected and analysed for Asbestos. Eighty samples were analysed.

11.1 Soil Analytical Results

Laboratory analytical results reported:

In September 2018, Focus Environmental collected a total of 247 soil samples (220 soil samples [shallow] composited to create 55 soil samples and 27 individual soil samples [including three QA / QC samples]) that were analysed for CoC, including Heavy Metals, OCP, PAH and / or Asbestos, and one building material sample was collected and analysed for Asbestos. Eighty samples were analysed. Laboratory analytical results reported:

- Elevated concentrations of Heavy Metals, OCP, PAH and Asbestos fibres were detected in the site soils in localised area,
- Concentrations of Heavy Metals (Arsenic and Lead) were detected in the site soils at specific locations at levels elevated above Human Health criteria for residential land use (10% produce consumption),
- Heavy Metals concentrations (Copper and Lead) were detected in the site soils at specific locations at levels elevated above the Environmental discharge criteria of the Auckland Unitary Plan, and
- Heavy Metals concentrations were above Background Levels and / or OCP and PAH concentrations were above laboratory MDL in most soil samples collected.

Laboratory analytical results are summarised in Table 13 below. Focus Environmental Sample Location Plan is provided in Appendix G. Laboratory analytical results and COC documentation are provided in Appendix I. The Focus Environmental Services DSI report (Ref. FES 1139.001, *Detailed Site Investigation, Pooks Blocks, Riverhead, Auckland,* October 2018) is available on request.

Table 13: Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)					MfE			
Sample Reference		COMP01	Individual composite sample analysis				NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
			COMP01-A	COMP01-B	COMP01-C	COMP01-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	6	-	-	-	-	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	69	-	-	-	-	10,000	325	-	45
	Pb	163	78	184	310	103	210	250	-	65
	Ni	-	-	-	-	-	600 [5]	105	-	35
	Zn	-	-	-	-	-	7,000 [5]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	0.079	-	-	-	-	2.6	-	-	-

		Test Analysis Levels (mg/kg)					MfE			
Sample Reference		COMP02	Individual composite sample analysis				NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
			COMP02-A	COMP02-B	COMP02-C	COMP02-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	9	-	-	-	-	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	137	39	260	113	93	10,000	325	-	45
	Pb	123	63	220	74	129	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	<MDL	-	-	-	-	2.6	-	-	-

Table 13: Soil Analytical Results (Focus Environmental, 2018)

Sample Reference		Test Analysis Levels (mg/kg)					MfE	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
		COMP03	Individual composite sample analysis							
			COMP03-A	COMP04-B	COMP03-A	COMP04-D	COMP03			
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	5	-	-	-	-	-	20	100	-	12
	-	-	-	-	-	-	3	7.5	-	0.65
	-	-	-	-	-	-	460	400	-	55
	84	91	71	80	91	84	10,000	325	-	45
	37	-	-	-	-	-	210	250	-	65
	-	-	-	-	-	-	600 [6]	105	-	35
	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	0.13	-	-	-	-	-	70	12	-	-
	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	-	2.6	-	-	-

Sample Reference		Test Analysis Levels (mg/kg)					MfE	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
		COMP04	Individual composite sample analysis							
			COMP04-A	COMP04-B	COMP04-C	COMP04-D	NES [1]			
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	-	-	-	-	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	88	83	106	76	84	10,000	325	-	45
	Pb	18.5	-	-	-	-	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	0.101	-	-	-	-	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

Sample Reference		Test Analysis Levels (mg/kg)					MfE			
		COMP05	Individual composite sample analysis				NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
			COMP05-A	COMP05-B	COMP05-C	COMP05-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	22	34	49	61	6	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	74	-	-	-	-	10,000	325	-	45
	Pb	94	105	75	44	63	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.18	-	-	-	-	70	12	-	-
	Dieldrin	0.084	-	-	-	-	2.6	-	-	-

Sample Reference		Test Analysis Levels (mg/kg)					MfE			
		COMP06	Individual composite sample analysis				NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
			COMP06-A	COMP06-B	COMP06-C	COMP06-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	14	24	26	5	17	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	41	-	-	-	-	10,000	325	-	45
	Pb	17.8	-	-	-	-	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	<MDL	-	-	-	-	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

Sample Reference		Test Analysis Levels (mg/kg)					MfE		Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
		COMP07	Individual composite sample analysis				NES [1]	AUP [2]		
			COMP07-A	COMP07-B	COMP07-C	COMP07-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	13	6	22	7	16	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	59	-	-	-	-	10,000	325	-	45
	Pb	16.4	-	-	-	-	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	0.040	-	-	-	-	2.6	-	-	-

Sample Reference		Test Analysis Levels (mg/kg)					MfE		Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
		COMP10	Individual composite sample analysis				NES [1]	AUP [2]		
			COMP10-A	COMP10-B	COMP10-C	COMP10-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	20	5	66	12	4	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	55	-	-	-	-	10,000	325	-	45
	Pb	20	-	-	-	-	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	70	12	-	-
	Dieldrin	0.021	-	-	-	-	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

Sample Reference		Test Analysis Levels (mg/kg)					MfE			
		COMP13	Individual composite sample analysis				NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
			COMP13-A	COMP13-B	COMP13-C	COMP13-D				
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	13	4	6	7	46	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	62	-	-	-	-	10,000	325	-	45
	Pb	18.6	-	-	-	-	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.20	-	-	-	-	70	12	-	-
	Dieldrin	0.25	-	-	-	-	2.6	-	-	-

Sample Reference		Test Analysis Levels (mg/kg)				MfE			
		COMP08	COMP09	COMP11	COMP12	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018							
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	5	5	4	20	100	-	12
	Cd	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	460	400	-	55
	Cu	59	53	56	55	10,000	325	-	45
	Pb	15.7	19.1	17.7	18.4	210	250	-	65
	Ni	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	0.05	0.04	0.042	0.06	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)					MfE			
Sample Reference		COMP14	COMP15	COMP16	COMP17	COMP18	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018								
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	5	6	4	4	3	20	100	-	12
	Cd	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	460	400	-	55
	Cu	65	53	35	35	32	10,000	325	-	45
	Pb	19.6	21	18.9	20	17.8	210	250	-	65
	Ni	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.15	<MDL	<MDL	<MDL	0.11	70	12	-	-
	Dieldrin	0.31	0.067	0.029	0.054	0.063	2.6	-	-	-

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		COMP19	COMP20	COMP21	COMP22	COMP23	COMP24	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	9	3	3	3	3	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	47	53	29	33	27	27	10,000	325	-	45
	Pb	16.2	16.1	16.0	15.5	16.5	15.5	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.12	0.15	<MDL	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	0.122	0.113	0.038	0.029	0.053	0.073	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)						MfE	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Reference		COMP25	COMP26	COMP27	COMP28	COMP29	COMP30	NES [1]			
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	3	4	3	3	4	4	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	26	44	46	50	38	42	10,000	325	-	45
	Pb	16.5	16.4	16.7	20	16.2	19.0	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	<MDL	<MDL	<MDL	0.23	70	12	-	-
	Dieldrin	0.087	0.086	0.124	0.091	0.045	0.22	2.6	-	-	-

		Test Analysis Levels (mg/kg)						MfE	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Reference		COMP31	COMP32	COMP33	COMP34	COMP35	COMP36	NES [1]			
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	3	4	4	4	3	3	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	42	41	40	41	43	44	10,000	325	-	45
	Pb	17.2	18.7	18.9	21	17.9	17.6	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.21	0.13	0.23	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	0.20	0.153	0.116	0.067	0.104	0.092	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		COMP37	COMP38	COMP39	COMP40	COMP41	COMP42	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	4	4	4	5	4	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	40	43	40	33	43	36	10,000	325	-	45
	Pb	16.7	15.6	16.1	48	29	21	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	0.10	0.07	0.103	<MDL	0.035	0.048	2.6	-	-	-

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		COMP43	COMP44	COMP45	COMP46	COMP47	COMP48	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	5	4	4	5	4	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	30	37	41	37	35	36	10,000	325	-	45
	Pb	19.5	15.3	15.4	16.3	16.0	16.2	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	0.17	0.11	0.11	0.10	*0.18*	70	12	-	-
	Dieldrin	0.027	0.141	0.095	0.076	0.081	0.170	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		COMP49	COMP50	COMP51	COMP52	COMP53	COMP54	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	4	4	6	7	7	7	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	37	37	33	36	35	35	10,000	325	-	45
	Pb	16.7	18.5	18.0	17.9	17.4	17.1	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.18	<MDL	<MDL	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	0.179	0.109	0.076	0.137	0.080	0.047	2.6	-	-	-

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		COMP55	Pb01	Pb02	Pb03	Pb04	Pb05	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	7	-	-	-	-	-	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	39	-	-	-	-	-	10,000	325	-	45
	Pb	19.7	360	270	660	350	380	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	-	-	-	-	-	70	12	-	-
	Dieldrin	0.058	-	-	-	-	-	2.6	-	-	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		Pb06	Pb07	Pb08	Pb09	Pb10	Pb11	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	-	-	-	-	-	-	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	-	-	-	-	-	-	10,000	325	-	45
	Pb	128	630	137	28	31	80	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	-	-	-	-	-	-	70	12	-	-
	Dieldrin	-	-	-	-	-	-	2.6	-	-	-

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		HB01	HB02	HB03	HB04 A	HB04 B	HB05 A	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	-	4	4	3	3	5	20	100	-	12
	Cd	-	-	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	-	-	460	400	-	55
	Cu	-	37	38	47	50	58	10,000	325	-	45
	Pb	22	17.5	22	19.8	18.8	22	210	250	-	65
	Ni	-	-	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	-	0.33	<MDL	<MDL	<MDL	<MDL	70	12	-	-
	Dieldrin	-	0.122	0.028	0.106	0.085	<MDL	2.6	-	-	-
Asbestos	D/ND	ND	ND	ND	ND	-	ND	-	-	-	-
	ACM	-	-	-	-	-	-	-	-	0.01	-
	FA/AF	-	-	-	-	-	-	-	-	0.001	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)						MfE			
Sample Reference		HB05 B	HB06	HB07	HB08	HB09	BP01	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018									
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15				
Heavy Metals	As	12	-	-	11	3	4	20	100	-	12
	Cd	-	-	-	-	-	0.26	3	7.5	-	0.65
	Cr	-	-	-	-	-	6	460	400	-	55
	Cu	34	-	-	310	-	10	10,000	325	-	45
	Pb	23	58	85	178	820	14.7	210	250	-	65
	Ni	-	-	-	-	-	3	600 [6]	105	-	35
	Zn	-	-	-	-	-	15	7,000 [6]	400	-	180
OCP	**ΣDDT**	0.10	-	-	<MDL	-	-	70	12	-	-
	Dieldrin	0.044	-	-	0.020	-	-	2.6	-	-	-
PAH	BaP Eq.	-	-	-	-	-	<MDL	10	20	-	-
Asbestos	D/ND	-	ND	ND	ND	ND	-	-	-	-	-
	ACM	-	-	-	-	-	-	-	-	0.01	-
	FA/AF	-	-	-	-	-	-	-	-	0.001	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)				MfE			
Sample Reference		DS01	HA01	HA02	ASB01	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018							
Sample Depth (m)		0 - 0.15	0.3	0.4	0 - 0.15				
Heavy Metals	As	4	10	4	-	20	100	-	12
	Cd	-	0.27	0.23	-	3	7.5	-	0.65
	Cr	-	12	13	-	460	400	-	55
	Cu	470	62	38	-	10,000	325	-	45
	Pb	69	84	37	-	210	250	-	65
	Ni	-	3	5	-	600 [6]	105	-	35
	Zn	-	138	52	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	<MDL	<MDL	-	70	12	-	-
	Dieldrin	0.03	<MDL	<MDL	-	2.6	-	-	-
PAH	BaP Eq.	-	0.13	<MDL	-	10	20	-	-
Asbestos	D/ND	-	-	-	D	-	-	-	-
	ACM	-	-	-	<0.001	-	-	0.01	-
	FA/AF	-	-	-	<0.001	-	-	0.001	-

Table 13 (Continued): Soil Analytical Results (Focus Environmental, 2018)

		Test Analysis Levels (mg/kg)				MfE			
Sample Reference		QC01	QC02	QC03	PACM01	NES [1]	AUP [2]	Asbestos SGV [3]	Background Level (Non-Volcanic) [4]
Sample Date		September 2018							
Sample Depth (m)		0 - 0.15	0 - 0.15	0 - 0.15	-				
Heavy Metals	As	3	3	5	-	20	100	-	12
	Cd	-	-	-	-	3	7.5	-	0.65
	Cr	-	-	-	-	460	400	-	55
	Cu	33	38	35	-	10,000	325	-	45
	Pb	15.9	21	15.1	-	210	250	-	65
	Ni	-	-	-	-	600 [6]	105	-	35
	Zn	-	-	-	-	7,000 [6]	400	-	180
OCP	**ΣDDT**	<MDL	0.19	<MDL	-	70	12	-	-
	Dieldrin	0.066	0.126	0.026	-	2.6	-	-	-
PAH	BaP Eq.	-	-	-	-	10	20	-	-
Asbestos	D/ND	-	-	-	D	-	-	-	-
	ACM	-	-	-	not provided	-	-	0.01	-
	FA/AF	-	-	-	not provided	-	-	0.001	-

12.0 Discussion

12.1 Conceptual Site Model

A Conceptual Site Model (CSM) was developed for the site to provide a preliminary assessment of potential effects on Human Health and the Environment. The CSM is presented in Table 14 below:

Table 14: Conceptual Site Model

Exposure Pathway	Potential Receptors	Risk Assessment	
Human Health Soil Ingestion, Inhalation (Dust), Dermal Contact, Produce	During Construction Subsurface Construction / Maintenance Workers	• CoC concentrations in three soil samples (S&RC) and 17 soil samples (Focus Environmental) exceeded MfE NES Human Health criteria, • Asbestos was detecting in two soil samples (one sample from the S&RC DSI [2022] investigation and one soil sample from the Focus Environmental DSI [2018] investigation), with concentrations above Human Health SGV, and • Prior to earthworks, a site-specific Site Management Plan / Remediation Action Plan (SMP / RAP) should be prepared, outlining remediation and control measures to be implemented prior to / during redevelopment.	Risk Must be Managed
	After Construction Subsurface Construction / Maintenance Workers, On-site Users		
Environmental Discharge Contaminant Migration	During Construction Groundwater, Flora / Fauna	• CoC concentrations exceeded applicable AUP Environmental Discharge criteria, • Asbestos was detected in two soil samples (one sample from the S&RC DSI [2022] investigation and one soil sample from the Focus Environmental DSI [2018] investigation), • Heavy Metals concentrations were above Background Levels and OCP, TPH and / or PAH concentrations were above laboratory MDL in most of the soil samples, • The nearest surface water to the site is an unnamed stream located immediately north of the site at the closest point, • Groundwater was encountered is anticipated to be approximately 0.8m bgl and 3.3m bgl beneath the site, • Prior to earthworks, site-specific SMP / RAP should be prepared for the site, outlining remediation and control measures to be implemented prior to / during redevelopment, and • Any fill material disposed of off-site will be disposed of at a facility licenced to accept such materials.	Risk Must be Managed
	During Construction Groundwater, Flora / Fauna		

12.2 Regulatory Implications

Based on findings from this investigation, Table 15 presents potential Resource Consent requirements for the proposed activity under the provisions of the AUP and NES. This investigation presents factual information for the site. Matters of control and discretion, however, rest with the consenting authority (Auckland Council) based on their assessment of this report. It would be appropriate to seek clarification of Auckland Council or an Environmental Planning Specialist for further information on resource consenting requirements.

Table 15: Current Regulations and Potential Resource Consent Requirements

	Potential Applicable Planning Rules
National Environmental Standard (NES)	RESTRICTED DISCRETIONARY ACTIVITY, subject to requirements under Rule 10 • A DSI (this investigation) has been prepared for the site, • Concentrations of target contaminants exceeded NES Human Health criteria, • Asbestos concentrations in soil exceeded SGV criteria, • Restricted Discretionary Activity status assumes a SMP / RAP will be prepared for the site and the site will be managed / remediated, and • Conditions of Rule 10 must be complied with.
Auckland Unitary Plan Operative in part (AUP)	CONTROLLED ACTIVITY (Chapter E30.6.2) • A DSI (this investigation) has been prepared for the site, • Concentrations of target contaminants exceeded AUP Environmental Discharge criteria, • Asbestos was detected in soil samples, • Controlled Activity status assumes a SMP / RAP will be prepared for the site and the site will be managed / remediated, and • Conditions of Chapter E30.6.2 must be complied with.
Asbestos Regulations 2016, WorkSafe Guidelines	ASBESTOS-RELATED WORK • Asbestos was detected, with FA / AF concentrations ≥0.001% and / or ACM concentrations ≥0.01%, and • Asbestos Regulations 2016 and WorkSafe Guidelines must be adhered to.

13.0 Conclusion

This PSI / DSI was carried out for the site in accordance with the scope of work and current applicable regulations. This report has been prepared in accordance with MfE's Guidelines for Contaminated Site Investigations and Auckland Council requirements. The investigation and reporting have been prepared, reviewed and authorised by SQEP, as required under the NES.

Historical information available for the site and observations from the site walkovers indicate that the following HAIL activities have, or potentially have, occurred at the site:

- Persistent pesticide bulk storage or use associated with horticultural activities (HAIL Cat. A.10),

- Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances (HAIL Cat. F. 8)
- Potential Asbestos or ACM in building materials in historical buildings (HAIL Cat. E.1),
- Landfill sites (HAIL Cat. G.3),
- Waste Disposal to land (excluding where biosolids have been used as soil conditioners) (HAIL Cat. G.5),
- Potential Lead-based paint on site structures / historical buildings (HAIL Cat. I), and
- Undocumented fill (HAIL Cat. I).

Between January – April 2022, S&RC collected a total of 92 soil samples (64 soil samples [shallow] composited to create 16 soil samples [including one QA / QC sample] and 28 individual soil samples [shallow and deep]) that were analysed for CoC, including Heavy Metals, OCP, TPH, PAH and / or Asbestos, and one building material samples was collected and analysed for Asbestos. Fourty-five samples were analysed. Laboratory analytical results reported:

- Heavy Metals (Arsenic and / or Lead) concentrations in three shallow topsoil / fill materials samples (S43, S44 and S47, all collected from shallow topsoil / fill material samples located near identified areas of interest [sheds, garages, potential chemical storage or mixing areas or historical structures]) exceeded MfE NES Residential Human Health criteria,
- Heavy Metals (Arsenic, Lead and / or Zinc) concentrations in four soil samples (S43, S44, S47 and S64, all collected near identified areas of interest) exceeded AUP Environmental Discharge criteria,
- Asbestos was detected in one soil sample, with Fibrous Asbestos / Asbestos Fines (FA / AF) concentrations above Asbestos Human Health SGV (S60), and
- Heavy Metals concentrations were above Background Levels and / or OCP, TPH and / or PAH concentrations were above laboratory Method Detection Limits (MDL) in 38 of the 88 original soil samples.

In September 2018, Focus Environmental collected a total of 247 soil samples (220 soil samples [shallow] composited to create 55 soil samples and 27 individual soil samples [including three QA / QC samples]) that were analysed for CoC, including Heavy Metals, OCP, PAH and / or Asbestos, and one building material sample was collected and analysed for Asbestos. Eighty samples were analysed. Laboratory analytical results reported:

- Elevated concentrations of heavy metals, organochlorine pesticides, polycyclic aromatic hydrocarbons and asbestos fibres were detected in the site soils in localised area,

- Concentrations of Heavy Metals (Arsenic and Lead) were detected in the site soils at specific locations at levels elevated above Human Health criteria for residential land use (10% produce consumption),
- Heavy Metals concentrations (Copper and Lead) were detected in the site soils at a specific locations at levels elevated above the Environmental discharge criteria of the Auckland Unitary Plan, and
- Heavy Metals concentrations were above Background Levels and / or OCP and PAH concentrations were above laboratory MDL in most soil samples collected.

14.0 Recommendations

Based on these findings:

- Prior to earthworks or site redevelopment, a site-specific SMP / RAP must be completed outlining remediation and control measures to be in place in order to ensure that site conditions are protective of Human Health and the Environment,
- Soil / fill material with Heavy Metals concentrations above applicable Human Health and / or Environmental Discharge criteria should be remediated (excavated and disposed of off-site or otherwise isolated),
- Any fill material / soil with Heavy Metals concentrations above Background Levels and / or Organic CoC concentrations above MDL is not considered 'Cleanfill' for disposal purposes and must be disposed of at a facility licensed to accept such materials. Findings from this report should be presented to the receiving facility for reference,
- Prior to any earthworks or redevelopment in the vicinity of the historical landfill area at 22 Duke Street property, further assessment is required to determine the area, volume and associated contaminants of the historical landfill during development planning of the property prior to Resource Consent and that contaminated fill material must be remediated prior to any future redevelopment of the site,
- Further delineation soil sampling is recommended on some properties prior to future redevelopment, and
- Any visual / olfactory evidence of contamination discovered during site works should be segregated and analysed prior to disposal.

Subsequent to the completion of these recommendations, the site is considered suitable for future urban development.

End of Report Text – Appendices Follow

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Appendix A

Site Plan

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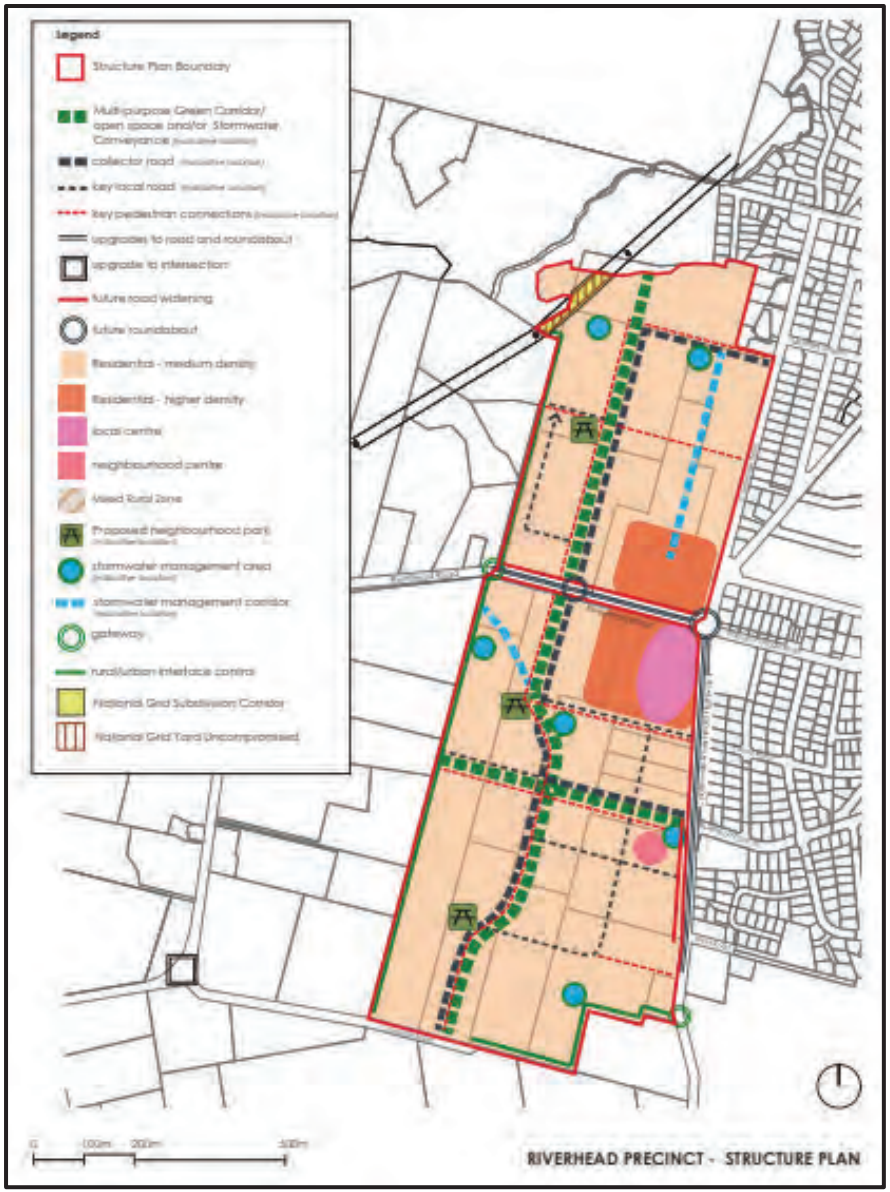
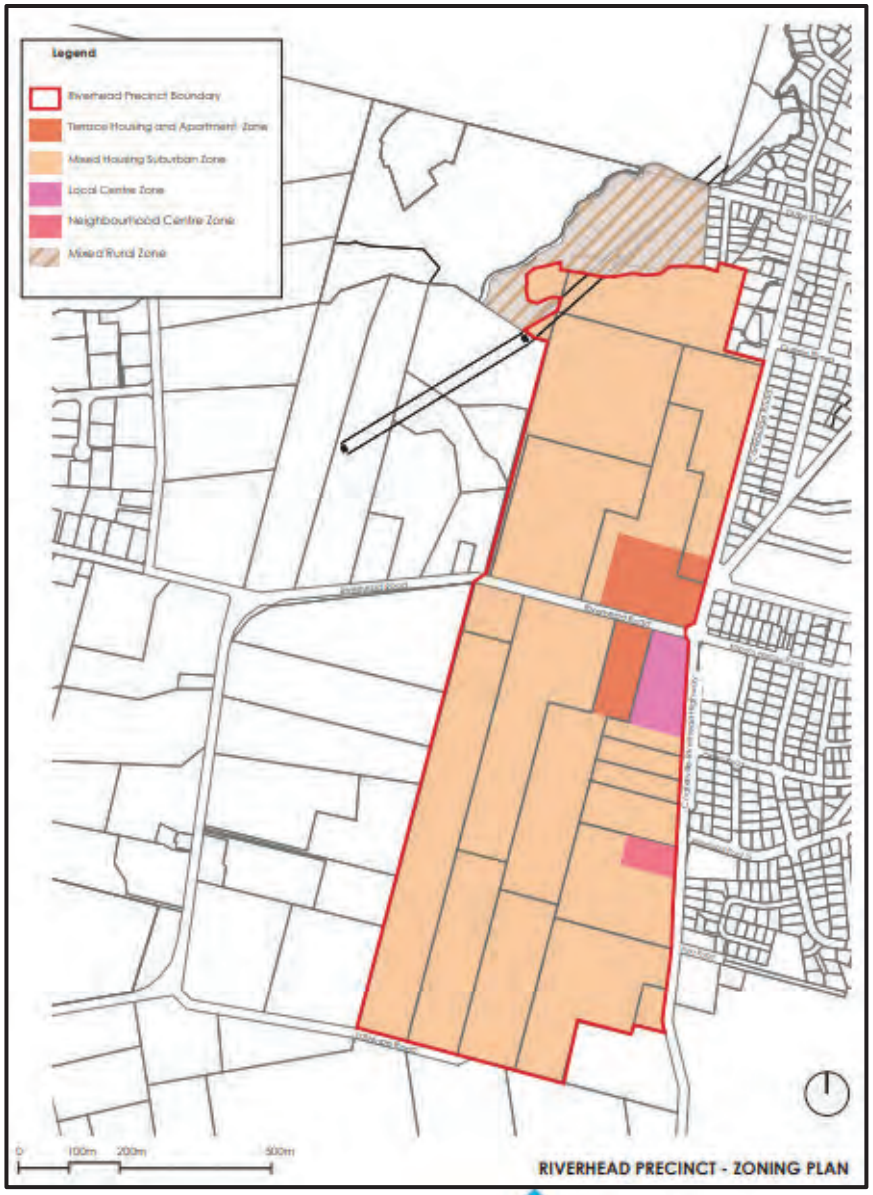
Job No. 21710 / 1 – Riverhead Precinct Development





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Appendix B

Photographic Documentation

Photo 1: View from the north-west corner of 1186 Coatesville – Riverhead Highway looking towards the south-east corner of the site where the dwelling and associated structures are located. The site appears to be completely grassland with wooden poles likely a remnant of past horticultural activities.

Photo 2: View from the south-west corner of 1186 Coatesville – Riverhead Highway looking towards the north-east to where Coatesville – Riverhead Highway is located behind the shorter of the shelterbelt trees.

Photo 3: View from the dwelling property northern boundary of 51 Lathrope Road looking south towards the dwelling on the site.

Photo 4: View from the dwelling property northern boundary at 51 Lathrope Road looking south-west towards a former structure, it is unknown the use for the structure.

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Photo 5: View from the associated structure in the south-west corner of 51 Lathrope Road, the structure contains what appears to have been a site office / admin facility and implement sheds for equipment and other sheds for use unknown.

Photo 6: View from the south-west corner of the 51 Lathrope Road site towards a shed likely used as an implement shed for storing machinery and equipment.

Photo 7: View from the associated structure in the south-west corner of the site looking towards the site access / exit (middle left of photograph), shipping containers (in good condition) are visible next to sheds. Ground cover in the area is compacted gravel / fill material.

Photo 8: View from 30 Cambridge Road looking north-west, site contains random structures across the site and vehicles parked up. High voltage powerlines are on the sites northern boundary, beyond that is the 22 Duke Street site and the Riverhead Forest.

Photo 9: View from 340 Riverhead Road looking towards the south-west at the point where the site narrows and changes between the location with structures and driveways to the southern part of the site which is completely utilised for horticultural use.

Photo 10: View from the structures on the northern boundary at 22 Duke Street looking towards the west with Riverhead Forest in the background. The structures on this site are old and in a state of disrepair.

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Appendix C

Historical Aerial Photograpy

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Retrolens

1940

Historical Aerial Photography

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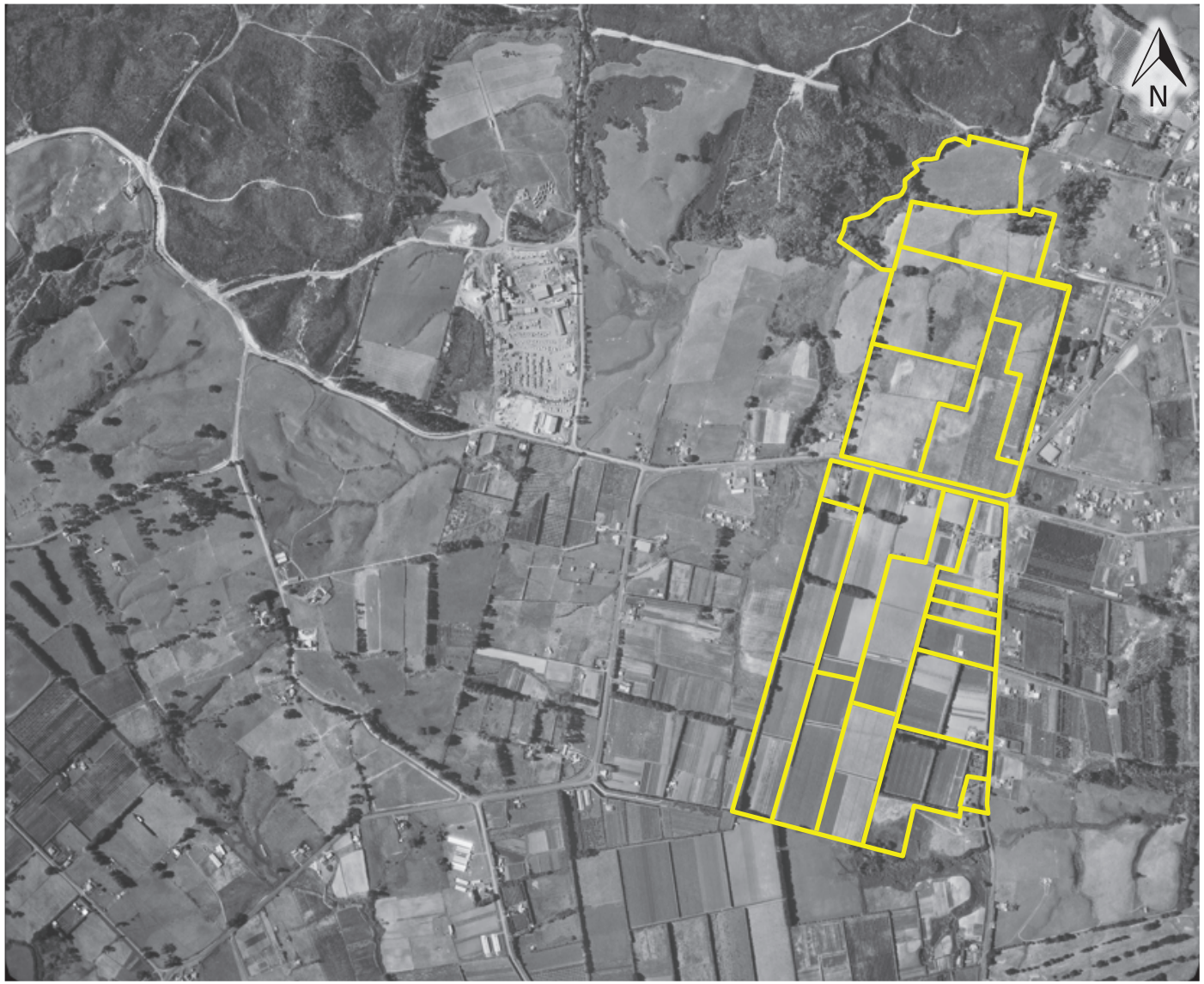
Retrolens

1963

Historical Aerial Photography

Auckland Council GeoMaps



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Retrolens

1973

Historical Aerial Photography

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Retrolens

1988

Historical Aerial Photography

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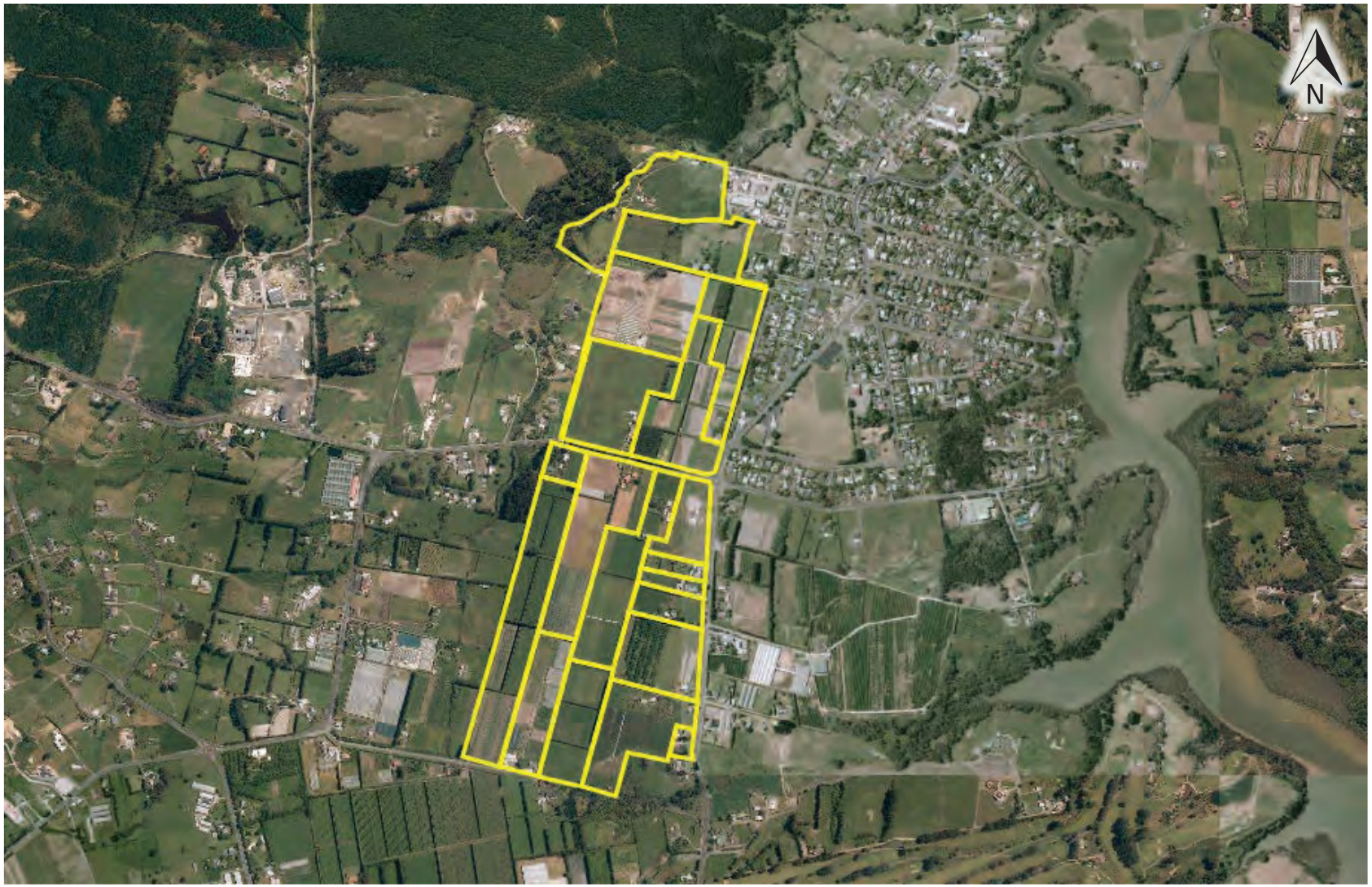
Auckland Council

1996

Historical Aerial Photography

Auckland Council GeoMaps



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Auckland Council

2010

Historical Aerial Photography

Auckland Council GeoMaps

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Auckland Council

2017

Historical Aerial Photography

Auckland Council GeoMaps

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Appendix E

Auckland Council Contamination Enquiry

29 April 2022

Geotechnical Engineering Limited
PO Box 21424
AUCKLAND 0650

Attention: Lisa Pole

Dear Lisa

Site Contamination Enquiry- Multiple Addresses, Riverhead

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.

Council's records indicate this site has possibly been subject to the following activity that falls within the HAIL:

- HAIL Item (A.10) - Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds

- HAIL Item (F.8) - Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances

- HAIL Item (G.3) - Landfill sites

- HAIL Item (G.5) - Waste disposal to land (excluding where biosolids have been used as soil Conditioners)

Council records indicate 1092, 1140,1156,1158,1170,1186, 1194 Coatesville–Riverhead Highway, 51, Lot 2 DP 164978 & Lot 2 DP 64605 Lathrope Road, 306, 307,325, 328, 340 Riverhead Road have been utilised for horticultural activities.

Council records indicate 1200 Coatesville–Riverhead Highway has been utilised for depot activities.

Aerial records indicate 30 Cambridge Road may have been utilised for horticultural activities,

additionally records indicate opening burning activities on site.

A report dated November 1992 indicated that since the mid-1970s 22 Duke Street had been utilised for landfilling activities. The landfill is approximately 5000m2 in size. Material within the landfill contains construction waste and debris from the Riverhead timber mill. Leachate discharge sampling indicated low levels of Nickel, Cadmium and Zinc. Additionally records indicate the between 2005 and 2020 further waste disposal to land has occurred on site. This includes but is not limited to broken concrete, fill material, general rubbish, treated timber and tyres.

Due to the age of the structures on the sites the potential for asbestos and/or lead paint may need to be considered

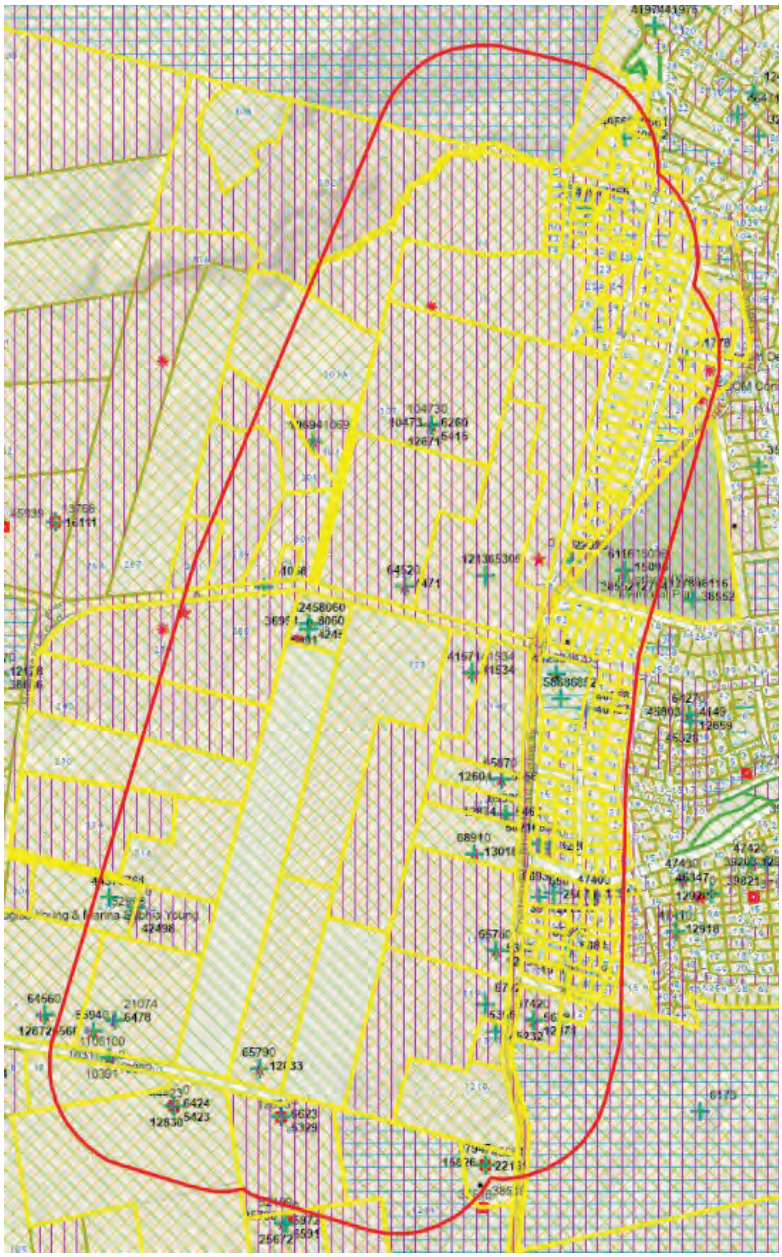
Please note:

- *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 the time involved in this enquiry will follow shortly.

Yours Sincerely,

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

Soil&Rock Consultants

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Appendix F

Sample Location Plan
(S&RC PSI&DSI, 2022)

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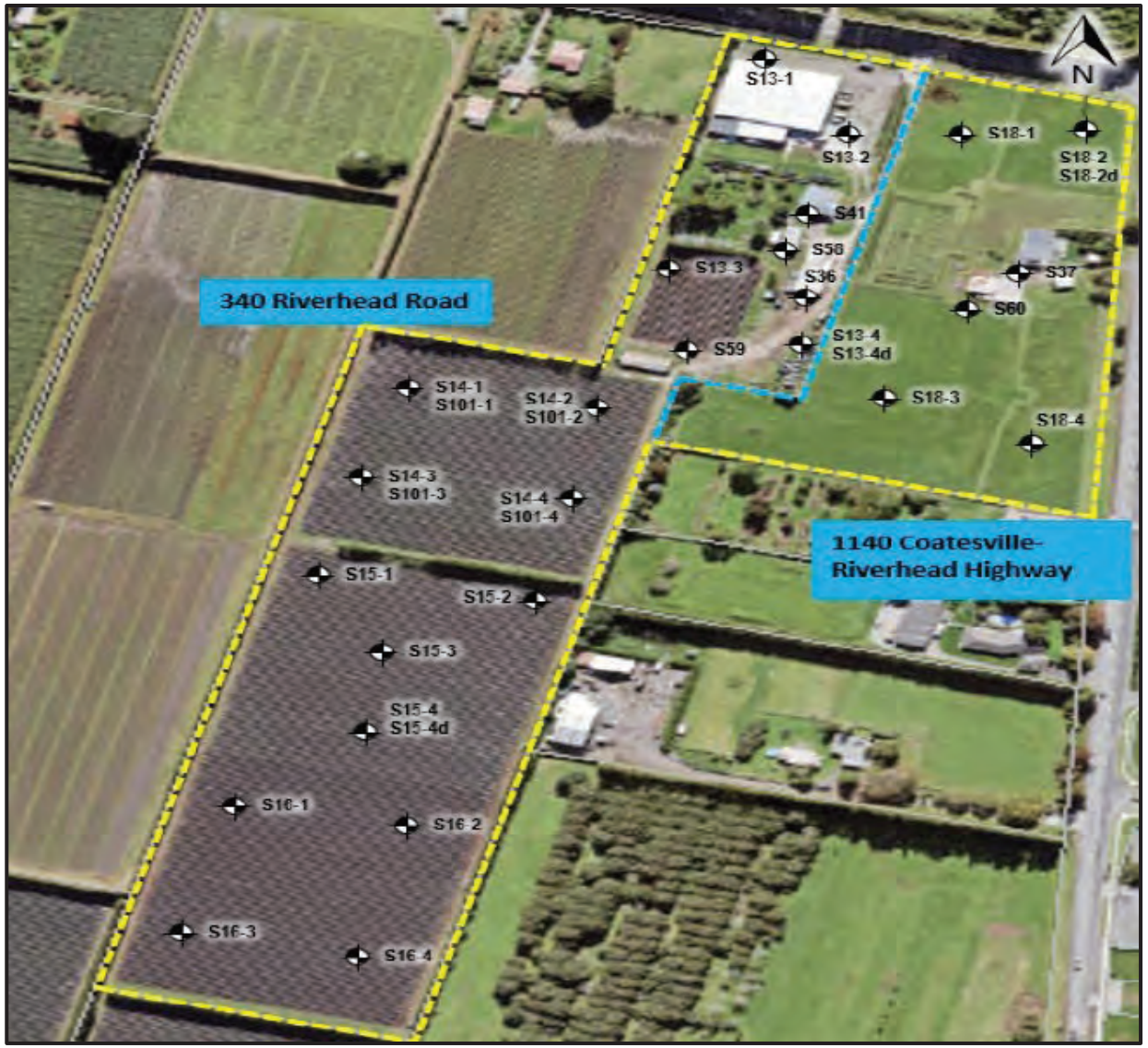

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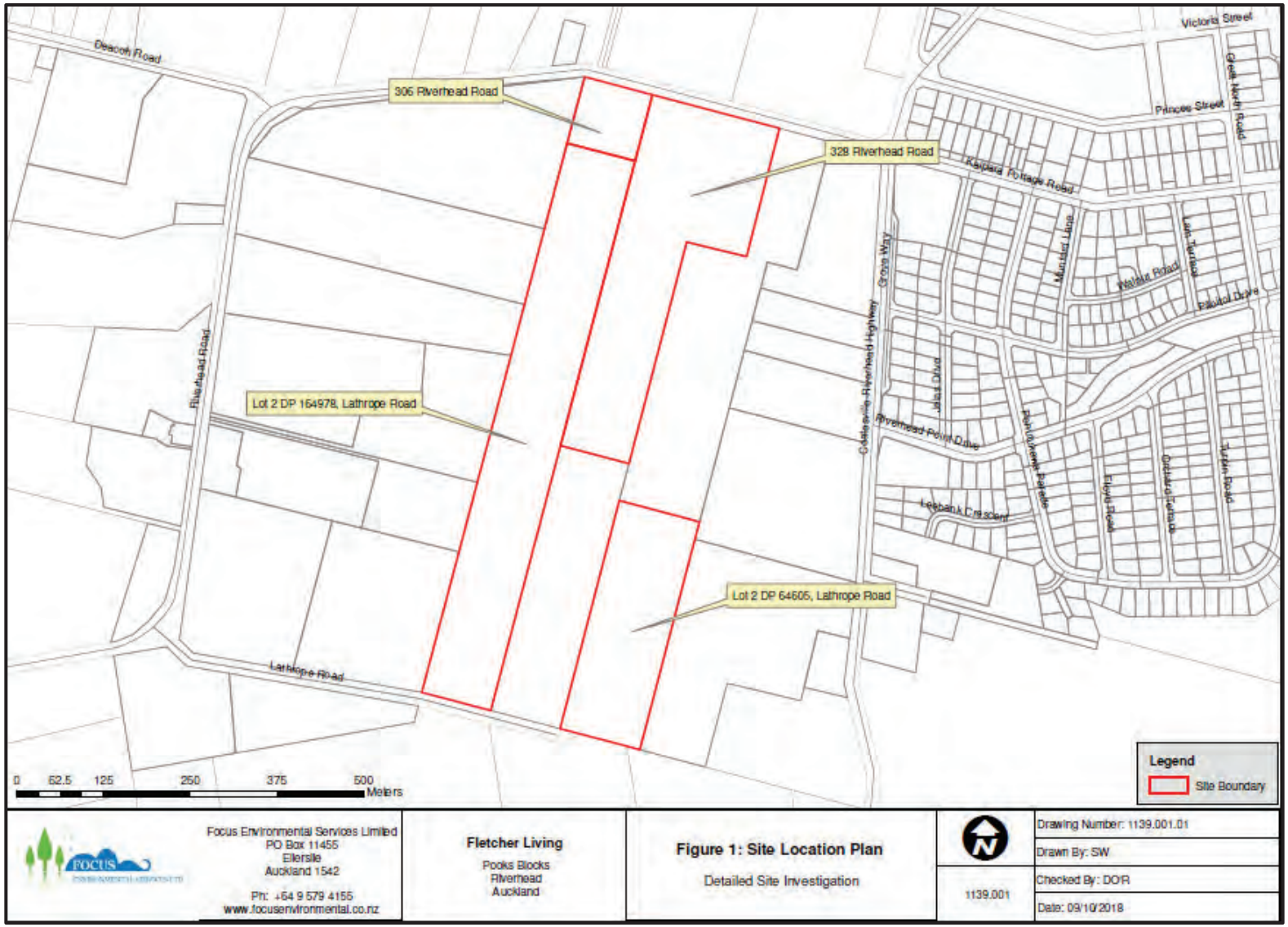
Appendix G

Sample Location Plan
(Focus Environmental Services DSI, 2022)



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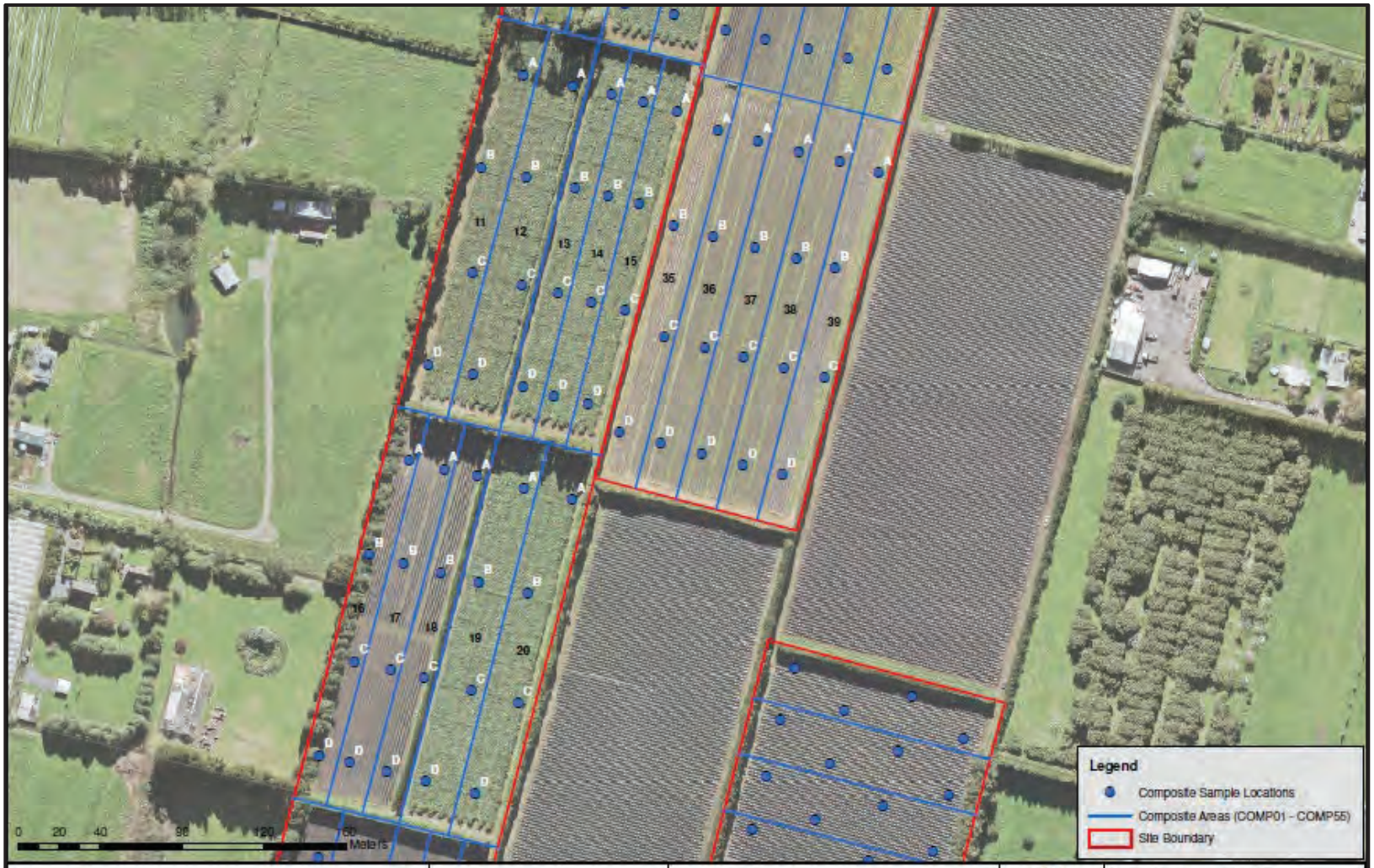

Focus Environmental Services Limited PO Box 11455 Ellerslie Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Fletcher Living Limited** Pooks Blocks Riverhead Auckland	**Figure 4-2: Sample Location Plan** Detailed Site Investigation	1139.001	Drawing Number: 1139.001.08 Drawn By: SD Checked By: DOR Date: 11/07/2017

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Focus Environmental Services Limited PO Box 11455 Ellerslie Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Fletcher Living Limited** Pooks Blocks Riverhead Auckland	**Figure 4-3: Sample Location Plan** Detailed Site Investigation	1139.001	Drawing Number: 1139.001.09 Drawn By: SD Checked By: DO'R Date: 11/07/2017

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Focus Environmental Services Limited PO Box 11455 Ellersile Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Fletcher Living Limited** Pooks Blocks Riverhead Auckland	**Figure 4-4: Sample Location Plan** Detailed Site Investigation	1139.001	Drawing Number: 1139.001.10 Drawn By: SD Checked By: DOR Date: 11/07/2017

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www.focusenvironmental.co.nz

Fletcher Living Limited

Pooks Blocks
Riverhead
Auckland

Figure 4-5: Sample Location Plan

Detailed Site Investigation

1139.001

Drawing Number: 1139.001.11
Drawn By: SD
Checked By: DO'R
Date: 11/07/2017

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Focus Environmental Services Limited PO Box 11455 Ellerslie Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Fletcher Living Limited** Pooks Blocks Riverhead Auckland	**Figure 4-6: Sample Location Plan** Detailed Site Investigation	1139.001	Drawing Number: 1139.001.12 Drawn By: SD Checked By: DOR Date: 11/07/2017

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Appendix H

Laboratory Analytical Results and Chain of Custody Documentation (S&RC PSI&DSI, 2022)

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Attention: **Jordan Vaughn**

Report **867691-S**
Project name
Project ID 21710
Received Date Mar 02, 2022

Client Sample ID			**COMPOSITE 19**	**S38**	**S39**	**S40**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Ma03395**	**K22-Ma03400**	**K22-Ma03401**	**K22-Ma03402**
Date Sampled			**Mar 01, 2022**	**Mar 01, 2022**	**Mar 01, 2022**	**Mar 01, 2022**
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.10	0.11	0.08	0.08
4.4'-DDD	0.01	mg/kg	0.03	0.01	0.03	0.01
4.4'-DDE	0.01	mg/kg	0.18	0.13	0.13	0.08
4.4'-DDT	0.01	mg/kg	0.17	0.20	0.14	0.04
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.48	0.46	0.38	0.21
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	0.03	0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	87	84	80	87
Tetrachloro-m-xylene (surr.)	1	%	91	96	82	86
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	3.6	11	3.9	11
Cadmium	0.01	mg/kg	0.67	0.64	0.36	0.32
Chromium	0.1	mg/kg	14	16	16	13
Copper	0.1	mg/kg	38	42	34	83
Lead	0.1	mg/kg	16	26	14	14

Client Sample ID			COMPOSITE 19	S38	S39	S40
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma03395	K22-Ma03400	K22-Ma03401	K22-Ma03402
Date Sampled			Mar 01, 2022	Mar 01, 2022	Mar 01, 2022	Mar 01, 2022
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.36	0.27	0.34	0.21
Nickel	0.1	mg/kg	5.2	5.7	11	8.0
Zinc	5	mg/kg	27	48	39	70
% Moisture	1	%	29	29	20	21
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	-	< 20	< 20	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	-	< 35	< 35	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	0.08	0.08	0.07
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03	0.04
Fluorene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Pyrene	0.03	mg/kg	-	< 0.03	< 0.03	0.05
p-Terphenyl-d14 (surr.)	1	%	-	65	INT	57
2-Fluorobiphenyl (surr.)	1	%	-	93	71	88

Client Sample ID			S47	S61	S65	S66
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma03403	K22-Ma03404	K22-Ma03405	K22-Ma03406
Date Sampled			Mar 01, 2022	Mar 01, 2022	Mar 01, 2022	Mar 01, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	-	-	-
2.4'-DDE	0.01	mg/kg	< 0.01	-	-	-
2.4'-DDT	0.01	mg/kg	0.01	-	-	-
4.4'-DDD	0.01	mg/kg	< 0.01	-	-	-
4.4'-DDE	0.01	mg/kg	0.01	-	-	-
4.4'-DDT	0.01	mg/kg	< 0.01	-	-	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.02	-	-	-
a-HCH	0.01	mg/kg	< 0.01	-	-	-

Client Sample ID			S47	S61	S65	S66
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma03403	K22-Ma03404	K22-Ma03405	K22-Ma03406
Date Sampled			Mar 01, 2022	Mar 01, 2022	Mar 01, 2022	Mar 01, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Aldrin	0.01	mg/kg	< 0.01	-	-	-
b-HCH	0.01	mg/kg	< 0.01	-	-	-
Chlordanes - Total	0.01	mg/kg	< 0.01	-	-	-
cis-Chlordane	0.01	mg/kg	< 0.01	-	-	-
d-HCH	0.01	mg/kg	< 0.01	-	-	-
Dieldrin	0.01	mg/kg	< 0.01	-	-	-
Endosulfan I	0.01	mg/kg	< 0.01	-	-	-
Endosulfan II	0.01	mg/kg	< 0.01	-	-	-
Endosulfan sulphate	0.01	mg/kg	< 0.01	-	-	-
Endrin	0.01	mg/kg	< 0.01	-	-	-
Endrin aldehyde	0.01	mg/kg	< 0.01	-	-	-
Endrin ketone	0.01	mg/kg	< 0.01	-	-	-
g-HCH (Lindane)	0.01	mg/kg	< 0.01	-	-	-
Heptachlor	0.01	mg/kg	< 0.01	-	-	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	-	-	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	-	-	-
Methoxychlor	0.01	mg/kg	< 0.01	-	-	-
Toxaphene	0.5	mg/kg	< 0.5	-	-	-
trans-Chlordane	0.01	mg/kg	< 0.01	-	-	-
Dibutylchlorendate (surr.)	1	%	101	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	94	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	130	6.1	18	10
Cadmium	0.01	mg/kg	0.28	0.53	0.13	0.19
Chromium	0.1	mg/kg	72	13	31	15
Copper	0.1	mg/kg	130	37	43	56
Lead	0.1	mg/kg	1200	13	17	36
Mercury	0.01	mg/kg	0.07	0.22	0.20	0.29
Nickel	0.1	mg/kg	42	10.0	72	5.1
Zinc	5	mg/kg	190	56	170	84
% Moisture	1	%	11	35	20	33
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	-	-	-
TPH-SG C10-C14	10	mg/kg	< 10	-	-	-
TPH-SG C15-C36	20	mg/kg	82	-	-	-
TPH-SG C7-C36 (Total)	35	mg/kg	82	-	-	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	-	-	-
Acenaphthylene	0.03	mg/kg	0.03	-	-	-
Anthracene	0.03	mg/kg	0.06	-	-	-
Benz(a)anthracene	0.03	mg/kg	0.13	-	-	-
Benzo(a)pyrene	0.03	mg/kg	0.09	-	-	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	0.13	-	-	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.15	-	-	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.17	-	-	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	0.10	-	-	-
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	-	-	-
Benzo(k)fluoranthene	0.03	mg/kg	0.15	-	-	-

Client Sample ID			S47	S61	S65	S66
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma03403	K22-Ma03404	K22-Ma03405	K22-Ma03406
Date Sampled			Mar 01, 2022	Mar 01, 2022	Mar 01, 2022	Mar 01, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Chrysene	0.03	mg/kg	0.12	-	-	-
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	-	-	-
Fluoranthene	0.03	mg/kg	0.48	-	-	-
Fluorene	0.03	mg/kg	< 0.03	-	-	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	-	-	-
Naphthalene	0.1	mg/kg	< 0.1	-	-	-
Phenanthrene	0.03	mg/kg	0.37	-	-	-
Pyrene	0.03	mg/kg	0.51	-	-	-
p-Terphenyl-d14 (surr.)	1	%	62	-	-	-
2-Fluorobiphenyl (surr.)	1	%	84	-	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Mar 02, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Mar 03, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Mar 02, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Mar 03, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Mar 03, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			

eurofins | Environment Testing

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Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867691
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 2, 2022 8:00 AM
Due: Mar 9, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											X
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMPOSITE 19	Mar 01, 2022		Soil	K22-Ma03395		X	X	X		
2	S19-1	Mar 01, 2022		Soil	K22-Ma03396	X					
3	S19-2	Mar 01, 2022		Soil	K22-Ma03397	X					
4	S19-3	Mar 01, 2022		Soil	K22-Ma03398	X					
5	S19-4	Mar 01, 2022		Soil	K22-Ma03399	X					
6	S38	Mar 01, 2022		Soil	K22-Ma03400		X	X		X	X
7	S39	Mar 01, 2022		Soil	K22-Ma03401		X	X		X	X
8	S40	Mar 01, 2022		Soil	K22-Ma03402		X	X		X	X
9	S47	Mar 01, 2022		Soil	K22-Ma03403		X	X		X	X
10	S61	Mar 01, 2022		Soil	K22-Ma03404		X				X
11	S65	Mar 01, 2022		Soil	K22-Ma03405		X				X

eurofins | Environment Testing

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Project Name:
Project ID: 21710

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Report #: 867691
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Received: Mar 2, 2022 8:00 AM
Due: Mar 9, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

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Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											X
External Laboratory											
12	S66	Mar 01, 2022		Soil	K22-Ma03406		X				X
Test Counts						4	8	5	1	4	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	124			70-130	Pass	
2.4'-DDE	%	117			70-130	Pass	
2.4'-DDT	%	120			70-130	Pass	
4.4'-DDD	%	123			70-130	Pass	
4.4'-DDE	%	121			70-130	Pass	
4.4'-DDT	%	128			70-130	Pass	
a-HCH	%	103			70-130	Pass	
Aldrin	%	106			70-130	Pass	
b-HCH	%	98			70-130	Pass	
Chlordanes - Total	%	123			70-130	Pass	
cis-Chlordane	%	124			70-130	Pass	
d-HCH	%	106			70-130	Pass	
Dieldrin	%	125			70-130	Pass	
Endosulfan I	%	98			70-130	Pass	
Endosulfan II	%	101			70-130	Pass	
Endosulfan sulphate	%	113			70-130	Pass	
Endrin	%	108			70-130	Pass	
Endrin aldehyde	%	107			70-130	Pass	
Endrin ketone	%	76			70-130	Pass	
g-HCH (Lindane)	%	100			70-130	Pass	
Heptachlor	%	110			70-130	Pass	
Heptachlor epoxide	%	120			70-130	Pass	
Hexachlorobenzene	%	112			70-130	Pass	
Methoxychlor	%	129			70-130	Pass	
trans-Chlordane	%	122			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	102			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	105			80-120	Pass	
Copper	%	104			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	105			80-120	Pass	
Nickel	%	104			80-120	Pass	
Zinc	%	113			80-120	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	114			70-130	Pass	
Acenaphthylene	%	125			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	123			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	96			70-130	Pass	
Benzo(b&j)fluoranthene	%	90			70-130	Pass	
Benzo(g.h.i)perylene	%	71			70-130	Pass	
Benzo(k)fluoranthene	%	101			70-130	Pass	
Chrysene	%	99			70-130	Pass	
Dibenz(a.h)anthracene	%	100			70-130	Pass	
Fluoranthene	%	118			70-130	Pass	
Fluorene	%	122			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	97			70-130	Pass	
Naphthalene	%	111			70-130	Pass	
Phenanthrene	%	124			70-130	Pass	
Pyrene	%	119			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ma00491	NCP	%	120			70-130	Pass	
2.4'-DDT	K22-Ma00491	NCP	%	129			70-130	Pass	
Endrin aldehyde	K22-Ma00491	NCP	%	74			70-130	Pass	
g-HCH (Lindane)	K22-Ma00491	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Ma05806	NCP	%	123			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Dibenz(a.h)anthracene	K22-Ma00491	NCP	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ma00491	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDE	K22-Ma03402	CP	%	105			70-130	Pass	
4.4'-DDD	K22-Ma03402	CP	%	117			70-130	Pass	
4.4'-DDE	K22-Ma03402	CP	%	104			70-130	Pass	
4.4'-DDT	K22-Ma03402	CP	%	110			70-130	Pass	
a-HCH	K22-Ma03402	CP	%	98			70-130	Pass	
Aldrin	K22-Ma03402	CP	%	88			70-130	Pass	
b-HCH	K22-Ma03402	CP	%	93			70-130	Pass	
Chlordanes - Total	K22-Ma03402	CP	%	113			70-130	Pass	
cis-Chlordane	K22-Ma03402	CP	%	116			70-130	Pass	
d-HCH	K22-Ma03402	CP	%	99			70-130	Pass	
Dieldrin	K22-Ma03402	CP	%	123			70-130	Pass	
Endosulfan I	K22-Ma03402	CP	%	114			70-130	Pass	
Endosulfan II	K22-Ma03402	CP	%	119			70-130	Pass	
Endosulfan sulphate	K22-Ma03402	CP	%	129			70-130	Pass	
Endrin	K22-Ma03402	CP	%	106			70-130	Pass	
Endrin ketone	K22-Ma03402	CP	%	73			70-130	Pass	
Heptachlor	K22-Ma03402	CP	%	113			70-130	Pass	
Heptachlor epoxide	K22-Ma03402	CP	%	89			70-130	Pass	
Hexachlorobenzene	K22-Ma03402	CP	%	82			70-130	Pass	
Methoxychlor	K22-Ma03402	CP	%	122			70-130	Pass	
trans-Chlordane	K22-Ma03402	CP	%	110			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Ma03402	CP	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	K22-Ma03402	CP	%	90			70-130	Pass	
Anthracene	K22-Ma03402	CP	%	109			70-130	Pass	
Benz(a)anthracene	K22-Ma03402	CP	%	74			70-130	Pass	
Benzo(a)pyrene	K22-Ma03402	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Ma03402	CP	%	106			70-130	Pass	
Benzo(k)fluoranthene	K22-Ma03402	CP	%	112			70-130	Pass	
Chrysene	K22-Ma03402	CP	%	81			70-130	Pass	
Fluoranthene	K22-Ma03402	CP	%	109			70-130	Pass	
Fluorene	K22-Ma03402	CP	%	97			70-130	Pass	
Naphthalene	K22-Ma03402	CP	%	84			70-130	Pass	
Phenanthrene	K22-Ma03402	CP	%	97			70-130	Pass	
Pyrene	K22-Ma03402	CP	%	116			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ma03404	CP	%	88			75-125	Pass	
Cadmium	K22-Ma03404	CP	%	97			75-125	Pass	
Chromium	K22-Ma03404	CP	%	102			75-125	Pass	
Copper	K22-Ma03404	CP	%	95			75-125	Pass	
Lead	K22-Ma03404	CP	%	99			75-125	Pass	
Mercury	K22-Ma03404	CP	%	109			75-125	Pass	
Nickel	K22-Ma03404	CP	%	97			75-125	Pass	
Zinc	K22-Ma03404	CP	%	111			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Ma05805	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Ma05805	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Ma05805	NCP	mg/kg	640	680	6.0	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Ma05805	NCP	mg/kg	640	680	6.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthylene	K22-Ma00490	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Ma00490	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K22-Ma03401	CP	mg/kg	0.08	0.08	<1	30%	Pass	
4.4'-DDD	K22-Ma03401	CP	mg/kg	0.03	0.01	26	30%	Pass	
4.4'-DDE	K22-Ma03401	CP	mg/kg	0.13	0.11	10	30%	Pass	
4.4'-DDT	K22-Ma03401	CP	mg/kg	0.14	0.11	23	30%	Pass	
a-HCH	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
g-HCH (Lindane)	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ma03401	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ma03401	CP	%	20	21	4.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Phenanthrene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ma03401	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ma03403	CP	mg/kg	130	140	9.0	30%	Pass	
Cadmium	K22-Ma03403	CP	mg/kg	0.28	0.34	17	30%	Pass	
Chromium	K22-Ma03403	CP	mg/kg	72	75	5.0	30%	Pass	
Copper	K22-Ma03403	CP	mg/kg	130	420	110	30%	Fail	Q02
Lead	K22-Ma03403	CP	mg/kg	1200	920	25	30%	Pass	
Mercury	K22-Ma03403	CP	mg/kg	0.07	0.08	9.0	30%	Pass	
Nickel	K22-Ma03403	CP	mg/kg	42	34	21	30%	Pass	
Zinc	K22-Ma03403	CP	mg/kg	190	190	3.0	30%	Pass	

Comments

Eurofins | Environment Testing accreditation number 1261, site 18217 is currently in progress of a controlled transition to a new custom built location at 179 Magowar Road, Girraween, NSW 2145. All results on this report denoted as being performed by Eurofins | Environment Testing Unit F3, Building F, 16 Mars road, Lane Cove West, NSW 2066, corporate site 18217, will have been performed on either Lane Cove or new Girraween site

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Karishma Patel	Analytical Services Manager
Daren Yang	Senior Analyst-Organic (NZN)
Michael Ritchie	Senior Analyst-Metal (NZN)
Michael Ritchie	Senior Analyst-Organic (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention: **Jordan Vaughn**

Report **872192-S**
Project name
Project ID 21710
Received Date Mar 17, 2022

Client Sample ID			**S19-1**	**S19-2**	**S19-3**	**S19-4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Ma35607**	**K22-Ma35608**	**K22-Ma35609**	**K22-Ma35610**
Date Sampled			**Mar 01, 2022**	**Mar 01, 2022**	**Mar 01, 2022**	**Mar 01, 2022**
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	4.4	4.9	4.1	3.7
Cadmium	0.01	mg/kg	0.71	0.78	0.77	0.72
Chromium	0.1	mg/kg	12	11	12	15
Copper	0.1	mg/kg	36	35	43	38
Lead	0.1	mg/kg	18	15	18	15
Mercury	0.01	mg/kg	0.37	0.30	0.39	0.36
Nickel	0.1	mg/kg	4.9	4.3	4.9	4.5
Zinc	5	mg/kg	19	37	26	13
% Moisture	1	%	28	27	30	30

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8 (NZ MfE)	Auckland	Mar 18, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Mar 18, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

eurofins | Environment Testing

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 872192
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 17, 2022 1:15 PM
Due: Mar 24, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Moisture Set	Metals M8 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X
Christchurch Laboratory - IANZ# 1290							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	S19-1	Mar 01, 2022		Soil	K22-Ma35607	X	X
2	S19-2	Mar 01, 2022		Soil	K22-Ma35608	X	X
3	S19-3	Mar 01, 2022		Soil	K22-Ma35609	X	X
4	S19-4	Mar 01, 2022		Soil	K22-Ma35610	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	108			80-120	Pass	
Cadmium	%	105			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	102			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	106			80-120	Pass	
Nickel	%	104			80-120	Pass	
Zinc	%	108			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ma27531	NCP	%	99			75-125	Pass	
Cadmium	K22-Ma27531	NCP	%	95			75-125	Pass	
Chromium	K22-Ma27531	NCP	%	85			75-125	Pass	
Copper	K22-Ma27531	NCP	%	86			75-125	Pass	
Lead	K22-Ma27531	NCP	%	81			75-125	Pass	
Mercury	K22-Ma27531	NCP	%	102			75-125	Pass	
Nickel	K22-Ma27531	NCP	%	90			75-125	Pass	
Zinc	K22-Ma27521	NCP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ma36156	NCP	mg/kg	22	20	10	30%	Pass	
Cadmium	K22-Ma36156	NCP	mg/kg	0.54	0.50	7.0	30%	Pass	
Chromium	K22-Ma36156	NCP	mg/kg	48	48	1.0	30%	Pass	
Copper	K22-Ma36156	NCP	mg/kg	49	48	1.0	30%	Pass	
Lead	K22-Ma36156	NCP	mg/kg	390	360	7.0	30%	Pass	
Mercury	K22-Ma36156	NCP	mg/kg	0.29	0.28	4.0	30%	Pass	
Nickel	K22-Ma36156	NCP	mg/kg	43	42	2.0	30%	Pass	
Zinc	K22-Ma36156	NCP	mg/kg	480	440	9.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ma35607	CP	%	28	27	2.0	30%	Pass	

Comments

Eurofins | Environment Testing accreditation number 1261, site 18217 is currently in progress of a controlled transition to a new custom built location at 179 Magowar Road, Girraween, NSW 2145. All results on this report denoted as being performed by Eurofins | Environment Testing Unit F3, Building F, 16 Mars road, Lane Cove West, NSW 2066, corporate site 18217, will have been performed on either Lane Cove or new Girraween site

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Metal (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention: **Jordan Vaughn**

Report **877177-S**
Project name
Project ID 21529
Received Date Apr 05, 2022

Client Sample ID			COMP S25	COMP S26	S25-2D	S46
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ap0006779	K22-Ap0006780	K22-Ap0006781	K22-Ap0006782
Date Sampled			Apr 04, 2022	Apr 04, 2022	Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.05	0.02	< 0.01	0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.28	0.08	< 0.01	0.06
4.4'-DDD	0.01	mg/kg	0.43	0.09	< 0.01	0.07
4.4'-DDE	0.01	mg/kg	0.45	0.12	< 0.01	0.10
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	1.2	0.31	< 0.01	0.24
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	0.02	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	0.02	< 0.01	0.05	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.02	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	0.02	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	INT	INT	INT	INT
Tetrachloro-m-xylene (surr.)	1	%	96	INT	88	98
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	8.0	9.0	7.9	18
Cadmium	0.01	mg/kg	0.43	0.32	0.03	0.49
Chromium	0.1	mg/kg	12	16	21	17
Copper	0.1	mg/kg	77	42	15	93
Lead	0.1	mg/kg	23	29	20	19

Client Sample ID			COMP S25	COMP S26	S25-2D	S46
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ap0006779	K22-Ap0006780	K22-Ap0006781	K22-Ap0006782
Date Sampled			Apr 04, 2022	Apr 04, 2022	Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.44	0.46	0.44	0.37
Nickel	0.1	mg/kg	4.9	7.3	9.1	6.8
Zinc	5	mg/kg	33	26	9.3	110
% Moisture	1	%	33	33	60	31
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	-	-	< 5
TPH-SG C10-C14	10	mg/kg	-	-	-	< 10
TPH-SG C15-C36	20	mg/kg	-	-	-	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	-	-	-	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	-	-	< 0.03
Acenaphthylene	0.03	mg/kg	-	-	-	< 0.03
Anthracene	0.03	mg/kg	-	-	-	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	-	-	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	-	-	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	-	-	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	-	-	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	-	-	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	-	-	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	-	-	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	-	-	< 0.03
Chrysene	0.03	mg/kg	-	-	-	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	-	-	< 0.03
Fluoranthene	0.03	mg/kg	-	-	-	< 0.03
Fluorene	0.03	mg/kg	-	-	-	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	-	-	< 0.03
Naphthalene	0.1	mg/kg	-	-	-	< 0.1
Phenanthrene	0.03	mg/kg	-	-	-	< 0.03
Pyrene	0.03	mg/kg	-	-	-	< 0.03
p-Terphenyl-d14 (surr.)	1	%	-	-	-	84
2-Fluorobiphenyl (surr.)	1	%	-	-	-	95

Client Sample ID			S47	S64
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ap0006783	K22-Ap0006784
Date Sampled			Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides (NZ MfE)				
2.4'-DDD	0.01	mg/kg	< 0.01	-
2.4'-DDE	0.01	mg/kg	< 0.01	-
2.4'-DDT	0.01	mg/kg	0.03	-
4.4'-DDD	0.01	mg/kg	0.03	-
4.4'-DDE	0.01	mg/kg	0.06	-
4.4'-DDT	0.01	mg/kg	< 0.01	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.12	-
a-HCH	0.01	mg/kg	< 0.01	-

Client Sample ID			S47	S64
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ap0006783	K22-Ap0006784
Date Sampled			Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides (NZ MfE)				
Aldrin	0.01	mg/kg	< 0.01	-
b-HCH	0.01	mg/kg	< 0.01	-
Chlordanes - Total	0.01	mg/kg	< 0.01	-
cis-Chlordane	0.01	mg/kg	< 0.01	-
d-HCH	0.01	mg/kg	< 0.01	-
Dieldrin	0.01	mg/kg	< 0.01	-
Endosulfan I	0.01	mg/kg	0.02	-
Endosulfan II	0.01	mg/kg	< 0.01	-
Endosulfan sulphate	0.01	mg/kg	< 0.01	-
Endrin	0.01	mg/kg	0.02	-
Endrin aldehyde	0.01	mg/kg	< 0.01	-
Endrin ketone	0.01	mg/kg	< 0.01	-
g-HCH (Lindane)	0.01	mg/kg	< 0.01	-
Heptachlor	0.01	mg/kg	< 0.01	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	-
Methoxychlor	0.01	mg/kg	< 0.01	-
Toxaphene	0.5	mg/kg	< 0.5	-
trans-Chlordane	0.01	mg/kg	< 0.01	-
Dibutylchlorendate (surr.)	1	%	INT	-
Tetrachloro-m-xylene (surr.)	1	%	99	-
Metals M8 (NZ MfE)				
Arsenic	0.1	mg/kg	7.9	9.6
Cadmium	0.01	mg/kg	0.32	0.32
Chromium	0.1	mg/kg	17	19
Copper	0.1	mg/kg	32	73
Lead	0.1	mg/kg	29	32
Mercury	0.01	mg/kg	0.29	0.41
Nickel	0.1	mg/kg	6.3	11
Zinc	5	mg/kg	59	1300
% Moisture	1	%	34	36
Total Petroleum Hydrocarbons (NZ MfE 1999)				
TPH-SG C7-C9	5	mg/kg	< 5	-
TPH-SG C10-C14	10	mg/kg	< 10	-
TPH-SG C15-C36	20	mg/kg	< 20	-
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)				
Acenaphthene	0.03	mg/kg	< 0.03	-
Acenaphthylene	0.03	mg/kg	< 0.03	-
Anthracene	0.03	mg/kg	< 0.03	-
Benz(a)anthracene	0.03	mg/kg	0.08	-
Benzo(a)pyrene	0.03	mg/kg	0.08	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	0.14	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.14	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.14	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	0.05	-
Benzo(g.h.i)perylene	0.03	mg/kg	0.05	-

Client Sample ID			S47	S64
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ap0006783	K22-Ap0006784
Date Sampled			Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons (NZ MfE)				
Benzo(k)fluoranthene	0.03	mg/kg	0.06	-
Chrysene	0.03	mg/kg	0.08	-
Dibenz(a.h)anthracene	0.03	mg/kg	0.03	-
Fluoranthene	0.03	mg/kg	0.08	-
Fluorene	0.03	mg/kg	< 0.03	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	0.05	-
Naphthalene	0.1	mg/kg	< 0.1	-
Phenanthrene	0.03	mg/kg	< 0.03	-
Pyrene	0.03	mg/kg	0.08	-
p-Terphenyl-d14 (surr.)	1	%	82	-
2-Fluorobiphenyl (surr.)	1	%	99	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Apr 05, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Apr 07, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Apr 05, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Apr 07, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Apr 07, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			

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Company Name: Soil & Rock Consultants
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NEW ZEALAND

Project Name:
Project ID: 21529

Order No.:
Report #: 877177
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Apr 5, 2022 1:01 PM
Due: Apr 12, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMP S25	Apr 04, 2022		Soil	K22-Ap0006779		X	X	X		
2	COMP S26	Apr 04, 2022		Soil	K22-Ap0006780		X	X	X		
3	S25-2D	Apr 04, 2022		Soil	K22-Ap0006781		X	X	X		
4	S46	Apr 04, 2022		Soil	K22-Ap0006782		X	X	X	X	
5	S47	Apr 04, 2022		Soil	K22-Ap0006783		X	X		X	X
6	S64	Apr 04, 2022		Soil	K22-Ap0006784		X				X
7	S25-1	Apr 04, 2022		Soil	K22-Ap0006785	X					

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Project Name:
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Order No.:
Report #: 877177
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Apr 5, 2022 1:01 PM
Due: Apr 12, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
8	S25-2	Apr 04, 2022		Soil	K22-Ap0006786	X					
9	S25-3	Apr 04, 2022		Soil	K22-Ap0006787	X					
10	S25-4	Apr 04, 2022		Soil	K22-Ap0006788	X					
11	S26-1	Apr 04, 2022		Soil	K22-Ap0006789	X					
12	S26-2	Apr 04, 2022		Soil	K22-Ap0006790	X					
13	S26-3	Apr 04, 2022		Soil	K22-Ap0006791	X					
14	S26-4	Apr 04, 2022		Soil	K22-Ap0006792	X					
Test Counts						8	6	5	4	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	127			70-130	Pass	
2.4'-DDE	%	84			70-130	Pass	
2.4'-DDT	%	108			70-130	Pass	
4.4'-DDD	%	89			70-130	Pass	
4.4'-DDE	%	116			70-130	Pass	
4.4'-DDT	%	72			70-130	Pass	
a-HCH	%	84			70-130	Pass	
Aldrin	%	106			70-130	Pass	
b-HCH	%	84			70-130	Pass	
Chlordanes - Total	%	97			70-130	Pass	
cis-Chlordane	%	102			70-130	Pass	
d-HCH	%	72			70-130	Pass	
Dieldrin	%	109			70-130	Pass	
Endosulfan I	%	119			70-130	Pass	
Endosulfan II	%	120			70-130	Pass	
Endosulfan sulphate	%	120			70-130	Pass	
Endrin	%	128			70-130	Pass	
Endrin aldehyde	%	74			70-130	Pass	
Endrin ketone	%	83			70-130	Pass	
g-HCH (Lindane)	%	103			70-130	Pass	
Heptachlor	%	85			70-130	Pass	
Heptachlor epoxide	%	124			70-130	Pass	
Hexachlorobenzene	%	87			70-130	Pass	
Methoxychlor	%	71			70-130	Pass	
trans-Chlordane	%	92			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	105			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	112			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	106			80-120	Pass	
Mercury	%	116			80-120	Pass	
Nickel	%	110			80-120	Pass	
Zinc	%	113			80-120	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	130			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	96			70-130	Pass	
Acenaphthylene	%	107			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	129			70-130	Pass	
Benz(a)anthracene	%	128			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	82			70-130	Pass	
Benzo(g.h.i)perylene	%	117			70-130	Pass	
Benzo(k)fluoranthene	%	104			70-130	Pass	
Chrysene	%	117			70-130	Pass	
Dibenz(a.h)anthracene	%	117			70-130	Pass	
Fluoranthene	%	130			70-130	Pass	
Fluorene	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	118			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	94			70-130	Pass	
Pyrene	%	123			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ap0002833	NCP	%	85			70-130	Pass	
2.4'-DDE	K22-Ap0013260	NCP	%	97			70-130	Pass	
2.4'-DDT	K22-Ap0013260	NCP	%	109			70-130	Pass	
4.4'-DDD	K22-Ap0002833	NCP	%	107			70-130	Pass	
4.4'-DDE	K22-Ap0013260	NCP	%	96			70-130	Pass	
4.4'-DDT	K22-Ap0002833	NCP	%	72			70-130	Pass	
a-HCH	K22-Ap0013260	NCP	%	93			70-130	Pass	
Aldrin	K22-Ap0013260	NCP	%	112			70-130	Pass	
b-HCH	K22-Ap0013260	NCP	%	129			70-130	Pass	
Chlordanes - Total	K22-Ap0013260	NCP	%	114			70-130	Pass	
cis-Chlordane	K22-Ap0013260	NCP	%	118			70-130	Pass	
d-HCH	K22-Ap0013260	NCP	%	86			70-130	Pass	
Dieldrin	K22-Ap0013260	NCP	%	126			70-130	Pass	
Endosulfan I	K22-Ap0010391	NCP	%	126			70-130	Pass	
Endosulfan II	K22-Ap0010391	NCP	%	129			70-130	Pass	
Endosulfan sulphate	K22-Ap0002833	NCP	%	103			70-130	Pass	
Endrin	K22-Ap0010391	NCP	%	125			70-130	Pass	
Endrin aldehyde	K22-Ap0013260	NCP	%	70			70-130	Pass	
Endrin ketone	K22-Ap0013260	NCP	%	106			70-130	Pass	
g-HCH (Lindane)	K22-Ap0013260	NCP	%	119			70-130	Pass	
Heptachlor	K22-Ap0013260	NCP	%	106			70-130	Pass	
Heptachlor epoxide	K22-Ap0002833	NCP	%	105			70-130	Pass	
Hexachlorobenzene	K22-Ap0006046	NCP	%	96			70-130	Pass	
Methoxychlor	K22-Ap0002833	NCP	%	71			70-130	Pass	
trans-Chlordane	K22-Ap0013260	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ap0006779	CP	%	97			75-125	Pass	
Cadmium	K22-Ap0006779	CP	%	92			75-125	Pass	
Chromium	K22-Ap0006779	CP	%	100			75-125	Pass	
Copper	K22-Ap0006779	CP	%	81			75-125	Pass	
Lead	K22-Ap0006779	CP	%	96			75-125	Pass	
Mercury	K22-Ap0006779	CP	%	108			75-125	Pass	
Nickel	K22-Ap0006779	CP	%	98			75-125	Pass	
Zinc	K22-Ap0006779	CP	%	96			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	K22-Ap0010391	NCP	%	99			70-130	Pass	
Acenaphthylene	K22-Ap0010391	NCP	%	110			70-130	Pass	
Anthracene	Z22-Ap0003547	NCP	%	116			70-130	Pass	
Benz(a)anthracene	K22-Ap0010391	NCP	%	116			70-130	Pass	
Benzo(a)pyrene	K22-Ap0010391	NCP	%	113			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Ap0010391	NCP	%	102			70-130	Pass	
Benzo(g.h.i)perylene	K22-Ap0010391	NCP	%	97			70-130	Pass	
Benzo(k)fluoranthene	K22-Ap0010391	NCP	%	107			70-130	Pass	
Chrysene	K22-Ap0010391	NCP	%	118			70-130	Pass	
Dibenz(a.h)anthracene	K22-Ap0010391	NCP	%	126			70-130	Pass	
Fluoranthene	K22-Ap0010391	NCP	%	120			70-130	Pass	
Fluorene	K22-Ap0010391	NCP	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ap0010391	NCP	%	124			70-130	Pass	
Naphthalene	K22-Ap0010391	NCP	%	86			70-130	Pass	
Phenanthrene	K22-Ap0010391	NCP	%	84			70-130	Pass	
Pyrene	K22-Ap0010391	NCP	%	121			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Ap0006783	CP	%	100			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-HCH	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K22-Ap0010390	NCP	mg/kg	< 0.01	0.02	200	30%	Fail	Q15
Endrin aldehyde	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ap0010390	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ap0013263	NCP	mg/kg	3.6	3.7	4.0	30%	Pass	
Cadmium	K22-Ap0013263	NCP	mg/kg	0.17	0.19	9.0	30%	Pass	
Chromium	K22-Ap0013263	NCP	mg/kg	32	32	1.0	30%	Pass	
Copper	K22-Ap0013263	NCP	mg/kg	15	14	2.0	30%	Pass	
Lead	K22-Ap0013263	NCP	mg/kg	11	11	8.0	30%	Pass	

Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Mercury	K22-Ap0013263	NCP	mg/kg	0.04	0.04	6.0	30%	Pass	
Nickel	K22-Ap0013263	NCP	mg/kg	32	32	1.0	30%	Pass	
Zinc	K22-Ap0013263	NCP	mg/kg	64	62	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ap0006780	CP	%	33	33	1.0	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Ap0006782	CP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Ap0006782	CP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Ap0006782	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Ap0006782	CP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ap0010390	NCP	mg/kg	0.05	0.04	53	30%	Fail	Q15
Benzo(a)pyrene	K22-Ap0010390	NCP	mg/kg	0.05	< 0.03	79	30%	Fail	Q15
Benzo(b&j)fluoranthene	K22-Ap0010390	NCP	mg/kg	0.05	< 0.03	93	30%	Fail	Q15
Benzo(g.h.i)perylene	K22-Ap0010390	NCP	mg/kg	0.05	< 0.03	61	30%	Fail	Q15
Benzo(k)fluoranthene	K22-Ap0010390	NCP	mg/kg	0.05	0.04	35	30%	Fail	Q15
Chrysene	K22-Ap0010390	NCP	mg/kg	0.08	0.06	31	30%	Fail	Q15
Dibenz(a.h)anthracene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ap0010390	NCP	mg/kg	0.06	0.04	29	30%	Pass	
Fluorene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ap0010390	NCP	mg/kg	0.05	< 0.03	39	30%	Fail	Q15
Naphthalene	K22-Ap0010390	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Ap0010390	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ap0010390	NCP	mg/kg	0.08	0.05	46	30%	Fail	Q15

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst
Kate Stuart	Senior Analyst (NZS)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention: **Jordan Vaughn**

Report **854398-S**
Project name 21710
Received Date Jan 11, 2022

Client Sample ID			S23-1	S23-2	S23-3	S23-4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ja04855	K22-Ja04856	K22-Ja04857	K22-Ja04858
Date Sampled			Jan 10, 2021	Jan 10, 2021	Jan 10, 2021	Jan 10, 2021
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	0.01	< 0.01
2.4'-DDE	0.01	mg/kg	0.11	0.10	0.05	0.06
2.4'-DDT	0.01	mg/kg	0.02	0.01	0.01	0.04
4.4'-DDD	0.01	mg/kg	0.02	0.01	0.01	0.01
4.4'-DDE	0.01	mg/kg	0.11	0.08	0.05	0.06
4.4'-DDT	0.01	mg/kg	0.11	0.07	0.01	0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.37	0.27	0.14	0.18
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	0.03	0.01	0.01
Endosulfan sulphate	0.01	mg/kg	0.03	0.03	0.01	0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	85	59	58	62
Tetrachloro-m-xylene (surr.)	1	%	117	127	128	124
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	12	11	9.1	9.3
Cadmium	0.01	mg/kg	0.78	0.78	0.78	0.85
Chromium	0.1	mg/kg	18	16	14	17
Copper	0.1	mg/kg	42	43	40	48
Lead	0.1	mg/kg	12	13	14	15
Mercury	0.01	mg/kg	0.37	0.35	0.38	0.41

Client Sample ID			S23-1	S23-2	S23-3	S23-4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ja04855	K22-Ja04856	K22-Ja04857	K22-Ja04858
Date Sampled			Jan 10, 2021	Jan 10, 2021	Jan 10, 2021	Jan 10, 2021
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Nickel	0.1	mg/kg	4.0	4.9	4.7	5.9
Zinc	5	mg/kg	57	85	59	82
% Moisture	1	%	35	26	26	29

Client Sample ID			S24-1	S24-2	S24-3	S24-4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ja04859	K22-Ja04860	K22-Ja04861	K22-Ja04862
Date Sampled			Jan 10, 2021	Jan 10, 2021	Jan 10, 2021	Jan 10, 2021
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	0.04	0.03	0.03	0.04
2.4'-DDT	0.01	mg/kg	0.01	0.02	0.02	0.01
4.4'-DDD	0.01	mg/kg	0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	0.04	0.03	0.03	0.03
4.4'-DDT	0.01	mg/kg	0.01	< 0.01	0.02	0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.11	0.08	0.10	0.09
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	0.04	0.02	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.06	0.02	< 0.01	0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	51	INT	51	INT
Tetrachloro-m-xylene (surr.)	1	%	133	121	126	104
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	7.9	8.0	8.7	9.1
Cadmium	0.01	mg/kg	0.78	0.99	0.43	0.81
Chromium	0.1	mg/kg	15	16	10	19
Copper	0.1	mg/kg	45	42	28	34
Lead	0.1	mg/kg	18	18	20	15
Mercury	0.01	mg/kg	0.47	0.45	0.35	0.32
Nickel	0.1	mg/kg	5.1	6.4	3.9	6.9
Zinc	5	mg/kg	51	69	52	60

Client Sample ID			S24-1	S24-2	S24-3	S24-4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ja04859	K22-Ja04860	K22-Ja04861	K22-Ja04862
Date Sampled			Jan 10, 2021	Jan 10, 2021	Jan 10, 2021	Jan 10, 2021
Test/Reference	LOR	Unit				
% Moisture	1	%	27	36	33	26

Client Sample ID			S24-2D
Sample Matrix			Soil
Eurofins Sample No.			K22-Ja04863
Date Sampled			Jan 10, 2021
Test/Reference	LOR	Unit	
Organochlorine Pesticides (NZ MfE)			
2.4'-DDD	0.01	mg/kg	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01
a-HCH	0.01	mg/kg	< 0.01
Aldrin	0.01	mg/kg	< 0.01
b-HCH	0.01	mg/kg	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01
d-HCH	0.01	mg/kg	< 0.01
Dieldrin	0.01	mg/kg	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01
Endrin	0.01	mg/kg	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01
Heptachlor	0.01	mg/kg	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01
Toxaphene	0.5	mg/kg	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01
Dibutylchlorendate (surr.)	1	%	78
Tetrachloro-m-xylene (surr.)	1	%	119
Metals M8 (NZ MfE)			
Arsenic	0.1	mg/kg	6.6
Cadmium	0.01	mg/kg	0.05
Chromium	0.1	mg/kg	16
Copper	0.1	mg/kg	14
Lead	0.1	mg/kg	15
Mercury	0.01	mg/kg	0.43
Nickel	0.1	mg/kg	6.0
Zinc	5	mg/kg	9.6
% Moisture	1	%	62

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Jan 11, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Jan 11, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Jan 11, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

eurofins | Environment Testing

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name: 21710

Order No.:
Report #: 854398
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Jan 11, 2022 12:00 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X
Christchurch Laboratory - IANZ# 1290								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	S23-1	Jan 10, 2021		Soil	K22-Ja04855	X	X	X
2	S23-2	Jan 10, 2021		Soil	K22-Ja04856	X	X	X
3	S23-3	Jan 10, 2021		Soil	K22-Ja04857	X	X	X
4	S23-4	Jan 10, 2021		Soil	K22-Ja04858	X	X	X
5	S24-1	Jan 10, 2021		Soil	K22-Ja04859	X	X	X
6	S24-2	Jan 10, 2021		Soil	K22-Ja04860	X	X	X
7	S24-3	Jan 10, 2021		Soil	K22-Ja04861	X	X	X
8	S24-4	Jan 10, 2021		Soil	K22-Ja04862	X	X	X
9	S24-2D	Jan 10, 2021		Soil	K22-Ja04863	X	X	X
Test Counts						9	9	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	94			70-130	Pass	
2.4'-DDE	%	95			70-130	Pass	
2.4'-DDT	%	77			70-130	Pass	
4.4'-DDD	%	128			70-130	Pass	
4.4'-DDE	%	91			70-130	Pass	
4.4'-DDT	%	91			70-130	Pass	
a-HCH	%	107			70-130	Pass	
Aldrin	%	106			70-130	Pass	
b-HCH	%	111			70-130	Pass	
Chlordanes - Total	%	124			70-130	Pass	
cis-Chlordane	%	124			70-130	Pass	
d-HCH	%	78			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dieldrin	%	86			70-130	Pass	
Endosulfan I	%	96			70-130	Pass	
Endosulfan II	%	100			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	100			70-130	Pass	
Endrin aldehyde	%	98			70-130	Pass	
Endrin ketone	%	123			70-130	Pass	
g-HCH (Lindane)	%	85			70-130	Pass	
Heptachlor	%	101			70-130	Pass	
Heptachlor epoxide	%	110			70-130	Pass	
Hexachlorobenzene	%	109			70-130	Pass	
Methoxychlor	%	92			70-130	Pass	
trans-Chlordane	%	115			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	100			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	93			80-120	Pass	
Copper	%	92			80-120	Pass	
Lead	%	107			80-120	Pass	
Mercury	%	106			80-120	Pass	
Nickel	%	103			80-120	Pass	
Zinc	%	114			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ja03759	NCP	%	120			70-130	Pass	
2.4'-DDE	K22-Ja03759	NCP	%	104			70-130	Pass	
2.4'-DDT	K22-Ja03759	NCP	%	87			70-130	Pass	
4.4'-DDD	K22-Ja03759	NCP	%	94			70-130	Pass	
4.4'-DDE	K22-Ja03759	NCP	%	104			70-130	Pass	
4.4'-DDT	K22-Ja07478	NCP	%	72			70-130	Pass	
a-HCH	K22-Ja03759	NCP	%	114			70-130	Pass	
Aldrin	K22-Ja03759	NCP	%	93			70-130	Pass	
b-HCH	K22-Ja03759	NCP	%	116			70-130	Pass	
Chlordanes - Total	K22-Ja03759	NCP	%	120			70-130	Pass	
cis-Chlordane	K22-Ja03759	NCP	%	116			70-130	Pass	
d-HCH	K22-Ja03759	NCP	%	90			70-130	Pass	
Dieldrin	K22-Ja03759	NCP	%	94			70-130	Pass	
Endosulfan I	K22-Ja03759	NCP	%	116			70-130	Pass	
Endosulfan II	K22-Ja03759	NCP	%	101			70-130	Pass	
Endosulfan sulphate	K22-Ja03759	NCP	%	93			70-130	Pass	
Endrin	K22-Ja03759	NCP	%	106			70-130	Pass	
Endrin aldehyde	K22-Ja03759	NCP	%	107			70-130	Pass	
Endrin ketone	K22-Ja07478	NCP	%	101			70-130	Pass	
g-HCH (Lindane)	K22-Ja03759	NCP	%	86			70-130	Pass	
Heptachlor	K22-Ja03759	NCP	%	100			70-130	Pass	
Heptachlor epoxide	K22-Ja03759	NCP	%	97			70-130	Pass	
Hexachlorobenzene	K22-Ja03759	NCP	%	116			70-130	Pass	
Methoxychlor	K22-Ja07478	NCP	%	81			70-130	Pass	
trans-Chlordane	K22-Ja03759	NCP	%	127			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ja05914	NCP	%	96			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	K22-Ja04788	NCP	%	95			75-125	Pass	
Chromium	K22-Ja05914	NCP	%	89			75-125	Pass	
Copper	K22-Ja05914	NCP	%	85			75-125	Pass	
Lead	K22-Ja04788	NCP	%	102			75-125	Pass	
Mercury	K22-Ja04788	NCP	%	101			75-125	Pass	
Nickel	K22-Ja04788	NCP	%	80			75-125	Pass	
Zinc	K22-Ja04788	NCP	%	93			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ja04855	CP	mg/kg	0.11	0.09	8.0	30%	Pass	
2.4'-DDT	K22-Ja04855	CP	mg/kg	0.02	0.02	<1	30%	Pass	
4.4'-DDD	K22-Ja04855	CP	mg/kg	0.02	0.02	16	30%	Pass	
4.4'-DDE	K22-Ja04855	CP	mg/kg	0.11	0.09	8.0	30%	Pass	
4.4'-DDT	K22-Ja04855	CP	mg/kg	0.11	0.08	32	30%	Fail	Q15
a-HCH	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ja04855	CP	mg/kg	< 0.01	0.02	120	30%	Fail	Q15
Endosulfan sulphate	K22-Ja04855	CP	mg/kg	0.03	0.03	21	30%	Pass	
Endrin	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ja04855	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ja04787	NCP	mg/kg	25	27	7.0	30%	Pass	
Cadmium	K22-Ja04787	NCP	mg/kg	0.86	0.91	5.0	30%	Pass	
Chromium	K22-Ja04787	NCP	mg/kg	42	32	25	30%	Pass	
Copper	K22-Ja04787	NCP	mg/kg	89	100	11	30%	Pass	
Lead	K22-Ja04787	NCP	mg/kg	160	140	18	30%	Pass	
Mercury	K22-Ja04787	NCP	mg/kg	0.23	0.21	9.0	30%	Pass	
Nickel	K22-Ja04787	NCP	mg/kg	27	30	12	30%	Pass	
Zinc	K22-Ja04787	NCP	mg/kg	260	310	15	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ja04855	CP	%	35	34	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Organic (NZN)
Shasti Ramachandran	Senior Analyst-Metal (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention: **Jordan Vaughn**

Report **857383-S**
Project name
Project ID 21710
Received Date Jan 21, 2022

Client Sample ID			**S43**	**S44**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**K22-Ja25423**	**K22-Ja25424**
Date Sampled			**Jan 17, 2022**	**Jan 17, 2022**
Test/Reference	LOR	Unit		
Organochlorine Pesticides (NZ MfE)				
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	0.04	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	0.03	< 0.01
4.4'-DDT	0.01	mg/kg	0.03	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.10	< 0.01
a-HCH	0.01	mg/kg	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	0.20	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	0.04	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	99	148
Tetrachloro-m-xylene (surr.)	1	%	63	120
% Moisture	1	%	29	3.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Jan 24, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
% Moisture	Auckland	Jan 24, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

eurofins | Environment Testing

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Eurofins Environment Testing Australia Pty Ltd
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NATA # 1261 Site # 1254

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NATA # 1261 Site # 18217

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
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Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 857383
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Jan 21, 2022 4:00 PM
Due: Jan 28, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Moisture Set	Organochlorine Pesticides (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X
Christchurch Laboratory - IANZ# 1290							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	S43	Jan 17, 2022		Soil	K22-Ja25423	X	X
2	S44	Jan 17, 2022		Soil	K22-Ja25424	X	X
Test Counts						2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

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ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
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CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
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RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	109			70-130	Pass	
2.4'-DDE	%	94			70-130	Pass	
2.4'-DDT	%	91			70-130	Pass	
4.4'-DDD	%	88			70-130	Pass	
4.4'-DDE	%	98			70-130	Pass	
4.4'-DDT	%	78			70-130	Pass	
a-HCH	%	74			70-130	Pass	
Aldrin	%	80			70-130	Pass	
b-HCH	%	98			70-130	Pass	
Chlordanes - Total	%	89			70-130	Pass	
cis-Chlordane	%	89			70-130	Pass	
d-HCH	%	83			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	97			70-130	Pass	
Endosulfan II	%	94			70-130	Pass	
Endosulfan sulphate	%	97			70-130	Pass	
Endrin	%	108			70-130	Pass	
Endrin aldehyde	%	84			70-130	Pass	
Endrin ketone	%	100			70-130	Pass	
g-HCH (Lindane)	%	81			70-130	Pass	
Heptachlor	%	77			70-130	Pass	
Heptachlor epoxide	%	87			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Hexachlorobenzene			%	97			70-130	Pass	
Methoxychlor			%	71			70-130	Pass	
trans-Chlordane			%	89			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
4.4'-DDD	Z22-Ja22910	NCP	%	96			70-130	Pass	
4.4'-DDT	Z22-Ja22910	NCP	%	83			70-130	Pass	
Methoxychlor	Z22-Ja22910	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ja25424	CP	%	117			70-130	Pass	
2.4'-DDE	K22-Ja25424	CP	%	110			70-130	Pass	
2.4'-DDT	K22-Ja25424	CP	%	122			70-130	Pass	
4.4'-DDE	K22-Ja25424	CP	%	113			70-130	Pass	
a-HCH	K22-Ja25424	CP	%	82			70-130	Pass	
Aldrin	K22-Ja25424	CP	%	99			70-130	Pass	
b-HCH	K22-Ja25424	CP	%	96			70-130	Pass	
Chlordanes - Total	K22-Ja25424	CP	%	106			70-130	Pass	
cis-Chlordane	K22-Ja25424	CP	%	100			70-130	Pass	
d-HCH	K22-Ja25424	CP	%	86			70-130	Pass	
Dieldrin	K22-Ja25424	CP	%	120			70-130	Pass	
Endosulfan I	K22-Ja25424	CP	%	75			70-130	Pass	
Endosulfan II	K22-Ja25424	CP	%	104			70-130	Pass	
Endosulfan sulphate	K22-Ja25424	CP	%	121			70-130	Pass	
Endrin	K22-Ja25424	CP	%	101			70-130	Pass	
Endrin aldehyde	K22-Ja25424	CP	%	81			70-130	Pass	
Endrin ketone	K22-Ja25424	CP	%	124			70-130	Pass	
g-HCH (Lindane)	K22-Ja25424	CP	%	74			70-130	Pass	
Heptachlor	K22-Ja25424	CP	%	75			70-130	Pass	
Heptachlor epoxide	K22-Ja25424	CP	%	97			70-130	Pass	
Hexachlorobenzene	K22-Ja25424	CP	%	97			70-130	Pass	
trans-Chlordane	K22-Ja25424	CP	%	113			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	Z22-Ja22908	NCP	mg/kg	0.02	0.02	23	30%	Pass	
2.4'-DDT	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	Z22-Ja22908	NCP	mg/kg	0.02	0.02	18	30%	Pass	
4.4'-DDT	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-HCH	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
Endrin aldehyde	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	Z22-Ja22908	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ja25683	NCP	%	23	23	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Organic (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Attention: **Jordan Vaughn**

Report **855913-S**
Project name
Project ID 21710
Received Date Jan 18, 2022

Client Sample ID			**COMPOSITE S21**	**COMPOSITE S22**	**S43**	**S44**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K22-Ja14094**	**K22-Ja14095**	**K22-Ja14096**	**K22-Ja14097**
Date Sampled			**Jan 17, 2022**	**Jan 17, 2022**	**Jan 17, 2022**	**Jan 17, 2022**
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	-	-
2.4'-DDE	0.01	mg/kg	0.02	0.08	-	-
2.4'-DDT	0.01	mg/kg	< 0.01	0.01	-	-
4.4'-DDD	0.01	mg/kg	< 0.01	0.01	-	-
4.4'-DDE	0.01	mg/kg	0.02	0.08	-	-
4.4'-DDT	0.01	mg/kg	< 0.01	0.07	-	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.04	0.25	-	-
a-HCH	0.01	mg/kg	< 0.01	< 0.01	-	-
Aldrin	0.01	mg/kg	< 0.01	< 0.01	-	-
b-HCH	0.01	mg/kg	< 0.01	< 0.01	-	-
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	-	-
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	-	-
d-HCH	0.01	mg/kg	< 0.01	< 0.01	-	-
Dieldrin	0.01	mg/kg	0.08	0.14	-	-
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	-	-
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	-	-
Endosulfan sulphate	0.01	mg/kg	0.02	< 0.01	-	-
Endrin	0.01	mg/kg	< 0.01	< 0.01	-	-
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	-	-
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	-	-
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	-	-
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	-	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	-	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	-	-
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	-	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	-	-
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	-	-
Dibutylchlorendate (surr.)	1	%	INT	137	-	-
Tetrachloro-m-xylene (surr.)	1	%	59	59	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	7.4	7.4	21	45
Cadmium	0.01	mg/kg	0.31	0.61	0.37	0.19
Chromium	0.1	mg/kg	11	13	23	28
Copper	0.1	mg/kg	26	49	34	82
Lead	0.1	mg/kg	16	16	36	15

Client Sample ID			COMPOSITE S21	COMPOSITE S22	S43	S44
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ja14094	K22-Ja14095	K22-Ja14096	K22-Ja14097
Date Sampled			Jan 17, 2022	Jan 17, 2022	Jan 17, 2022	Jan 17, 2022
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.44	0.44	0.37	0.08
Nickel	0.1	mg/kg	4.0	6.3	6.1	29
Zinc	5	mg/kg	25	52	440	2000
% Moisture	1	%	38	28	29	2.7
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	-	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	-	< 10	< 10
TPH-SG C15-C36	20	mg/kg	-	-	< 20	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	-	-	< 35	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	-	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	-	-	< 0.03	< 0.03
Anthracene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	-	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	-	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	-	< 0.03	< 0.03
Chrysene	0.03	mg/kg	-	-	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	-	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	-	-	< 0.03	< 0.03
Fluorene	0.03	mg/kg	-	-	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	-	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	-	-	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	-	-	< 0.03	< 0.03
Pyrene	0.03	mg/kg	-	-	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	-	-	98	101
2-Fluorobiphenyl (surr.)	1	%	-	-	87	93

Client Sample ID			S45	S21-3D
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ja14098	K22-Ja14099
Date Sampled			Jan 17, 2022	Jan 17, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides (NZ MfE)				
2.4'-DDD	0.01	mg/kg	-	< 0.01
2.4'-DDE	0.01	mg/kg	-	< 0.01
2.4'-DDT	0.01	mg/kg	-	< 0.01
4.4'-DDD	0.01	mg/kg	-	< 0.01
4.4'-DDE	0.01	mg/kg	-	< 0.01
4.4'-DDT	0.01	mg/kg	-	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	-	< 0.01
a-HCH	0.01	mg/kg	-	< 0.01

Client Sample ID			S45	S21-3D
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ja14098	K22-Ja14099
Date Sampled			Jan 17, 2022	Jan 17, 2022
Test/Reference	LOR	Unit		
Organochlorine Pesticides (NZ MfE)				
Aldrin	0.01	mg/kg	-	< 0.01
b-HCH	0.01	mg/kg	-	< 0.01
Chlordanes - Total	0.01	mg/kg	-	< 0.01
cis-Chlordane	0.01	mg/kg	-	< 0.01
d-HCH	0.01	mg/kg	-	< 0.01
Dieldrin	0.01	mg/kg	-	< 0.01
Endosulfan I	0.01	mg/kg	-	< 0.01
Endosulfan II	0.01	mg/kg	-	< 0.01
Endosulfan sulphate	0.01	mg/kg	-	< 0.01
Endrin	0.01	mg/kg	-	< 0.01
Endrin aldehyde	0.01	mg/kg	-	< 0.01
Endrin ketone	0.01	mg/kg	-	< 0.01
g-HCH (Lindane)	0.01	mg/kg	-	< 0.01
Heptachlor	0.01	mg/kg	-	< 0.01
Heptachlor epoxide	0.01	mg/kg	-	< 0.01
Hexachlorobenzene	0.01	mg/kg	-	< 0.01
Methoxychlor	0.01	mg/kg	-	< 0.01
Toxaphene	0.5	mg/kg	-	< 0.5
trans-Chlordane	0.01	mg/kg	-	< 0.01
Dibutylchlorendate (surr.)	1	%	-	125
Tetrachloro-m-xylene (surr.)	1	%	-	61
Metals M8 (NZ MfE)				
Arsenic	0.1	mg/kg	6.2	6.4
Cadmium	0.01	mg/kg	0.76	0.04
Chromium	0.1	mg/kg	12	11
Copper	0.1	mg/kg	50	13
Lead	0.1	mg/kg	17	14
Mercury	0.01	mg/kg	0.38	0.37
Nickel	0.1	mg/kg	12	5.9
Zinc	5	mg/kg	57	9.3
% Moisture	1	%	21	62
Total Petroleum Hydrocarbons (NZ MfE 1999)				
TPH-SG C7-C9	5	mg/kg	< 5	-
TPH-SG C10-C14	10	mg/kg	< 10	-
TPH-SG C15-C36	20	mg/kg	< 20	-
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)				
Acenaphthene	0.03	mg/kg	< 0.03	-
Acenaphthylene	0.03	mg/kg	< 0.03	-
Anthracene	0.03	mg/kg	< 0.03	-
Benz(a)anthracene	0.03	mg/kg	< 0.03	-
Benzo(a)pyrene	0.03	mg/kg	< 0.03	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	-
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	-
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	-

Client Sample ID			S45	S21-3D
Sample Matrix			Soil	Soil
Eurofins Sample No.			K22-Ja14098	K22-Ja14099
Date Sampled			Jan 17, 2022	Jan 17, 2022
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons (NZ MfE)				
Chrysene	0.03	mg/kg	< 0.03	-
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	-
Fluoranthene	0.03	mg/kg	< 0.03	-
Fluorene	0.03	mg/kg	< 0.03	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	-
Naphthalene	0.1	mg/kg	< 0.1	-
Phenanthrene	0.03	mg/kg	< 0.03	-
Pyrene	0.03	mg/kg	< 0.03	-
p-Terphenyl-d14 (surr.)	1	%	112	-
2-Fluorobiphenyl (surr.)	1	%	93	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Jan 18, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Jan 18, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Jan 18, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Jan 18, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Jan 18, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			

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Company Name: Soil & Rock Consultants
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Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 855913
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Jan 18, 2022 7:30 AM
Due: Jan 19, 2022
Priority: 1 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMPOSITE S21	Jan 17, 2022		Soil	K22-Ja14094		X	X	X		
2	COMPOSITE S22	Jan 17, 2022		Soil	K22-Ja14095		X	X	X		
3	S43	Jan 17, 2022		Soil	K22-Ja14096		X			X	X
4	S44	Jan 17, 2022		Soil	K22-Ja14097		X			X	X
5	S45	Jan 17, 2022		Soil	K22-Ja14098		X			X	X
6	S21-3D	Jan 17, 2022		Soil	K22-Ja14099		X	X	X		
7	S21-1	Jan 17, 2022		Soil	K22-Ja14100	X					
8	S21-2	Jan 17, 2022		Soil	K22-Ja14101	X					
9	S21-3	Jan 17, 2022		Soil	K22-Ja14102	X					
10	S21-4	Jan 17, 2022		Soil	K22-Ja14103	X					
11	S22-1	Jan 17, 2022		Soil	K22-Ja14104	X					

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Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
12	S22-2	Jan 17, 2022		Soil	K22-Ja14105	X					
13	S22-3	Jan 17, 2022		Soil	K22-Ja14106	X					
14	S22-4	Jan 17, 2022		Soil	K22-Ja14107	X					
Test Counts						8	6	3	3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	94			70-130	Pass	
2.4'-DDE	%	95			70-130	Pass	
2.4'-DDT	%	78			70-130	Pass	
4.4'-DDD	%	106			70-130	Pass	
4.4'-DDE	%	90			70-130	Pass	
4.4'-DDT	%	80			70-130	Pass	
a-HCH	%	111			70-130	Pass	
Aldrin	%	93			70-130	Pass	
b-HCH	%	101			70-130	Pass	
Chlordanes - Total	%	123			70-130	Pass	
cis-Chlordane	%	124			70-130	Pass	
d-HCH	%	83			70-130	Pass	
Dieldrin	%	85			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	89			70-130	Pass	
Endosulfan sulphate	%	99			70-130	Pass	
Endrin	%	95			70-130	Pass	
Endrin aldehyde	%	94			70-130	Pass	
Endrin ketone	%	116			70-130	Pass	
g-HCH (Lindane)	%	89			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	109			70-130	Pass	
Hexachlorobenzene	%	113			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
trans-Chlordane	%	106			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	93			80-120	Pass	
Cadmium	%	93			80-120	Pass	
Chromium	%	86			80-120	Pass	
Copper	%	86			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	97			80-120	Pass	
Nickel	%	96			80-120	Pass	
Zinc	%	103			80-120	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	%	77			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	129			70-130	Pass	
Acenaphthylene	%	123			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	%	96			70-130	Pass	
Benzo(g.h.i)perylene	%	128			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	121			70-130	Pass	
Dibenz(a.h)anthracene	%	77			70-130	Pass	
Fluoranthene	%	99			70-130	Pass	
Fluorene	%	122			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	81			70-130	Pass	
Naphthalene	%	124			70-130	Pass	
Phenanthrene	%	105			70-130	Pass	
Pyrene	%	100			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ja03749	NCP	%	106			70-130	Pass	
2.4'-DDE	K22-Ja03749	NCP	%	96			70-130	Pass	
2.4'-DDT	K22-Ja03749	NCP	%	83			70-130	Pass	
4.4'-DDD	K22-Ja03749	NCP	%	104			70-130	Pass	
4.4'-DDE	K22-Ja03749	NCP	%	90			70-130	Pass	
4.4'-DDT	K22-Ja03749	NCP	%	72			70-130	Pass	
a-HCH	K22-Ja03749	NCP	%	95			70-130	Pass	
Aldrin	K22-Ja03749	NCP	%	81			70-130	Pass	
b-HCH	K22-Ja03749	NCP	%	99			70-130	Pass	
Chlordanes - Total	K22-Ja03749	NCP	%	113			70-130	Pass	
cis-Chlordane	K22-Ja03749	NCP	%	112			70-130	Pass	
d-HCH	K22-Ja03749	NCP	%	78			70-130	Pass	
Dieldrin	K22-Ja03749	NCP	%	98			70-130	Pass	
Endosulfan I	K22-Ja03749	NCP	%	95			70-130	Pass	
Endosulfan II	K22-Ja03749	NCP	%	84			70-130	Pass	
Endosulfan sulphate	K22-Ja03749	NCP	%	98			70-130	Pass	
Endrin	K22-Ja03749	NCP	%	87			70-130	Pass	
Endrin aldehyde	K22-Ja03749	NCP	%	99			70-130	Pass	
Endrin ketone	K22-Ja03749	NCP	%	117			70-130	Pass	
g-HCH (Lindane)	K22-Ja03749	NCP	%	75			70-130	Pass	
Heptachlor	K22-Ja03749	NCP	%	99			70-130	Pass	
Heptachlor epoxide	K22-Ja03749	NCP	%	119			70-130	Pass	
Hexachlorobenzene	K22-Ja03749	NCP	%	100			70-130	Pass	
Methoxychlor	K22-Ja03749	NCP	%	78			70-130	Pass	
trans-Chlordane	K22-Ja03749	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Copper	K22-Ja09774	NCP	%	80			75-125	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ja14095	CP	%	86			75-125	Pass	
Cadmium	K22-Ja14095	CP	%	87			75-125	Pass	
Chromium	K22-Ja14095	CP	%	81			75-125	Pass	
Lead	K22-Ja14095	CP	%	99			75-125	Pass	
Mercury	K22-Ja14095	CP	%	96			75-125	Pass	
Nickel	K22-Ja14095	CP	%	91			75-125	Pass	
Zinc	K22-Ja14095	CP	%	97			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C9	K22-Ja09280	NCP	%	113			70-130	Pass	
TPH-SG C7-C36 (Total)	K22-Ja03749	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Ja03759	NCP	%	134			70-130	Fail	Q08
Acenaphthylene	K22-Ja03749	NCP	%	127			70-130	Pass	
Anthracene	K22-Ja03749	NCP	%	108			70-130	Pass	
Benz(a)anthracene	K22-Ja03749	NCP	%	95			70-130	Pass	
Benzo(a)pyrene	K22-Ja03739	NCP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Ja03749	NCP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	K22-Ja03739	NCP	%	121			70-130	Pass	
Benzo(k)fluoranthene	K22-Ja03749	NCP	%	85			70-130	Pass	
Chrysene	K22-Ja03749	NCP	%	112			70-130	Pass	
Dibenz(a.h)anthracene	K22-Ja03548	NCP	%	83			70-130	Pass	
Fluoranthene	K22-Ja03749	NCP	%	107			70-130	Pass	
Fluorene	K22-Ja03749	NCP	%	126			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ja03739	NCP	%	72			70-130	Pass	
Naphthalene	K22-Ja03749	NCP	%	123			70-130	Pass	
Phenanthrene	K22-Ja03749	NCP	%	105			70-130	Pass	
Pyrene	K22-Ja03749	NCP	%	107			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ja14094	CP	mg/kg	0.02	< 0.01	95	30%	Fail	Q15
2.4'-DDT	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K22-Ja14094	CP	mg/kg	0.02	< 0.01	70	30%	Fail	Q15
4.4'-DDT	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-HCH	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ja14094	CP	mg/kg	0.08	0.02	150	30%	Fail	Q15
Endosulfan I	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ja14094	CP	mg/kg	0.02	0.02	13	30%	Pass	
Endrin	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ja14094	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ja14094	CP	mg/kg	7.4	7.0	5.0	30%	Pass	
Cadmium	K22-Ja14094	CP	mg/kg	0.31	0.32	2.0	30%	Pass	
Chromium	K22-Ja14094	CP	mg/kg	11	11	<1	30%	Pass	
Copper	K22-Ja14094	CP	mg/kg	26	28	9.0	30%	Pass	
Lead	K22-Ja14094	CP	mg/kg	16	15	6.0	30%	Pass	
Mercury	K22-Ja14094	CP	mg/kg	0.44	0.47	8.0	30%	Pass	
Nickel	K22-Ja14094	CP	mg/kg	4.0	4.0	2.0	30%	Pass	
Zinc	K22-Ja14094	CP	mg/kg	25	23	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ja14094	CP	%	38	37	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Ja14094	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ja14094	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Ja09279	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Ja09279	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Ja09279	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Ja09279	NCP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Ja03748	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ja03748	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Karishma Patel	Analytical Services Manager
Michael Ritchie	Senior Analyst-Organic (NZN)
Shasti Ramachandran	Senior Analyst-Metal (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention: **Jordan Vaughn**

Report **867278-S**
Project name
Project ID 21710
Received Date Mar 01, 2022

Client Sample ID			CS01	CS02	CS03	CS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00480	K22-Ma00481	K22-Ma00482	K22-Ma00483
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	65	60	83	65
Tetrachloro-m-xylene (surr.)	1	%	84	85	99	81
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	4.0	2.1	2.5	2.3
Cadmium	0.01	mg/kg	0.10	0.14	0.20	0.19
Chromium	0.1	mg/kg	19	8.7	8.9	8.5
Copper	0.1	mg/kg	24	7.0	9.6	9.3
Lead	0.1	mg/kg	20	6.6	15	14

Client Sample ID			CS01	CS02	CS03	CS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00480	K22-Ma00481	K22-Ma00482	K22-Ma00483
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.11	0.06	0.09	0.08
Nickel	0.1	mg/kg	21	2.4	3.7	3.6
Zinc	5	mg/kg	75	19	36	33
% Moisture	1	%	16	17	21	21

Client Sample ID			CS05	CS13	CS14	CS101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00484	K22-Ma00485	K22-Ma00486	K22-Ma00487
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	0.05	0.02
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	0.02	0.18	0.08
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	0.05	0.13
4.4'-DDE	0.01	mg/kg	< 0.01	0.06	0.34	0.35
4.4'-DDT	0.01	mg/kg	< 0.01	0.04	0.11	0.48
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	0.12	0.73	1.1
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	0.05	0.31	0.33
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	0.03	0.05
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	63	105	72	88
Tetrachloro-m-xylene (surr.)	1	%	77	116	95	100
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	6.0	5.5	3.6	3.6
Cadmium	0.01	mg/kg	0.10	0.21	0.53	0.54
Chromium	0.1	mg/kg	5.3	12	14	11
Copper	0.1	mg/kg	5.5	38	32	33
Lead	0.1	mg/kg	5.0	12	13	13
Mercury	0.01	mg/kg	0.09	0.19	0.39	0.44

Client Sample ID			CS05	CS13	CS14	CS101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00484	K22-Ma00485	K22-Ma00486	K22-Ma00487
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Nickel	0.1	mg/kg	1.9	9.1	5.2	5.3
Zinc	5	mg/kg	10.0	61	17	17
% Moisture	1	%	5.4	16	39	37

Client Sample ID			CS15	CS16	CS18	S01-2D
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00488	K22-Ma00489	K22-Ma00490	K22-Ma00491
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.02	0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	0.02	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.13	0.06	0.01	< 0.01
4.4'-DDD	0.01	mg/kg	0.21	0.07	0.02	< 0.01
4.4'-DDE	0.01	mg/kg	0.58	0.17	0.12	< 0.01
4.4'-DDT	0.01	mg/kg	0.70	0.33	0.22	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	1.7	0.64	0.37	< 0.01
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	0.87	0.62	0.02	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	0.03	0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.08	0.04	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	88	91	82	73
Tetrachloro-m-xylene (surr.)	1	%	92	117	108	90
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	3.6	5.0	2.8	1.5
Cadmium	0.01	mg/kg	0.66	0.61	0.27	< 0.01
Chromium	0.1	mg/kg	11	11	6.5	9.0
Copper	0.1	mg/kg	39	33	20	3.4
Lead	0.1	mg/kg	14	12	9.8	5.4
Mercury	0.01	mg/kg	0.42	0.35	0.20	0.16
Nickel	0.1	mg/kg	5.3	6.9	3.1	3.6
Zinc	5	mg/kg	25	27	16	< 5

Client Sample ID			CS15	CS16	CS18	S01-2D
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00488	K22-Ma00489	K22-Ma00490	K22-Ma00491
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	33	19	17	15

Client Sample ID			S03-2D	S27	S28	S48
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00492	K22-Ma00493	K22-Ma00494	K22-Ma00495
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Dieldrin	0.01	mg/kg	< 0.01	0.03	< 0.01	-
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	-
Dibutylchlorendate (surr.)	1	%	71	96	102	-
Tetrachloro-m-xylene (surr.)	1	%	105	104	64	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	0.8	7.4	2.1	9.4
Cadmium	0.01	mg/kg	< 0.01	0.24	0.07	0.08
Chromium	0.1	mg/kg	8.6	13	8.7	25
Copper	0.1	mg/kg	3.2	23	3.1	34
Lead	0.1	mg/kg	4.1	12	9.6	8.2
Mercury	0.01	mg/kg	0.07	0.09	0.10	0.05
Nickel	0.1	mg/kg	2.5	14	2.0	52
Zinc	5	mg/kg	8.1	110	18	160
% Moisture	1	%	20	24	19	15

Client Sample ID			S03-2D	S27	S28	S48
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00492	K22-Ma00493	K22-Ma00494	K22-Ma00495
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	< 5	< 5	-
TPH-SG C10-C14	10	mg/kg	-	< 10	< 10	-
TPH-SG C15-C36	20	mg/kg	-	< 20	< 20	-
TPH-SG C7-C36 (Total)	35	mg/kg	-	< 35	< 35	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	< 0.03	< 0.03	-
Acenaphthylene	0.03	mg/kg	-	< 0.03	< 0.03	-
Anthracene	0.03	mg/kg	-	< 0.03	< 0.03	-
Benz(a)anthracene	0.03	mg/kg	-	0.05	< 0.03	-
Benzo(a)pyrene	0.03	mg/kg	-	0.09	< 0.03	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	0.12	< 0.03	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	0.13	0.04	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	0.15	0.08	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	0.05	< 0.03	-
Benzo(g.h.i)perylene	0.03	mg/kg	-	0.04	< 0.03	-
Benzo(k)fluoranthene	0.03	mg/kg	-	0.09	< 0.03	-
Chrysene	0.03	mg/kg	-	0.07	< 0.03	-
Dibenz(a.h)anthracene	0.03	mg/kg	-	< 0.03	< 0.03	-
Fluoranthene	0.03	mg/kg	-	0.18	< 0.03	-
Fluorene	0.03	mg/kg	-	< 0.03	< 0.03	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	0.05	< 0.03	-
Naphthalene	0.1	mg/kg	-	< 0.1	< 0.1	-
Phenanthrene	0.03	mg/kg	-	0.04	< 0.03	-
Pyrene	0.03	mg/kg	-	0.24	< 0.03	-
p-Terphenyl-d14 (surr.)	1	%	-	54	63	-
2-Fluorobiphenyl (surr.)	1	%	-	72	54	-

Client Sample ID			S49	S04-2D	S29	S13-4D
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00496	K22-Ma00498	K22-Ma00499	K22-Ma00500
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
4.4'-DDD	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
4.4'-DDE	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
4.4'-DDT	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
a-HCH	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01

Client Sample ID			S49	S04-2D	S29	S13-4D
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00496	K22-Ma00498	K22-Ma00499	K22-Ma00500
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Endosulfan II	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	-	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	-	112	131	106
Tetrachloro-m-xylene (surr.)	1	%	-	73	74	65
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	2.4	1.2	1.9	12
Cadmium	0.01	mg/kg	0.12	< 0.01	0.05	0.03
Chromium	0.1	mg/kg	8.8	11	4.5	15
Copper	0.1	mg/kg	15	2.4	4.3	15
Lead	0.1	mg/kg	14	3.3	5.8	15
Mercury	0.01	mg/kg	0.10	0.04	0.09	0.48
Nickel	0.1	mg/kg	4.9	1.6	0.9	11
Zinc	5	mg/kg	75	5.3	25	10
% Moisture	1	%	21	22	11	56
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	-	< 5	-
TPH-SG C10-C14	10	mg/kg	-	-	< 10	-
TPH-SG C15-C36	20	mg/kg	-	-	< 20	-
TPH-SG C7-C36 (Total)	35	mg/kg	-	-	< 35	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	-	< 0.03	-
Acenaphthylene	0.03	mg/kg	-	-	< 0.03	-
Anthracene	0.03	mg/kg	-	-	< 0.03	-
Benz(a)anthracene	0.03	mg/kg	-	-	< 0.03	-
Benzo(a)pyrene	0.03	mg/kg	-	-	< 0.03	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	-	< 0.03	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	-	0.04	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	-	0.08	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	-	< 0.03	-
Benzo(g.h.i)perylene	0.03	mg/kg	-	-	< 0.03	-
Benzo(k)fluoranthene	0.03	mg/kg	-	-	< 0.03	-
Chrysene	0.03	mg/kg	-	-	< 0.03	-
Dibenz(a.h)anthracene	0.03	mg/kg	-	-	< 0.03	-
Fluoranthene	0.03	mg/kg	-	-	< 0.03	-
Fluorene	0.03	mg/kg	-	-	< 0.03	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	-	< 0.03	-
Naphthalene	0.1	mg/kg	-	-	< 0.1	-
Phenanthrene	0.03	mg/kg	-	-	< 0.03	-

Client Sample ID			S49	S04-2D	S29	S13-4D
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00496	K22-Ma00498	K22-Ma00499	K22-Ma00500
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Pyrene	0.03	mg/kg	-	-	< 0.03	-
p-Terphenyl-d14 (surr.)	1	%	-	-	73	-
2-Fluorobiphenyl (surr.)	1	%	-	-	73	-

Client Sample ID			S15-4D	S18-2D	S36	S37
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00501	K22-Ma00502	K22-Ma00503	K22-Ma00504
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	0.01	< 0.01
4.4'-DDD	0.01	mg/kg	< 0.01	< 0.01	0.01	< 0.01
4.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	0.04	< 0.01
4.4'-DDT	0.01	mg/kg	< 0.01	< 0.01	0.06	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	< 0.01	0.12	< 0.01
a-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-HCH	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	0.09	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-HCH (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	116	118	INT	115
Tetrachloro-m-xylene (surr.)	1	%	74	76	72	66
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	5.4	0.4	30	4.2
Cadmium	0.01	mg/kg	0.02	0.02	1.0	0.12
Chromium	0.1	mg/kg	11	2.2	24	15
Copper	0.1	mg/kg	11	1.6	91	62
Lead	0.1	mg/kg	13	3.1	49	14
Mercury	0.01	mg/kg	0.25	0.08	0.66	0.06
Nickel	0.1	mg/kg	4.9	0.6	14	10.0
Zinc	5	mg/kg	5.4	< 5	260	150

Client Sample ID			S15-4D	S18-2D	S36	S37
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00501	K22-Ma00502	K22-Ma00503	K22-Ma00504
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	62	12	22	7.4
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	-	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	-	< 10	< 10
TPH-SG C15-C36	20	mg/kg	-	-	38	< 20
TPH-SG C7-C36 (Total)	35	mg/kg	-	-	38	< 35
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	-	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	-	-	< 0.03	< 0.03
Anthracene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	-	0.05	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	-	0.05	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	-	0.08	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	-	0.09	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	-	0.11	0.07
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	-	0.09	0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	-	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	-	0.09	0.04
Chrysene	0.03	mg/kg	-	-	0.05	0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	-	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	-	-	0.08	0.05
Fluorene	0.03	mg/kg	-	-	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	-	0.04	< 0.03
Naphthalene	0.1	mg/kg	-	-	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	-	-	< 0.03	< 0.03
Pyrene	0.03	mg/kg	-	-	0.08	0.05
p-Terphenyl-d14 (surr.)	1	%	-	-	59	66
2-Fluorobiphenyl (surr.)	1	%	-	-	70	64

Client Sample ID			S41	S58	S59	S60
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00505	K22-Ma00506	K22-Ma00507	K22-Ma00508
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Comments			G01			
2.4'-DDD	0.01	mg/kg	< 0.1	-	-	-
2.4'-DDE	0.01	mg/kg	< 0.1	-	-	-
2.4'-DDT	0.01	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.01	mg/kg	< 0.1	-	-	-
4.4'-DDE	0.01	mg/kg	0.28	-	-	-
4.4'-DDT	0.01	mg/kg	< 0.1	-	-	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.3	-	-	-
a-HCH	0.01	mg/kg	< 0.1	-	-	-
Aldrin	0.01	mg/kg	< 0.1	-	-	-
b-HCH	0.01	mg/kg	< 0.1	-	-	-
Chlordanes - Total	0.01	mg/kg	< 0.2	-	-	-
cis-Chlordane	0.01	mg/kg	< 0.1	-	-	-

Client Sample ID			S41	S58	S59	S60
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00505	K22-Ma00506	K22-Ma00507	K22-Ma00508
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
d-HCH	0.01	mg/kg	< 0.1	-	-	-
Dieldrin	0.01	mg/kg	0.21	-	-	-
Endosulfan I	0.01	mg/kg	< 0.1	-	-	-
Endosulfan II	0.01	mg/kg	< 0.1	-	-	-
Endosulfan sulphate	0.01	mg/kg	< 0.1	-	-	-
Endrin	0.01	mg/kg	< 0.1	-	-	-
Endrin aldehyde	0.01	mg/kg	< 0.1	-	-	-
Endrin ketone	0.01	mg/kg	< 0.1	-	-	-
g-HCH (Lindane)	0.01	mg/kg	< 0.1	-	-	-
Heptachlor	0.01	mg/kg	< 0.1	-	-	-
Heptachlor epoxide	0.01	mg/kg	< 0.1	-	-	-
Hexachlorobenzene	0.01	mg/kg	< 0.1	-	-	-
Methoxychlor	0.01	mg/kg	< 0.1	-	-	-
Toxaphene	0.5	mg/kg	< 0.5	-	-	-
trans-Chlordane	0.01	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	150	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	66	-	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	10	31	8.0	8.5
Cadmium	0.01	mg/kg	0.31	0.62	0.13	0.77
Chromium	0.1	mg/kg	20	26	11	12
Copper	0.1	mg/kg	79	88	25	76
Lead	0.1	mg/kg	230	160	61	72
Mercury	0.01	mg/kg	0.29	0.22	0.21	0.37
Nickel	0.1	mg/kg	11	11	5.7	8.9
Zinc	5	mg/kg	150	240	180	540
% Moisture	1	%	18	14	20	29
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	-	-	-
TPH-SG C10-C14	10	mg/kg	< 10	-	-	-
TPH-SG C15-C36	20	mg/kg	36	-	-	-
TPH-SG C7-C36 (Total)	35	mg/kg	36	-	-	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Comments			G01			
Acenaphthene	0.03	mg/kg	< 0.3	-	-	-
Acenaphthylene	0.03	mg/kg	< 0.3	-	-	-
Anthracene	0.03	mg/kg	< 0.3	-	-	-
Benz(a)anthracene	0.03	mg/kg	< 0.3	-	-	-
Benzo(a)pyrene	0.03	mg/kg	< 0.3	-	-	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.3	-	-	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.4	-	-	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.8	-	-	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.3	-	-	-
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.3	-	-	-
Benzo(k)fluoranthene	0.03	mg/kg	< 0.3	-	-	-
Chrysene	0.03	mg/kg	< 0.3	-	-	-
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.3	-	-	-
Fluoranthene	0.03	mg/kg	< 0.3	-	-	-

Client Sample ID			S41	S58	S59	S60
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K22-Ma00505	K22-Ma00506	K22-Ma00507	K22-Ma00508
Date Sampled			Feb 28, 2022	Feb 28, 2022	Feb 28, 2022	Feb 28, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Fluorene	0.03	mg/kg	< 0.3	-	-	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.3	-	-	-
Naphthalene	0.1	mg/kg	< 0.3	-	-	-
Phenanthrene	0.03	mg/kg	< 0.3	-	-	-
Pyrene	0.03	mg/kg	< 0.3	-	-	-
p-Terphenyl-d14 (surr.)	1	%	71	-	-	-
2-Fluorobiphenyl (surr.)	1	%	55	-	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides (NZ MfE)	Auckland	Mar 01, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Mar 03, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Auckland	Mar 01, 2022	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Mar 03, 2022	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Mar 03, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			

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Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	CS01	Feb 28, 2022		Soil	K22-Ma00480			X	X	X		
2	CS02	Feb 28, 2022		Soil	K22-Ma00481			X	X	X		
3	CS03	Feb 28, 2022		Soil	K22-Ma00482			X	X	X		
4	CS04	Feb 28, 2022		Soil	K22-Ma00483			X	X	X		
5	CS05	Feb 28, 2022		Soil	K22-Ma00484			X	X	X		
6	CS13	Feb 28, 2022		Soil	K22-Ma00485			X	X	X		
7	CS14	Feb 28, 2022		Soil	K22-Ma00486			X	X	X		
8	CS101	Feb 28, 2022		Soil	K22-Ma00487			X	X	X		
9	CS15	Feb 28, 2022		Soil	K22-Ma00488			X	X	X		
10	CS16	Feb 28, 2022		Soil	K22-Ma00489			X	X	X		
11	CS18	Feb 28, 2022		Soil	K22-Ma00490			X	X	X		
12	S01-2D	Feb 28, 2022		Soil	K22-Ma00491			X	X	X		

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Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
13	S03-2D	Feb 28, 2022		Soil	K22-Ma00492			X	X	X		
14	S27	Feb 28, 2022		Soil	K22-Ma00493			X	X		X	X
15	S28	Feb 28, 2022		Soil	K22-Ma00494			X	X		X	X
16	S48	Feb 28, 2022		Soil	K22-Ma00495			X				X
17	S49	Feb 28, 2022		Soil	K22-Ma00496			X				X
18	ASB-2	Feb 28, 2022		Building Materials	K22-Ma00497	X						
19	S04-2D	Feb 28, 2022		Soil	K22-Ma00498			X	X	X		
20	S29	Feb 28, 2022		Soil	K22-Ma00499			X	X		X	X
21	S13-4D	Feb 28, 2022		Soil	K22-Ma00500			X	X	X		
22	S15-4D	Feb 28, 2022		Soil	K22-Ma00501			X	X	X		
23	S18-2D	Feb 28, 2022		Soil	K22-Ma00502			X	X	X		
24	S36	Feb 28, 2022		Soil	K22-Ma00503			X	X		X	X
25	S37	Feb 28, 2022		Soil	K22-Ma00504			X	X		X	X

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Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
26	S41	Feb 28, 2022		Soil	K22-Ma00505			X	X		X	X
27	S58	Feb 28, 2022		Soil	K22-Ma00506			X				X
28	S59	Feb 28, 2022		Soil	K22-Ma00507			X				X
29	S60	Feb 28, 2022		Soil	K22-Ma00508			X				X
30	ASB-1	Feb 28, 2022		Building Materials	K22-Ma00509	X						
31	S01-1	Feb 28, 2022		Soil	K22-Ma00510		X					
32	S01-2	Feb 28, 2022		Soil	K22-Ma00511		X					
33	S01-3	Feb 28, 2022		Soil	K22-Ma00512		X					
34	S01-4	Feb 28, 2022		Soil	K22-Ma00513		X					
35	S02-1	Feb 28, 2022		Soil	K22-Ma00514		X					
36	S02-2	Feb 28, 2022		Soil	K22-Ma00515		X					
37	S02-3	Feb 28, 2022		Soil	K22-Ma00516		X					
38	S02-4	Feb 28, 2022		Soil	K22-Ma00517		X					

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Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
39	S03-1	Feb 28, 2022		Soil	K22-Ma00518		X					
40	S03-2	Feb 28, 2022		Soil	K22-Ma00519		X					
41	S03-3	Feb 28, 2022		Soil	K22-Ma00520		X					
42	S03-4	Feb 28, 2022		Soil	K22-Ma00521		X					
43	S04-1	Feb 28, 2022		Soil	K22-Ma00522		X					
44	S04-2	Feb 28, 2022		Soil	K22-Ma00523		X					
45	S04-3	Feb 28, 2022		Soil	K22-Ma00524		X					
46	S04-4	Feb 28, 2022		Soil	K22-Ma00525		X					
47	S05-1	Feb 28, 2022		Soil	K22-Ma00526		X					
48	S05-2	Feb 28, 2022		Soil	K22-Ma00527		X					
49	S05-3	Feb 28, 2022		Soil	K22-Ma00528		X					
50	S05-4	Feb 28, 2022		Soil	K22-Ma00529		X					
51	S13-1	Feb 28, 2022		Soil	K22-Ma00530		X					
52	S13-2	Feb 28, 2022		Soil	K22-Ma00531		X					

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Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
53	S13-3	Feb 28, 2022		Soil	K22-Ma00532		X					
54	S13-4	Feb 28, 2022		Soil	K22-Ma00533		X					
55	S14-1	Feb 28, 2022		Soil	K22-Ma00534		X					
56	S14-2	Feb 28, 2022		Soil	K22-Ma00535		X					
57	S14-3	Feb 28, 2022		Soil	K22-Ma00536		X					
58	S14-4	Feb 28, 2022		Soil	K22-Ma00537		X					
59	S101-1	Feb 28, 2022		Soil	K22-Ma00538		X					
60	S101-2	Feb 28, 2022		Soil	K22-Ma00539		X					
61	S101-3	Feb 28, 2022		Soil	K22-Ma00540		X					
62	S101-4	Feb 28, 2022		Soil	K22-Ma00541		X					
63	S15-1	Feb 28, 2022		Soil	K22-Ma00542		X					
64	S15-2	Feb 28, 2022		Soil	K22-Ma00543		X					
65	S15-3	Feb 28, 2022		Soil	K22-Ma00544		X					
66	S15-4	Feb 28, 2022		Soil	K22-Ma00545		X					

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Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290												
External Laboratory												
67	S16-1	Feb 28, 2022		Soil	K22-Ma00546		X					
68	S16-2	Feb 28, 2022		Soil	K22-Ma00547		X					
69	S16-3	Feb 28, 2022		Soil	K22-Ma00548		X					
70	S16-4	Feb 28, 2022		Soil	K22-Ma00549		X					
71	S18-1	Feb 28, 2022		Soil	K22-Ma00550		X					
72	S18-2	Feb 28, 2022		Soil	K22-Ma00551		X					
73	S18-3	Feb 28, 2022		Soil	K22-Ma00552		X					
74	S18-4	Feb 28, 2022		Soil	K22-Ma00553		X					
Test Counts						2	44	28	23	17	6	11

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-HCH	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-HCH	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-HCH	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-HCH (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	83			70-130	Pass	
2.4'-DDE	%	79			70-130	Pass	
2.4'-DDT	%	78			70-130	Pass	
4.4'-DDD	%	108			70-130	Pass	
4.4'-DDE	%	81			70-130	Pass	
4.4'-DDT	%	71			70-130	Pass	
a-HCH	%	71			70-130	Pass	
Aldrin	%	77			70-130	Pass	
b-HCH	%	71			70-130	Pass	
Chlordanes - Total	%	88			70-130	Pass	
cis-Chlordane	%	82			70-130	Pass	
d-HCH	%	71			70-130	Pass	
Dieldrin	%	78			70-130	Pass	
Endosulfan I	%	71			70-130	Pass	
Endosulfan II	%	72			70-130	Pass	
Endosulfan sulphate	%	79			70-130	Pass	
Endrin	%	78			70-130	Pass	
Endrin aldehyde	%	94			70-130	Pass	
Endrin ketone	%	89			70-130	Pass	
g-HCH (Lindane)	%	80			70-130	Pass	
Heptachlor	%	81			70-130	Pass	
Heptachlor epoxide	%	87			70-130	Pass	
Hexachlorobenzene	%	89			70-130	Pass	
Methoxychlor	%	71			70-130	Pass	
trans-Chlordane	%	93			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	87			80-120	Pass	
Cadmium	%	83			80-120	Pass	
Chromium	%	88			80-120	Pass	
Copper	%	87			80-120	Pass	
Lead	%	83			80-120	Pass	
Mercury	%	100			80-120	Pass	
Nickel	%	86			80-120	Pass	
Zinc	%	89			80-120	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C36 (Total)	%	123			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	74			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene			%	78			70-130	Pass	
Benz(a)anthracene			%	74			70-130	Pass	
Benzo(a)pyrene			%	74			70-130	Pass	
Benzo(b&j)fluoranthene			%	73			70-130	Pass	
Benzo(g.h.i)perylene			%	83			70-130	Pass	
Benzo(k)fluoranthene			%	105			70-130	Pass	
Chrysene			%	103			70-130	Pass	
Dibenz(a.h)anthracene			%	87			70-130	Pass	
Fluoranthene			%	81			70-130	Pass	
Fluorene			%	75			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	80			70-130	Pass	
Naphthalene			%	84			70-130	Pass	
Phenanthrene			%	75			70-130	Pass	
Pyrene			%	73			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Lead	K22-Ma03153	NCP	%	80			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDE	K22-Ma00481	CP	%	114			70-130	Pass	
4.4'-DDD	K22-Ma00481	CP	%	108			70-130	Pass	
4.4'-DDE	K22-Ma00481	CP	%	128			70-130	Pass	
4.4'-DDT	K22-Ma00481	CP	%	103			70-130	Pass	
a-HCH	K22-Ma00481	CP	%	112			70-130	Pass	
Aldrin	K22-Ma00481	CP	%	105			70-130	Pass	
b-HCH	K22-Ma00481	CP	%	117			70-130	Pass	
Chlordanes - Total	K22-Ma00481	CP	%	115			70-130	Pass	
cis-Chlordane	K22-Ma00481	CP	%	122			70-130	Pass	
d-HCH	K22-Ma00481	CP	%	108			70-130	Pass	
Dieldrin	K22-Ma00481	CP	%	121			70-130	Pass	
Endosulfan I	K22-Ma00481	CP	%	119			70-130	Pass	
Endosulfan II	K22-Ma00481	CP	%	129			70-130	Pass	
Endosulfan sulphate	K22-Ma00481	CP	%	122			70-130	Pass	
Endrin	K22-Ma00481	CP	%	97			70-130	Pass	
Endrin aldehyde	K22-Ma00481	CP	%	72			70-130	Pass	
Endrin ketone	K22-Ma00481	CP	%	106			70-130	Pass	
g-HCH (Lindane)	K22-Ma00481	CP	%	95			70-130	Pass	
Heptachlor	K22-Ma00481	CP	%	127			70-130	Pass	
Heptachlor epoxide	K22-Ma00481	CP	%	105			70-130	Pass	
Hexachlorobenzene	K22-Ma00481	CP	%	106			70-130	Pass	
Methoxychlor	K22-Ma00481	CP	%	130			70-130	Pass	
trans-Chlordane	K22-Ma00481	CP	%	108			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ma00491	CP	%	120			70-130	Pass	
2.4'-DDE	K22-Ma00491	CP	%	101			70-130	Pass	
2.4'-DDT	K22-Ma00491	CP	%	129			70-130	Pass	
4.4'-DDD	K22-Ma00491	CP	%	122			70-130	Pass	
4.4'-DDE	K22-Ma00491	CP	%	116			70-130	Pass	
a-HCH	K22-Ma00491	CP	%	97			70-130	Pass	
Aldrin	K22-Ma00491	CP	%	83			70-130	Pass	
b-HCH	K22-Ma00491	CP	%	90			70-130	Pass	
Chlordanes - Total	K22-Ma00491	CP	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
cis-Chlordane	K22-Ma00491	CP	%	109			70-130	Pass	
d-HCH	K22-Ma00491	CP	%	95			70-130	Pass	
Dieldrin	K22-Ma00491	CP	%	114			70-130	Pass	
Endosulfan I	K22-Ma00491	CP	%	81			70-130	Pass	
Endosulfan II	K22-Ma00491	CP	%	98			70-130	Pass	
Endosulfan sulphate	K22-Ma00491	CP	%	123			70-130	Pass	
Endrin	K22-Ma00491	CP	%	92			70-130	Pass	
Endrin aldehyde	K22-Ma00491	CP	%	74			70-130	Pass	
Endrin ketone	K22-Ma00491	CP	%	83			70-130	Pass	
g-HCH (Lindane)	K22-Ma00491	CP	%	73			70-130	Pass	
Heptachlor epoxide	K22-Ma00491	CP	%	99			70-130	Pass	
Hexachlorobenzene	K22-Ma00491	CP	%	89			70-130	Pass	
trans-Chlordane	K22-Ma00491	CP	%	101			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Ma00491	CP	%	84			70-130	Pass	
Acenaphthylene	K22-Ma00491	CP	%	83			70-130	Pass	
Anthracene	K22-Ma00491	CP	%	106			70-130	Pass	
Benz(a)anthracene	K22-Ma00491	CP	%	73			70-130	Pass	
Benzo(a)pyrene	K22-Ma00491	CP	%	78			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Ma00491	CP	%	78			70-130	Pass	
Benzo(k)fluoranthene	K22-Ma00491	CP	%	81			70-130	Pass	
Chrysene	K22-Ma00491	CP	%	76			70-130	Pass	
Dibenz(a.h)anthracene	K22-Ma00491	CP	%	90			70-130	Pass	
Fluoranthene	K22-Ma00491	CP	%	111			70-130	Pass	
Fluorene	K22-Ma00491	CP	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ma00491	CP	%	83			70-130	Pass	
Naphthalene	K22-Ma00491	CP	%	79			70-130	Pass	
Phenanthrene	K22-Ma00491	CP	%	101			70-130	Pass	
Pyrene	K22-Ma00491	CP	%	124			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C36 (Total)	K22-Ma00493	CP	%	124			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Benz(a)anthracene	K22-Fe53035	NCP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	K22-Fe57042	NCP	%	97			70-130	Pass	
Benzo(g.h.i)perylene	K22-Fe57042	NCP	%	74			70-130	Pass	
Benzo(k)fluoranthene	K22-Fe57042	NCP	%	108			70-130	Pass	
Dibenz(a.h)anthracene	K22-Fe57042	NCP	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	K22-Fe57042	NCP	%	83			70-130	Pass	
Phenanthrene	K22-Fe53035	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K22-Ma00499	CP	%	83			75-125	Pass	
Cadmium	K22-Ma00499	CP	%	81			75-125	Pass	
Chromium	K22-Ma00499	CP	%	86			75-125	Pass	
Copper	K22-Ma00499	CP	%	85			75-125	Pass	
Mercury	K22-Ma00499	CP	%	94			75-125	Pass	
Nickel	K22-Ma00499	CP	%	84			75-125	Pass	
Zinc	K22-Ma00499	CP	%	88			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K22-Ma00504	CP	%	113			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4'-DDE	K22-Ma00504	CP	%	102			70-130	Pass	
2.4'-DDT	K22-Ma00504	CP	%	78			70-130	Pass	
4.4'-DDD	K22-Ma00504	CP	%	118			70-130	Pass	
4.4'-DDE	K22-Ma00504	CP	%	106			70-130	Pass	
a-HCH	K22-Ma00504	CP	%	85			70-130	Pass	
Aldrin	K22-Ma00504	CP	%	96			70-130	Pass	
Chlordanes - Total	K22-Ma00504	CP	%	123			70-130	Pass	
cis-Chlordane	K22-Ma00504	CP	%	122			70-130	Pass	
d-HCH	K22-Ma00504	CP	%	72			70-130	Pass	
Dieldrin	K22-Ma00504	CP	%	89			70-130	Pass	
Endosulfan I	K22-Ma00504	CP	%	93			70-130	Pass	
Endosulfan II	K22-Ma00504	CP	%	95			70-130	Pass	
Endosulfan sulphate	K22-Ma00504	CP	%	94			70-130	Pass	
Endrin	K22-Ma00504	CP	%	96			70-130	Pass	
Endrin aldehyde	K22-Ma00504	CP	%	74			70-130	Pass	
Endrin ketone	K22-Ma00504	CP	%	93			70-130	Pass	
Heptachlor	K22-Ma00504	CP	%	81			70-130	Pass	
Heptachlor epoxide	K22-Ma00504	CP	%	126			70-130	Pass	
Hexachlorobenzene	K22-Ma00504	CP	%	102			70-130	Pass	
trans-Chlordane	K22-Ma00504	CP	%	124			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K22-Ma00504	CP	%	87			70-130	Pass	
Acenaphthylene	K22-Ma00504	CP	%	79			70-130	Pass	
Anthracene	K22-Ma00504	CP	%	74			70-130	Pass	
Benzo(a)pyrene	K22-Ma00504	CP	%	86			70-130	Pass	
Chrysene	K22-Ma00504	CP	%	108			70-130	Pass	
Fluoranthene	K22-Ma00504	CP	%	88			70-130	Pass	
Fluorene	K22-Ma00504	CP	%	79			70-130	Pass	
Naphthalene	K22-Ma00504	CP	%	86			70-130	Pass	
Pyrene	K22-Ma00504	CP	%	74			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-HCH	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
Heptachlor	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ma00480	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ma00487	CP	mg/kg	3.6	3.5	2.0	30%	Pass	
Cadmium	K22-Ma00487	CP	mg/kg	0.54	0.53	2.0	30%	Pass	
Chromium	K22-Ma00487	CP	mg/kg	11	10	2.0	30%	Pass	
Copper	K22-Ma00487	CP	mg/kg	33	31	5.0	30%	Pass	
Lead	K22-Ma00487	CP	mg/kg	13	13	3.0	30%	Pass	
Mercury	K22-Ma00487	CP	mg/kg	0.44	0.45	3.0	30%	Pass	
Nickel	K22-Ma00487	CP	mg/kg	5.3	8.1	42	30%	Fail	Q02
Zinc	K22-Ma00487	CP	mg/kg	17	17	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ma00489	CP	%	19	19	1.0	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K22-Ma00490	CP	mg/kg	0.01	0.01	4.0	30%	Pass	
4.4'-DDD	K22-Ma00490	CP	mg/kg	0.02	0.04	13	30%	Pass	
4.4'-DDE	K22-Ma00490	CP	mg/kg	0.12	0.12	2.0	30%	Pass	
4.4'-DDT	K22-Ma00490	CP	mg/kg	0.22	0.24	9.0	30%	Pass	
a-HCH	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ma00490	CP	mg/kg	0.02	0.02	2.0	30%	Pass	
Endosulfan I	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Hexachlorobenzene	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ma00490	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K22-Ma00490	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ma00490	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K22-Ma03771	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K22-Ma03771	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K22-Ma03771	NCP	mg/kg	< 20	21	22	30%	Pass	
TPH-SG C7-C36 (Total)	K22-Ma03771	NCP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ma00498	CP	mg/kg	1.2	1.1	6.0	30%	Pass	
Cadmium	K22-Ma00498	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chromium	K22-Ma00498	CP	mg/kg	11	12	7.0	30%	Pass	
Copper	K22-Ma00498	CP	mg/kg	2.4	2.6	4.0	30%	Pass	
Lead	K22-Ma00498	CP	mg/kg	3.3	3.2	3.0	30%	Pass	
Mercury	K22-Ma00498	CP	mg/kg	0.04	0.05	23	30%	Pass	
Nickel	K22-Ma00498	CP	mg/kg	1.6	1.7	9.0	30%	Pass	
Zinc	K22-Ma00498	CP	mg/kg	5.3	5.8	9.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K22-Ma00500	CP	%	56	56	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K22-Ma00503	CP	mg/kg	0.01	0.01	23	30%	Pass	
4.4'-DDD	K22-Ma00503	CP	mg/kg	0.01	0.01	42	30%	Fail	Q15
4.4'-DDE	K22-Ma00503	CP	mg/kg	0.04	0.04	16	30%	Pass	
4.4'-DDT	K22-Ma00503	CP	mg/kg	0.06	0.04	56	30%	Fail	Q15
a-HCH	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-HCH	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-HCH	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K22-Ma00503	CP	mg/kg	0.09	0.04	72	30%	Fail	Q15
Endosulfan I	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-HCH (Lindane)	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
Hexachlorobenzene	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K22-Ma00503	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K22-Ma00503	CP	mg/kg	0.05	< 0.03	39	30%	Fail	Q15
Benzo(a)pyrene	K22-Ma00503	CP	mg/kg	0.05	0.06	12	30%	Pass	
Benzo(b&j)fluoranthene	K22-Ma00503	CP	mg/kg	0.09	0.08	16	30%	Pass	
Benzo(g.h.i)perylene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K22-Ma00503	CP	mg/kg	0.09	0.09	4.0	30%	Pass	
Chrysene	K22-Ma00503	CP	mg/kg	0.05	0.05	7.0	30%	Pass	
Dibenz(a.h)anthracene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K22-Ma00503	CP	mg/kg	0.08	0.08	1.0	30%	Pass	
Fluorene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K22-Ma00503	CP	mg/kg	0.04	< 0.03	25	30%	Pass	
Naphthalene	K22-Ma00503	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K22-Ma00503	CP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K22-Ma00503	CP	mg/kg	0.08	0.06	19	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K22-Ma00508	CP	mg/kg	8.5	9.0	5.0	30%	Pass	
Cadmium	K22-Ma00508	CP	mg/kg	0.77	0.83	7.0	30%	Pass	
Chromium	K22-Ma00508	CP	mg/kg	12	13	4.0	30%	Pass	
Copper	K22-Ma00508	CP	mg/kg	76	76	<1	30%	Pass	
Lead	K22-Ma00508	CP	mg/kg	72	76	5.0	30%	Pass	
Mercury	K22-Ma00508	CP	mg/kg	0.37	0.39	7.0	30%	Pass	
Nickel	K22-Ma00508	CP	mg/kg	8.9	9.3	5.0	30%	Pass	
Zinc	K22-Ma00508	CP	mg/kg	540	550	2.0	30%	Pass	

Comments

Eurofins | Environment Testing accreditation number 1261, site 18217 is currently in progress of a controlled transition to a new custom built location at 179 Magowar Road, Girraween, NSW 2145. All results on this report denoted as being performed by Eurofins | Environment Testing Unit F3, Building F, 16 Mars road, Lane Cove West, NSW 2066, corporate site 18217, will have been performed on either Lane Cove or new Girraween site

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Karishma Patel	Analytical Services Manager
Daren Yang	Senior Analyst-Organic (NZN)
Michael Ritchie	Senior Analyst-Metal (NZN)
Michael Ritchie	Senior Analyst-Organic (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

eurofins | Environment Testing

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention:	Jordan Vaughn
Report	867691-AID
Project Name	
Project ID	21710
Received Date	Mar 02, 2022
Date Reported	Mar 09, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 21710
Date Sampled Mar 01, 2022
Report 867691-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S38	22-Ma03400	Mar 01, 2022	Approximate Sample 413g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S39	22-Ma03401	Mar 01, 2022	Approximate Sample 534g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S40	22-Ma03402	Mar 01, 2022	Approximate Sample 504g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S47	22-Ma03403	Mar 01, 2022	Approximate Sample 758g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S61	22-Ma03404	Mar 01, 2022	Approximate Sample 394g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S65	22-Ma03405	Mar 01, 2022	Approximate Sample 554g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
S66	22-Ma03406	Mar 01, 2022	Approximate Sample 454g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Mar 02, 2022	Indefinite

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NATA # 1261 Site # 25079

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ABN: 91 05 0159 898

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Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867691
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 2, 2022 8:00 AM
Due: Mar 9, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											X
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMPOSITE 19	Mar 01, 2022		Soil	K22-Ma03395		X	X	X		
2	S19-1	Mar 01, 2022		Soil	K22-Ma03396	X					
3	S19-2	Mar 01, 2022		Soil	K22-Ma03397	X					
4	S19-3	Mar 01, 2022		Soil	K22-Ma03398	X					
5	S19-4	Mar 01, 2022		Soil	K22-Ma03399	X					
6	S38	Mar 01, 2022		Soil	K22-Ma03400		X	X		X	X
7	S39	Mar 01, 2022		Soil	K22-Ma03401		X	X		X	X
8	S40	Mar 01, 2022		Soil	K22-Ma03402		X	X		X	X
9	S47	Mar 01, 2022		Soil	K22-Ma03403		X	X		X	X
10	S61	Mar 01, 2022		Soil	K22-Ma03404		X				X
11	S65	Mar 01, 2022		Soil	K22-Ma03405		X				X

eurofins | Environment Testing

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Order No.:
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Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 2, 2022 8:00 AM
Due: Mar 9, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											X
External Laboratory											
12	S66	Mar 01, 2022		Soil	K22-Ma03406		X				X
Test Counts						4	8	5	1	4	7

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Destiny Cruickshanks	Senior Analyst-Asbestos (NZS)

Authorised by:

Katyana Gausel	Senior Analyst-Asbestos (Key Technical Personnel) (NZS)

Destiny Cruickshanks
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention:	Jordan Vaughn
Report	877177-AID
Project Name	
Project ID	21529
Received Date	Apr 05, 2022
Date Reported	Apr 12, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 21529
Date Sampled Apr 04, 2022
Report 877177-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S47	22-Ap0006783	Apr 04, 2022	Approximate Sample 120g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S64	22-Ap0006784	Apr 04, 2022	Approximate Sample 167g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Auckland	Apr 07, 2022	Indefinite

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IANZ # 1327

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21529

Order No.:
Report #: 877177
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Apr 5, 2022 1:01 PM
Due: Apr 12, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMP S25	Apr 04, 2022		Soil	K22-Ap0006779		X	X	X		
2	COMP S26	Apr 04, 2022		Soil	K22-Ap0006780		X	X	X		
3	S25-2D	Apr 04, 2022		Soil	K22-Ap0006781		X	X	X		
4	S46	Apr 04, 2022		Soil	K22-Ap0006782		X	X	X	X	
5	S47	Apr 04, 2022		Soil	K22-Ap0006783		X	X		X	X
6	S64	Apr 04, 2022		Soil	K22-Ap0006784		X				X
7	S25-1	Apr 04, 2022		Soil	K22-Ap0006785	X					

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21529

Order No.:
Report #: 877177
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Apr 5, 2022 1:01 PM
Due: Apr 12, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
8	S25-2	Apr 04, 2022		Soil	K22-Ap0006786	X					
9	S25-3	Apr 04, 2022		Soil	K22-Ap0006787	X					
10	S25-4	Apr 04, 2022		Soil	K22-Ap0006788	X					
11	S26-1	Apr 04, 2022		Soil	K22-Ap0006789	X					
12	S26-2	Apr 04, 2022		Soil	K22-Ap0006790	X					
13	S26-3	Apr 04, 2022		Soil	K22-Ap0006791	X					
14	S26-4	Apr 04, 2022		Soil	K22-Ap0006792	X					
Test Counts						8	6	5	4	2	2

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

All samples received were deemed to be too large for AS4964, i.e. more than about 100 g. It was therefore necessary to reduce their size to that which could be thoroughly examined. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Laura Liu	Senior Analyst-Asbestos

Authorised by:

Kate Stuart	Senior Analyst-Asbestos (NZS)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention:	Jordan Vaughn
Report	855913-AID
Project Name	
Project ID	21710
Received Date	Jan 18, 2022
Date Reported	Jan 19, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 21710
Date Sampled Jan 17, 2022
Report 855913-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S43	22-Ja14096	Jan 17, 2022	Approximate Sample 319g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S44	22-Ja14097	Jan 17, 2022	Approximate Sample 878g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S45	22-Ja14098	Jan 17, 2022	Approximate Sample 403g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Auckland	Jan 19, 2022	Indefinite

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NATA # 1261 Site # 20794

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NATA # 1261 Site # 25079

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
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Project Name:
Project ID: 21710

Order No.:
Report #: 855913
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Jan 18, 2022 7:30 AM
Due: Jan 19, 2022
Priority: 1 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	COMPOSITE S21	Jan 17, 2022		Soil	K22-Ja14094		X	X	X		
2	COMPOSITE S22	Jan 17, 2022		Soil	K22-Ja14095		X	X	X		
3	S43	Jan 17, 2022		Soil	K22-Ja14096		X			X	X
4	S44	Jan 17, 2022		Soil	K22-Ja14097		X			X	X
5	S45	Jan 17, 2022		Soil	K22-Ja14098		X			X	X
6	S21-3D	Jan 17, 2022		Soil	K22-Ja14099		X	X	X		
7	S21-1	Jan 17, 2022		Soil	K22-Ja14100	X					
8	S21-2	Jan 17, 2022		Soil	K22-Ja14101	X					
9	S21-3	Jan 17, 2022		Soil	K22-Ja14102	X					
10	S21-4	Jan 17, 2022		Soil	K22-Ja14103	X					
11	S22-1	Jan 17, 2022		Soil	K22-Ja14104	X					

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 855913
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Jan 18, 2022 7:30 AM
Due: Jan 19, 2022
Priority: 1 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290											
External Laboratory											
12	S22-2	Jan 17, 2022		Soil	K22-Ja14105	X					
13	S22-3	Jan 17, 2022		Soil	K22-Ja14106	X					
14	S22-4	Jan 17, 2022		Soil	K22-Ja14107	X					
Test Counts						8	6	3	3	3	3

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \frac{}{a} \times \frac{}{n} \times \frac{}{r} \times \frac{}{t} = K \times \frac{}{n} \times \frac{}{V}$

Asbestos Content (as asbestos): $\%\ w/w = \frac{(m \times PA)}{M}$

Weighted Average (of asbestos): $\%_W = \Sigma \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Compliant	Indicates the item has been assessed against the relevant criteria, e.g. NATA SAC_07.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
N/A	Not Applicable. Indicates a result or assessment is not required or applicable to that item.
NATA	National Association of Testing Authorities, Australia.
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SAC_07	Specific Accreditation Criteria: ISO/IEC 17025 Application Document, Life Sciences – Annex, Asbestos sampling and testing.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos- Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Laura Liu	Senior Analyst-Asbestos

Authorised by:

Katyana Gausel	Senior Analyst-Asbestos (Key Technical Personnel) (NSW)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Soil & Rock Consultants
Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Attention:	Jordan Vaughn
Report	867278-AID
Project Name	
Project ID	21710
Received Date	Mar 01, 2022
Date Reported	Mar 09, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 21710
Date Sampled Feb 28, 2022
Report 867278-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S27	22-Ma00493	Feb 28, 2022	Approximate Sample 630g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S28	22-Ma00494	Feb 28, 2022	Approximate Sample 563g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S48	22-Ma00495	Feb 28, 2022	Approximate Sample 627g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S49	22-Ma00496	Feb 28, 2022	Approximate Sample 483g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
ASB-2	22-Ma00497	Feb 28, 2022	Approximate Sample 148g / 150 x 80 x 5mm Sample consisted of: Fibre cement	Chrysotile and amosite asbestos detected.
S29	22-Ma00499	Feb 28, 2022	Approximate Sample 722g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S36	22-Ma00503	Feb 28, 2022	Approximate Sample 643g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S37	22-Ma00504	Feb 28, 2022	Approximate Sample 617g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S41	22-Ma00505	Feb 28, 2022	Approximate Sample 427g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S58	22-Ma00506	Feb 28, 2022	Approximate Sample 576g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S59	22-Ma00507	Feb 28, 2022	Approximate Sample 703g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S60	22-Ma00508	Feb 28, 2022	Approximate Sample 538g Sample consisted of: Fine grained soil and rocks	FA: Chrysotile asbestos detected in weathered fibre cement fragments. Approximate raw weight of FA = 0.018g Estimated asbestos content in FA = 0.013g* Total estimated asbestos concentration in FA = 0.0024% w/w* Organic fibre detected. No trace asbestos detected.
ASB-1	22-Ma00509	Feb 28, 2022	Approximate Sample 150g / 120 x 110 x 5mm Sample consisted of: Fibre cement	Chrysotile and amosite asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Auckland	Mar 07, 2022	Indefinite
Asbestos - LTM-ASB-8020	Auckland	Mar 07, 2022	Indefinite
Asbestos - LTM-ASB-8020	Auckland	Mar 07, 2022	Indefinite

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	CS01	Feb 28, 2022		Soil	K22-Ma00480			X	X	X			
2	CS02	Feb 28, 2022		Soil	K22-Ma00481			X	X	X			
3	CS03	Feb 28, 2022		Soil	K22-Ma00482			X	X	X			
4	CS04	Feb 28, 2022		Soil	K22-Ma00483			X	X	X			
5	CS05	Feb 28, 2022		Soil	K22-Ma00484			X	X	X			
6	CS13	Feb 28, 2022		Soil	K22-Ma00485			X	X	X			
7	CS14	Feb 28, 2022		Soil	K22-Ma00486			X	X	X			
8	CS101	Feb 28, 2022		Soil	K22-Ma00487			X	X	X			
9	CS15	Feb 28, 2022		Soil	K22-Ma00488			X	X	X			
10	CS16	Feb 28, 2022		Soil	K22-Ma00489			X	X	X			
11	CS18	Feb 28, 2022		Soil	K22-Ma00490			X	X	X			
12	S01-2D	Feb 28, 2022		Soil	K22-Ma00491			X	X	X			

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Company Name: Soil & Rock Consultants
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NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
13	S03-2D	Feb 28, 2022		Soil	K22-Ma00492			X	X	X			
14	S27	Feb 28, 2022		Soil	K22-Ma00493			X	X		X	X	
15	S28	Feb 28, 2022		Soil	K22-Ma00494			X	X		X	X	
16	S48	Feb 28, 2022		Soil	K22-Ma00495			X				X	
17	S49	Feb 28, 2022		Soil	K22-Ma00496			X				X	
18	ASB-2	Feb 28, 2022		Building Materials	K22-Ma00497	X							
19	S04-2D	Feb 28, 2022		Soil	K22-Ma00498			X	X	X			
20	S29	Feb 28, 2022		Soil	K22-Ma00499			X	X		X	X	
21	S13-4D	Feb 28, 2022		Soil	K22-Ma00500			X	X	X			
22	S15-4D	Feb 28, 2022		Soil	K22-Ma00501			X	X	X			
23	S18-2D	Feb 28, 2022		Soil	K22-Ma00502			X	X	X			
24	S36	Feb 28, 2022		Soil	K22-Ma00503			X	X		X	X	
25	S37	Feb 28, 2022		Soil	K22-Ma00504			X	X		X	X	

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Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
26	S41	Feb 28, 2022		Soil	K22-Ma00505			X	X		X	X	
27	S58	Feb 28, 2022		Soil	K22-Ma00506			X				X	
28	S59	Feb 28, 2022		Soil	K22-Ma00507			X				X	
29	S60	Feb 28, 2022		Soil	K22-Ma00508			X					X
30	ASB-1	Feb 28, 2022		Building Materials	K22-Ma00509	X							
31	S01-1	Feb 28, 2022		Soil	K22-Ma00510		X						
32	S01-2	Feb 28, 2022		Soil	K22-Ma00511		X						
33	S01-3	Feb 28, 2022		Soil	K22-Ma00512		X						
34	S01-4	Feb 28, 2022		Soil	K22-Ma00513		X						
35	S02-1	Feb 28, 2022		Soil	K22-Ma00514		X						
36	S02-2	Feb 28, 2022		Soil	K22-Ma00515		X						
37	S02-3	Feb 28, 2022		Soil	K22-Ma00516		X						
38	S02-4	Feb 28, 2022		Soil	K22-Ma00517		X						

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
39	S03-1	Feb 28, 2022		Soil	K22-Ma00518		X						
40	S03-2	Feb 28, 2022		Soil	K22-Ma00519		X						
41	S03-3	Feb 28, 2022		Soil	K22-Ma00520		X						
42	S03-4	Feb 28, 2022		Soil	K22-Ma00521		X						
43	S04-1	Feb 28, 2022		Soil	K22-Ma00522		X						
44	S04-2	Feb 28, 2022		Soil	K22-Ma00523		X						
45	S04-3	Feb 28, 2022		Soil	K22-Ma00524		X						
46	S04-4	Feb 28, 2022		Soil	K22-Ma00525		X						
47	S05-1	Feb 28, 2022		Soil	K22-Ma00526		X						
48	S05-2	Feb 28, 2022		Soil	K22-Ma00527		X						
49	S05-3	Feb 28, 2022		Soil	K22-Ma00528		X						
50	S05-4	Feb 28, 2022		Soil	K22-Ma00529		X						
51	S13-1	Feb 28, 2022		Soil	K22-Ma00530		X						
52	S13-2	Feb 28, 2022		Soil	K22-Ma00531		X						

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NATA # 2377 Site # 2370

Company Name: Soil & Rock Consultants
Address: Level 1, 131 Lincoln Rd Henderson
Auckland
NEW ZEALAND

Project Name:
Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
53	S13-3	Feb 28, 2022		Soil	K22-Ma00532		X						
54	S13-4	Feb 28, 2022		Soil	K22-Ma00533		X						
55	S14-1	Feb 28, 2022		Soil	K22-Ma00534		X						
56	S14-2	Feb 28, 2022		Soil	K22-Ma00535		X						
57	S14-3	Feb 28, 2022		Soil	K22-Ma00536		X						
58	S14-4	Feb 28, 2022		Soil	K22-Ma00537		X						
59	S101-1	Feb 28, 2022		Soil	K22-Ma00538		X						
60	S101-2	Feb 28, 2022		Soil	K22-Ma00539		X						
61	S101-3	Feb 28, 2022		Soil	K22-Ma00540		X						
62	S101-4	Feb 28, 2022		Soil	K22-Ma00541		X						
63	S15-1	Feb 28, 2022		Soil	K22-Ma00542		X						
64	S15-2	Feb 28, 2022		Soil	K22-Ma00543		X						
65	S15-3	Feb 28, 2022		Soil	K22-Ma00544		X						
66	S15-4	Feb 28, 2022		Soil	K22-Ma00545		X						

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Project ID: 21710

Order No.:
Report #: 867278
Phone: 0011 64 9 835 1740
Fax: 0011 64 9 835 1847

Received: Mar 1, 2022 12:00 PM
Due: Mar 8, 2022
Priority: 5 Day
Contact Name: Jordan Vaughn

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Asbestos Absence /Presence	HOLD	Moisture Set	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Eurofins Suite B4B-NZ: TPH, PAH (NZ MfE)	Eurofins Suite B21A-NZ: Asbestos, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)	Eurofins Suite B21B-NZ: Asbestos NEPM, Metals (As,Cd,Cr,Cu,Ni,Pb,Zn,Hg) (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X	X	X	X	X	X	X
Christchurch Laboratory - IANZ# 1290													
External Laboratory													
67	S16-1	Feb 28, 2022		Soil	K22-Ma00546		X						
68	S16-2	Feb 28, 2022		Soil	K22-Ma00547		X						
69	S16-3	Feb 28, 2022		Soil	K22-Ma00548		X						
70	S16-4	Feb 28, 2022		Soil	K22-Ma00549		X						
71	S18-1	Feb 28, 2022		Soil	K22-Ma00550		X						
72	S18-2	Feb 28, 2022		Soil	K22-Ma00551		X						
73	S18-3	Feb 28, 2022		Soil	K22-Ma00552		X						
74	S18-4	Feb 28, 2022		Soil	K22-Ma00553		X						
Test Counts						2	44	28	23	17	6	10	1

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Laura Liu	Senior Analyst-Asbestos

Authorised by:

Katyana Gausel	Senior Analyst-Asbestos (Key Technical Personnel) (NSW)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Melbourne Laboratory
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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	12:00 1/3/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are required, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	TPH, PAH	Asbestos ID, Metals NZ														Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S19-1	1 Mar 2022	Soil																								1		
2	S19-2	1 Mar 2022	Soil																								1		
3	S19-3	1 Mar 2022	Soil																								1		
4	S19-4	1 Mar 2022	Soil																								1		
5	S38	1 Mar 2022	Soil		X	X	X	X																			1	1	
6	S39	1 Mar 2022	Soil		X	X	X	X																			1	1	
7	S40	1 Mar 2022	Soil		X	X	X	X																			1	1	
8	S47	1 Mar 2022	Soil		X	X	X	X																			1	1	
9	S61	1 Mar 2022	Soil					X																			1	1	
10	S65	1 Mar 2022	Soil					X																			1	1	
	Total Counts																												

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only									
Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Temperature	
Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Report №	

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ **Wellington Office** 85 Port Road, Seaview, Lower Hutt 5011, NZ 0800 856450 (free dial) OnurMehmet@eurofins.com

☐ **Christchurch Office** 43 Detroit Drive Rolleston 7675, NZ 0800 856450 (free dial) OnurMehmet@eurofins.com

☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166, AU +61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn	Project Name	-
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710	Report Format	pdf, xls
Contact Name	Jordan Vaughn					Email for Results	Jordan.Vaughn@soilandrock.co.nz
Phone №	021 926 626					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.					Method of Shipment	☑ Courier (#) ☐ Hand Delivered ☐ Postal
Relinquished by (Signature) (Time / Date)	[signature] 12:00 1/3/22						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Meatls NZ)	Organochlorine Pesticides (OCP)	TPH, PAH	Asbestos ID, Metals NZ												1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S66	1 Mar 2022	Soil					X																	1	1	
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
Total Counts																											

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature		Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature		Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins Standard Terms and Conditions is available on request.

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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	If Asbestos is detected, please analys for Asbestos Quantitation				
Relinquished by (Signature)					
(Time / Date)	10:30 5/4/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are to be analysed, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides	B21A-NZ (Asbestos ID, Metals-NZ)	B4B (TPH, PAH)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S25-1	4 April 2022	Soil	COMP (S25)	X									1		
2	S25-2	4 April 2022	Soil											1		
3	S25-3	4 April 2022	Soil											1		
4	S25-4	4 April 2022	Soil											1		
5	S26-1	4 April 2022	Soil	COMP (S26)	X									1		
6	S26-2	4 April 2022	Soil											1		
7	S26-3	4 April 2022	Soil											1		
8	S26-4	4 April 2022	Soil											1		
9	S25-2D	4 April 2022	Soil	X	X									1		
10	S46	4 April 2022	Soil		X	X	X							1	1	
	Total Counts															

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Report №

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Auckland Office
35 O'Rorke Road, Penrose, Auckland 1061, NZ
0800 856450 (free dial) OnurMehmet@eurofins.com

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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166, AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	If Asbestos is detected, please further analyse for Asbestos Quantitative				
Relinquished by (Signature)					
(Time / Date)	10:00 5/4/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides	B21A-NZ (Asbestos ID, Metals-NZ)	B4B (TPH, PAH)														Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mLvial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S47	4 April 2022	Soil		X	X	X																				1	1	
2	S64	4 April 2022	Soil			X																					1	1	
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
	Total Counts																												

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only									
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Report №

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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	S21 through S24 are composite samples (4 individual sampels per composit) If Asbestos is detected, please analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	__:__ __/__/__				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S21-1	10 Jan 2022	Soil									1	1	
2	S21-2	10 Jan 2022	Soil									1	1	
3	S21-3	10 Jan 2022	Soil									1	1	
4	S21-4	10 Jan 2022	Soil									1	1	
5	S22-1	10 Jan 2022	Soil									1	1	
6	S22-2	10 Jan 2022	Soil									1	1	
7	S22-3	10 Jan 2022	Soil									1	1	
8	S22-4	10 Jan 2022	Soil									1	1	
9	S23-1	10 Jan 2022	Soil									1	1	
10	S23-2	10 Jan 2022	Soil									1	1	
	Total Counts													

Containers — Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Date/Time: 11/1/22
Chilled: Yes / No
Temp: 9.4
Correction: +0.1
Final Temp: 9.5

Laboratory Use Only	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature	
	Received By	Karishma Patel	AUCK | WELL | CHCH | MELB	Date	11/1/22	Time	__:__	Signature	

Temperature:
Report №:

QS3106_R2 Modified by: S. Kojima Approved by: G. Jackson Approved on: 19 October 2016

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166, AU
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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	S21 through S24 are composite samples (4 individual sampels per composit) If Asbestos is detected, please analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	___:___ __/__/__				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered".)

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	B4B-NZ (TPH, PAH)	B21A-NZ (Metals + Asbestos ID)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S23-3	10 Jan 2022	Soil											1	1	
2	S23-4	10 Jan 2022	Soil											1	1	
3	S24-1	10 Jan 2022	Soil											1	1	
4	S24-2	10 Jan 2022	Soil											1	1	
5	S24-3	10 Jan 2022	Soil											1	1	
6	S24-4	10 Jan 2022	Soil											1	1	
7	S22-2D	10 Jan 2022	Soil	X	X									1	1	
8	S24-2D	10 Jan 2022	Soil	X	X									1	1	
9	S43	10 Jan 2022	Soil		X	X	X							1	1	
10	S44	10 Jan 2022	Soil		X	X	X							1	1	
	Total Counts															

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only									
Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	___:___	Signature	Temperature
Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	___:___	Signature	Report №

CHAIN OF CUSTODY RECORD

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☐ Melbourne Laboratory
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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	S21 through S24 are composite samples (4 individual sampels per composit) If Asbestos is detected, please analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	___:___ __/__/__				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochorine Pesticides (OCP)	B4B-NZ (TPH, PAH)	B21A-NZ (Metals + Asbestos ID)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S45	10 Jan 2022	Soil		X	X	X							1	1	
2																
3																
4																
5																
6																
7																
8																
9																
10																
	Total Counts															

Containers

Method of Shipment
☑ Courier (#)
☐ Hand Delivered
☐ Postal

Laboratory Use Only									
Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	___:___	Signature	Temperature
Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	___:___	Signature	Report №

QS3106_R2 Modified by: S. Kojima Approved by: G. Jackson Approved on: 19 October 2016

CHAIN OF CUSTODY RECORD

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☐ Melbourne Laboratory
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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	S21 through S24 are composite samples (4 individual sampels per composit) If Asbestos is detected, please analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	3:40 17/1/22				

Project Name		
Report Format	pdf, xls	
Email for Results	Jordan.Vaughn@soilandrock.co.nz	
Turn Around Requirements	☑ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☐ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply	

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochorine Pesticides (OCP)	B4B-NZ (TPH, PAH)	B21A-NZ (Metals + Asbestos ID)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S21-1	17 Jan 2022	Soil	X	X									1		
2	S21-2	17 Jan 2022	Soil	X	X									1		composit "S21"
3	S21-3	17 Jan 2022	Soil	X	X									1		
4	S21-4	17 Jan 2022	Soil	X	X									1		
5	S22-1	17 Jan 2022	Soil	X	X									1		
6	S22-2	17 Jan 2022	Soil	X	X									1		composit S22
7	S22-3	17 Jan 2022	Soil	X	X									1		
8	S22-4	17 Jan 2022	Soil	X	X									1		
9	S43	17 Jan 2022	Soil			X	X							1	1	
10	S44	17 Jan 2022	Soil			X	X							1	1	
	Total Counts															

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only									
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	

Temperature

Report №

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Melbourne Laboratory
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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	S21 through S24 are composite samples (4 individual sampels per composit) If Asbestos is detected, please analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	3:40 17/1/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☑ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☐ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	B4B-NZ (TPH, PAH)	B21A-NZ (Metals + Asbestos ID)															Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S45	17 Jan 2022	Soil			X	X																					1	1	
2	S21-3D	17 Jan 2022	Soil	X	X																									
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
	Total Counts																													

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only								
Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Temperature	
Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Report №	

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ **Melbourne Laboratory**
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+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	**Purchase Order**		**Project Manager**	Jordan Vaughn	**Project Name**	-
Address	Level 1, 131 Lincoln Road, Henderson	**Quote ID №**		**Project №**	21710	**Report Format**	pdf, xls
Contact Name	Jordan Vaughn					**Email for Results**	Jordan.Vaughn@soilandrock.co.nz
Phone №	021 926 626					**Turn Around Requirements**	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.						
Relinquished by (Signature) (Time / Date)	09:30 1/3/22						

				Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")		Containers								Method of Shipment
№	**Client Sample ID**	**Date**	**Matrix**	Asbestos ID, Metals NZ	M8-NZ (Heavy Metals - NZ)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	☑ Courier (#) ☐ Hand Delivered ☐ Postal
1	S01-1	28 Feb 2022	Soil	Composite								1		
2	S01-2	28 Feb 2022	Soil									1		
3	S01-3	28 Feb 2022	Soil									1		
4	S01-4	28 Feb 2022	Soil									1		
5	S01-2D	28 Feb 2022	Soil	X	X							1		
6	S02-1	28 Feb 2022	Soil	Composite								1		
7	S02-2	28 Feb 2022	Soil									1		
8	S02-3	28 Feb 2022	Soil									1		
9	S02-4	28 Feb 2022	Soil									1		
10														
	Total Counts													**Sample Comments / DG Hazard Warning**

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Temperature	
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Report №	

CHAIN OF CUSTODY RECORD

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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	2:30 1/3/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where no boxes are ticked, please specify "Test" or "Filtered")

№	Client Sample ID	Date	Matrix	Asbestos ID, Metals NZ	M8-NZ (Heavy Metals - NZ)
1	S03-1	28 Feb 2022	Soil		
2	S03-2	28 Feb 2022	Soil		
3	S03-3	28 Feb 2022	Soil		
4	S03-4	28 Feb 2022	Soil		
5	S03-2D	28 Feb 2022	Soil	X	X
6					
7					
8					
9					
10					
	Total Counts				

Containers

№	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1							1		
2							1		
3							1		
4							1		
5							1		
6									
7									
8									
9									
10									

Method of Shipment

☑ Courier (#)
☐ Hand Delivered
☐ Postal

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Report №

CHAIN OF CUSTODY RECORD

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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn	Project Name	-	Report Format	pdf, xls
Phone №	021 926 626	Email for Results	Jordan.Vaughn@soilandrock.co.nz		
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.	Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) *Surcharges apply		
Relinquished by (Signature) (Time / Date)	[signature] 9:30 1.3.22	Method of Shipment	☑ Courier (#) ☐ Hand Delivered ☐ Postal		

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Asbestos ID, Metals NZ	Organochlorine Pesticides (OCP)	TPH, PAH	Asbestos ID in building material	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S27	28 Feb 2022	Soil	X	X	X								1	1	
2	S28	28 Feb 2022	Soil	X	X	X								1	1	
3	S48	28 Feb 2022	Soil	X										1	1	
4	S49	28 Feb 2022	Soil	X										1	1	
5	ASB-2	28 Feb 2022	Material				X								1	
6																
7																
8																
9																
10																
	Total Counts															

Laboratory Use Only									
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature	Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	**Purchase Order**		**Project Manager**	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	**Quote ID №**		**Project №**	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature) (Time / Date)	9:30 (_)2/22				

Project Name	-	
Report Format	pdf, xls	
Email for Results	Jordan.Vaughn@soilandrock.co.nz	
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply	

Analysis (Note: Where metals are requested, indicate specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	TPH, PAH	Asbestos ID, Metals NZ	**Containers** 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	**Method of Shipment**	**Sample Comments / DG Hazard Warning**
1	S04-1	28 Feb 2022	Soil	X	X									1		☑ Courier (#)	
2	S04-2	28 Feb 2022	Soil											1		☐ Hand Delivered	
3	S04-3	28 Feb 2022	Soil											1		☐ Postal	
4	S04-4	28 Feb 2022	Soil											1			
5	S04-2D	28 Feb 2022	Soil	X	X									1			
6	S05-1	28 Feb 2022	Soil											1			
7	S05-2	28 Feb 2022	Soil	X	X									1			
8	S05-3	28 Feb 2022	Soil											1			
9	S05-4	28 Feb 2022	Soil											1			
10	S29	28 Feb 2022	Soil		X	X	X							1	1		
	Total Counts																

Laboratory Use Only									
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Report №

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Auckland Office
35 O'Rorke Road, Penrose, Auckland 1061, NZ
0800 856450 (free dial) OnurMehmet@eurofins.com

☐ Wellington Office
85 Port Road, Seaview, Lower Hutt 5011, NZ
0800 856450 (free dial) OnurMehmet@eurofins.com

☐ Christchurch Office
43 Detroit Drive Rolleston 7675, NZ
0800 856450 (free dial) OnurMehmet@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166, AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	9:30 1/3/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

№	Client Sample ID	Date	Matrix	Analysis (Note: Where metals are requested, please specify 'Total' or 'Filtered') M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S13-1	28 Feb 2022	Soil		X						1			
2	S13-2	28 Feb 2022	Soil		X						1			
3	S13-3	28 Feb 2022	Soil		X						1			
4	S13-4	28 Feb 2022	Soil		X						1			
5	S13-4D	28 Feb 2022	Soil	X	X						1			
6	S14-1	28 Feb 2022	Soil		X						1			
7	S14-2	28 Feb 2022	Soil		X						1			
8	S14-3	28 Feb 2022	Soil		X						1			
9	S14-4	28 Feb 2022	Soil		X						1			
10														
	Total Counts													

Composite

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Report №

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ **Christchurch Office**
43 Detroit Drive Rolleston 7675, NZ
0800 856450 (free dial) OnurMehmet@eurofins.com

☐ **Melbourne Laboratory**
2 Kingston Town Close, Oakleigh, VIC 3166, AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	Soil & Rock Consultants	**Purchase Order**		**Project Manager**	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	**Quote ID №**		**Project №**	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature)					
(Time / Date)	9:30 1/3/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are required, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)
1	S101-1	28 Feb 2022	Soil		X
2	S101-2	28 Feb 2022	Soil		X
3	S101-3	28 Feb 2022	Soil		X
4	S101-4	28 Feb 2022	Soil		X
5	S15-1	28 Feb 2022	Soil		X
6	S15-2	28 Feb 2022	Soil		X
7	S15-3	28 Feb 2022	Soil		X
8	S15-4	28 Feb 2022	Soil		X
9	S15-4D	28 Feb 2022	Soil	X	X
10					
	Total Counts				

Containers

№	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag
1						1		
2						1		
3						1		
4						1		
5						1		
6						1		
7						1		
8						1		
9						1		
10								

Method of Shipment

☑ Courier (#)
☐ Hand Delivered
☐ Postal

Sample Comments / DG Hazard Warning

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature		Temperature	
	Received By		AUCK | WELL | CHCH | MELB	Date	__/__/__	Time	__:__	Signature		Report №	

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Soil & Rock Consultants	Purchase Order		Project Manager	Jordan Vaughn	Project Name	-
Address	Level 1, 131 Lincoln Road, Henderson	Quote ID №		Project №	21710	Report Format	pdf, xls
Contact Name	Jordan Vaughn					Email for Results	Jordan.Vaughn@soilandrock.co.nz
Phone №	021 926 626					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.						
Relinquished by (Signature) (Time / Date)	1/3/22						

№	Client Sample ID	Date	Matrix	Analysis (Note: Where metals are requested, please specify Total or Filtered) M8-NZ (Metals NZ)	Organochlorine Pesticides (OCP)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	250mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S16-1	28 Feb 2022	Soil								1			
2	S16-2	28 Feb 2022	Soil								1			
3	S16-3	28 Feb 2022	Soil								1			
4	S16-4	28 Feb 2022	Soil								1			
5	S18-1	28 Feb 2022	Soil								1			
6	S18-2	28 Feb 2022	Soil								1			
7	S18-3	28 Feb 2022	Soil								1			
8	S18-4	28 Feb 2022	Soil								1			
9	S18-2D	28 Feb 2022	Soil	X	X						1			
10														
	Total Counts													

Composite

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only										
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Temperature	
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature		Report №	

CHAIN OF CUSTODY RECORD

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Company	Soil & Rock Consultants	**Purchase Order**		**Project Manager**	Jordan Vaughn
Address	Level 1, 131 Lincoln Road, Henderson	**Quote ID №**		**Project №**	21710
Contact Name	Jordan Vaughn				
Phone №	021 926 626				
Special Direction	Please analyse for Asbestos ID. If detected, please further analyse for Asbestos Quantitative.				
Relinquished by (Signature) (Time / Date)	9:30 1/3/22				

Project Name	-
Report Format	pdf, xls
Email for Results	Jordan.Vaughn@soilandrock.co.nz
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std.) ☐ Other ( ) * Surcharges apply

Analysis (Note: Where metals are required, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Asbestos ID, Metals NZ	Organochlorine Pesticides (OCP)	TPH, PAH	Asbestos ID in building material														Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Asbestos bag	Sample Comments / DG Hazard Warning
1	S36	28 Feb 2022	Soil	X	X	X																					1	1	
2	S37	28 Feb 2022	Soil	X	X	X																					1	1	
3	S41	28 Feb 2022	Soil	X	X	X																					1	1	
4	S58	28 Feb 2022	Soil	X																							1	1	
5	S59	28 Feb 2022	Soil	X																							1	1	
6	S60	28 Feb 2022	Soil	X																							1	1	
7	ASB-1	28 Feb 2022	Material				X																					1	
8																													
9																													
10																													
	Total Counts																												

Method of Shipment
☑ Courier (#)
☐ Hand Delivered
☐ Postal

Laboratory Use Only									
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Temperature
	Received By		AUCK | WELL | CHCH | MELB	Date	___/___/___	Time	___:___	Signature	Report №

QS3106_R2 Modified by: S Kojima Approved by: G Jackson Approved on: 19 October 2016

Soil&Rock Consultants

Your responsive & cost-effective engineers

Appendix I

Laboratory Analytical Results and
Chain of Custody Documentation
(Focus DSI, 2018)

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2051217	SPv2
Contact:	David O'Reilly	**Date Received:**	19-Sep-2018	
	C/- Focus Environmental Services Limited	**Date Reported:**	04-Oct-2018	**(Amended)**
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1139.001	
		Submitted By:	Shane Dolan	

Sample Type: Soil

	Sample Name:	COMP01 A 18-Sep-2018	COMP01 B 18-Sep-2018	COMP01 C 18-Sep-2018	COMP01 D 18-Sep-2018	COMP02 A 18-Sep-2018
	Lab Number:	2051217.1	2051217.2	2051217.3	2051217.4	2051217.5
Individual Tests						
Total Recoverable Copper	mg/kg dry wt	-	-	-	-	39
Total Recoverable Lead	mg/kg dry wt	78	184	310	103	63

	Sample Name:	COMP02 B 18-Sep-2018	COMP02 C 18-Sep-2018	COMP02 D 18-Sep-2018	COMP03 A 18-Sep-2018	COMP03 B 18-Sep-2018
	Lab Number:	2051217.6	2051217.7	2051217.8	2051217.9	2051217.10
Individual Tests						
Total Recoverable Copper	mg/kg dry wt	260	113	93	91	71
Total Recoverable Lead	mg/kg dry wt	220	74	129	-	-

	Sample Name:	COMP03 C 18-Sep-2018	COMP03 D 18-Sep-2018	COMP04 A 18-Sep-2018	COMP04 B 18-Sep-2018	COMP04 C 18-Sep-2018
	Lab Number:	2051217.11	2051217.12	2051217.13	2051217.14	2051217.15
Individual Tests						
Total Recoverable Copper	mg/kg dry wt	89	91	83	106	76

	Sample Name:	COMP04 D 18-Sep-2018	COMP05 A 18-Sep-2018	COMP05 B 18-Sep-2018	COMP05 C 18-Sep-2018	COMP05 D 18-Sep-2018
	Lab Number:	2051217.16	2051217.17	2051217.18	2051217.19	2051217.20
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	-	34	49	61	6
Total Recoverable Copper	mg/kg dry wt	84	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	105	75	44	63

	Sample Name:	COMP06 A 18-Sep-2018	COMP06 B 18-Sep-2018	COMP06 C 18-Sep-2018	COMP06 D 18-Sep-2018	COMP07 A 18-Sep-2018
	Lab Number:	2051217.21	2051217.22	2051217.23	2051217.24	2051217.25
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	24	26	5	17	6

	Sample Name:	COMP07 B 18-Sep-2018	COMP07 C 18-Sep-2018	COMP07 D 18-Sep-2018	COMP10 A 18-Sep-2018	COMP10 B 18-Sep-2018
	Lab Number:	2051217.26	2051217.27	2051217.28	2051217.37	2051217.38
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	22	7	16	5	66

	Sample Name:	COMP10 C 18-Sep-2018	COMP10 D 18-Sep-2018	COMP13 A 18-Sep-2018	COMP13 B 18-Sep-2018	COMP13 C 18-Sep-2018
	Lab Number:	2051217.39	2051217.40	2051217.49	2051217.50	2051217.51
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	12	4	4	6	7

Sample Type: Soil						
	Sample Name:	COMP13 D 18-Sep-2018	PB01 17-Sep-2018	PB02 17-Sep-2018	PB03 17-Sep-2018	PB04 17-Sep-2018
	Lab Number:	2051217.52	2051217.221	2051217.222	2051217.223	2051217.224
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	46	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	360	270	660	350

	Sample Name:	PB05 17-Sep-2018	PB06 17-Sep-2018	PB07 17-Sep-2018	PB08 17-Sep-2018	PB09 17-Sep-2018
	Lab Number:	2051217.225	2051217.226	2051217.227	2051217.228	2051217.229
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	380	128	630	137	28

	Sample Name:	PB10 17-Sep-2018	PB11 17-Sep-2018	QC01 18-Sep-2018	QC02 18-Sep-2018	QC01 Dup 18-Sep-2018
	Lab Number:	2051217.230	2051217.231	2051217.232	2051217.233	2051217.234
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	60	58	54
Total Recoverable Arsenic	mg/kg dry wt	-	-	3	3	3
Total Recoverable Copper	mg/kg dry wt	-	-	33	38	33
Total Recoverable Lead	mg/kg dry wt	31	80	15.9	21	15.7
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
alpha-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
beta-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
delta-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
cis-Chlordane	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
trans-Chlordane	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	-	-	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
4,4'-DDD	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
2,4'-DDE	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
4,4'-DDE	mg/kg dry wt	-	-	0.051	0.093	0.069
2,4'-DDT	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
4,4'-DDT	mg/kg dry wt	-	-	0.044	0.097	0.062
Total DDT Isomers	mg/kg dry wt	-	-	< 0.10	0.19	0.13
Dieldrin	mg/kg dry wt	-	-	0.066	0.126	0.088
Endosulfan I	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Endosulfan II	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Endrin	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Endrin aldehyde	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Endrin ketone	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Heptachlor	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018
Methoxychlor	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.018

	Sample Name:	QC02 Dup 18-Sep-2018	Composite of COMP01 A, COMP01 B, COMP01 C & COMP01 D	Composite of COMP02 A, COMP02 B, COMP02 C & COMP02 D	Composite of COMP03 A, COMP03 B, COMP03 C & COMP03 D	Composite of COMP04 A, COMP04 B, COMP04 C & COMP04 D
	Lab Number:	2051217.235	2051217.236	2051217.237	2051217.238	2051217.239
Individual Tests						
Dry Matter	g/100g as rcvd	58	58	55	57	56
Total Recoverable Arsenic	mg/kg dry wt	4	6	9	5	4
Total Recoverable Copper	mg/kg dry wt	41	69	137	84	88
Total Recoverable Lead	mg/kg dry wt	22	163	123	37	18.5

Sample Type: Soil						
Sample Name:		QC02 Dup 18-Sep-2018	Composite of COMP01 A, COMP01 B, COMP01 C & COMP01 D	Composite of COMP02 A, COMP02 B, COMP02 C & COMP02 D	Composite of COMP03 A, COMP03 B, COMP03 C & COMP03 D	Composite of COMP04 A, COMP04 B, COMP04 C & COMP04 D
Lab Number:		2051217.235	2051217.236	2051217.237	2051217.238	2051217.239
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
alpha-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
beta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
delta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
gamma-BHC (Lindane)	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
cis-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
trans-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
4,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
2,4'-DDE	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
4,4'-DDE	mg/kg dry wt	0.075	< 0.017	< 0.018	0.079	0.057
2,4'-DDT	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
4,4'-DDT	mg/kg dry wt	0.078	< 0.017	< 0.018	0.054	0.035
Total DDT Isomers	mg/kg dry wt	0.15	< 0.10	< 0.11	0.13	< 0.11
Dieldrin	mg/kg dry wt	0.099	0.079	< 0.018	0.073	0.101
Endosulfan I	mg/kg dry wt	< 0.017	0.028	< 0.018	< 0.018	< 0.018
Endosulfan II	mg/kg dry wt	< 0.017	0.057	< 0.018	< 0.018	< 0.018
Endosulfan sulphate	mg/kg dry wt	< 0.017	0.113	< 0.018	< 0.018	< 0.018
Endrin	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Endrin aldehyde	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Endrin ketone	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Heptachlor	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Heptachlor epoxide	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Hexachlorobenzene	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018
Methoxychlor	mg/kg dry wt	< 0.017	< 0.017	< 0.018	< 0.018	< 0.018

Sample Name:		Composite of COMP05 A, COMP05 B, COMP05 C & COMP05 D	Composite of COMP06 A, COMP06 B, COMP06 C & COMP06 D	Composite of COMP07 A, COMP07 B, COMP07 C & COMP07 D	Composite of COMP08 A, COMP08 B, COMP08 C & COMP08 D	Composite of COMP09 A, COMP09 B, COMP09 C & COMP09 D
Lab Number:		2051217.240	2051217.241	2051217.242	2051217.243	2051217.244
Individual Tests						
Dry Matter	g/100g as rcvd	54	54	52	47	48
Total Recoverable Arsenic	mg/kg dry wt	22	14	13	4	5
Total Recoverable Copper	mg/kg dry wt	74	41	59	59	53
Total Recoverable Lead	mg/kg dry wt	94	17.8	16.4	15.7	19.1
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
alpha-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
beta-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
delta-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
gamma-BHC (Lindane)	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
cis-Chlordane	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
trans-Chlordane	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.05	< 0.05
2,4'-DDD	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
4,4'-DDD	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
2,4'-DDE	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
4,4'-DDE	mg/kg dry wt	0.092	< 0.018	< 0.019	< 0.03	< 0.03
2,4'-DDT	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
4,4'-DDT	mg/kg dry wt	0.089	< 0.018	< 0.019	< 0.03	0.02

Sample Type: Soil						
Sample Name:		Composite of COMP05 A, COMP05 B, COMP05 C & COMP05 D	Composite of COMP06 A, COMP06 B, COMP06 C & COMP06 D	Composite of COMP07 A, COMP07 B, COMP07 C & COMP07 D	Composite of COMP08 A, COMP08 B, COMP08 C & COMP08 D	Composite of COMP09 A, COMP09 B, COMP09 C & COMP09 D
Lab Number:		2051217.240	2051217.241	2051217.242	2051217.243	2051217.244
Organochlorine Pesticides Screening in Soil						
Total DDT Isomers	mg/kg dry wt	0.18	< 0.11	< 0.12	< 0.13	< 0.13
Dieldrin	mg/kg dry wt	0.084	< 0.018	0.040	0.05	0.04
Endosulfan I	mg/kg dry wt	0.022	< 0.018	< 0.019	< 0.03	< 0.03
Endosulfan II	mg/kg dry wt	0.042	< 0.018	< 0.019	< 0.03	< 0.03
Endosulfan sulphate	mg/kg dry wt	0.64	< 0.018	< 0.019	< 0.03	0.02
Endrin	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Endrin aldehyde	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Endrin ketone	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Heptachlor	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Heptachlor epoxide	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Hexachlorobenzene	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03
Methoxychlor	mg/kg dry wt	< 0.018	< 0.018	< 0.019	< 0.03	< 0.03

Sample Name:		Composite of COMP10 A, COMP10 B, COMP10 C & COMP10 D	Composite of COMP11 A, COMP11 B, COMP11 C & COMP11 D	Composite of COMP12 A, COMP12 B, COMP12 C & COMP12 D	Composite of COMP13 A, COMP13 B, COMP13 C & COMP13 D	Composite of COMP14 A, COMP14 B, COMP14 C & COMP14 D
Lab Number:		2051217.245	2051217.246	2051217.247	2051217.248	2051217.249
Individual Tests						
Dry Matter	g/100g as rcvd	51	53	51	51	51
Total Recoverable Arsenic	mg/kg dry wt	20	5	4	13	5
Total Recoverable Copper	mg/kg dry wt	55	56	55	62	65
Total Recoverable Lead	mg/kg dry wt	20	17.7	18.4	18.6	19.6
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
alpha-BHC	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
beta-BHC	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
delta-BHC	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
gamma-BHC (Lindane)	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
cis-Chlordane	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
trans-Chlordane	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
4,4'-DDD	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
2,4'-DDE	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
4,4'-DDE	mg/kg dry wt	< 0.019	0.021	0.03	0.088	0.07
2,4'-DDT	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
4,4'-DDT	mg/kg dry wt	0.020	0.020	0.03	0.112	0.08
Total DDT Isomers	mg/kg dry wt	< 0.12	< 0.12	< 0.12	0.20	0.15
Dieldrin	mg/kg dry wt	0.021	0.042	0.06	0.25	0.31
Endosulfan I	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Endosulfan II	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Endosulfan sulphate	mg/kg dry wt	0.023	< 0.019	< 0.02	0.026	0.03
Endrin	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Endrin aldehyde	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Endrin ketone	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Heptachlor	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Heptachlor epoxide	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Hexachlorobenzene	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02
Methoxychlor	mg/kg dry wt	< 0.019	< 0.019	< 0.02	< 0.019	< 0.02

Sample Type: Soil						
Sample Name:		Composite of COMP15 A, COMP15 B, COMP15 C & COMP15 D	Composite of COMP16 A, COMP16 B, COMP16 C & COMP16 D	Composite of COMP17 A, COMP17 B, COMP17 C & COMP17 D	Composite of COMP18 A, COMP18 B, COMP18 C & COMP18 D	Composite of COMP19 A, COMP19 B, COMP19 C & COMP19 D
Lab Number:		2051217.250	2051217.251	2051217.252	2051217.253	2051217.254
Individual Tests						
Dry Matter	g/100g as rcvd	53	61	61	61	54
Total Recoverable Arsenic	mg/kg dry wt	6	4	4	3	4
Total Recoverable Copper	mg/kg dry wt	53	35	35	32	47
Total Recoverable Lead	mg/kg dry wt	21	18.9	20	17.8	16.2
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
alpha-BHC	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
beta-BHC	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
delta-BHC	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
gamma-BHC (Lindane)	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
cis-Chlordane	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
trans-Chlordane	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
4,4'-DDD	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
2,4'-DDE	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
4,4'-DDE	mg/kg dry wt	0.031	0.030	0.044	0.054	0.055
2,4'-DDT	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
4,4'-DDT	mg/kg dry wt	0.034	0.027	0.042	0.056	0.065
Total DDT Isomers	mg/kg dry wt	< 0.12	< 0.10	< 0.10	0.11	0.12
Dieldrin	mg/kg dry wt	0.067	0.029	0.054	0.063	0.122
Endosulfan I	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Endosulfan II	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Endosulfan sulphate	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Endrin	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Endrin aldehyde	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Endrin ketone	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Heptachlor	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Heptachlor epoxide	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Hexachlorobenzene	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019
Methoxychlor	mg/kg dry wt	< 0.019	< 0.017	< 0.016	< 0.016	< 0.019

Sample Name:		Composite of COMP20 A, COMP20 B, COMP20 C & COMP20 D	Composite of COMP21 A, COMP21 B, COMP21 C & COMP21 D	Composite of COMP22 A, COMP22 B, COMP22 C & COMP22 D	Composite of COMP23 A, COMP23 B, COMP23 C & COMP23 D	Composite of COMP24 A, COMP24 B, COMP24 C & COMP24 D
Lab Number:		2051217.255	2051217.256	2051217.257	2051217.258	2051217.259
Individual Tests						
Dry Matter	g/100g as rcvd	56	55	56	60	59
Total Recoverable Arsenic	mg/kg dry wt	9	3	3	3	3
Total Recoverable Copper	mg/kg dry wt	53	29	33	27	27
Total Recoverable Lead	mg/kg dry wt	16.1	16.0	15.5	16.5	15.5
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
alpha-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
beta-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
delta-BHC	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
gamma-BHC (Lindane)	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
cis-Chlordane	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
trans-Chlordane	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017

Sample Type: Soil						
Sample Name:		Composite of COMP20 A, COMP20 B, COMP20 C & COMP20 D	Composite of COMP21 A, COMP21 B, COMP21 C & COMP21 D	Composite of COMP22 A, COMP22 B, COMP22 C & COMP22 D	Composite of COMP23 A, COMP23 B, COMP23 C & COMP23 D	Composite of COMP24 A, COMP24 B, COMP24 C & COMP24 D
Lab Number:		2051217.255	2051217.256	2051217.257	2051217.258	2051217.259
Organochlorine Pesticides Screening in Soil						
4,4'-DDD	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
2,4'-DDE	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
4,4'-DDE	mg/kg dry wt	0.070	< 0.018	< 0.018	< 0.017	< 0.017
2,4'-DDT	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
4,4'-DDT	mg/kg dry wt	0.082	0.018	< 0.018	< 0.017	< 0.017
Total DDT Isomers	mg/kg dry wt	0.15	< 0.11	< 0.11	< 0.10	< 0.10
Dieldrin	mg/kg dry wt	0.113	0.038	0.029	0.053	0.073
Endosulfan I	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Endosulfan II	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Endosulfan sulphate	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Endrin	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Endrin aldehyde	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Endrin ketone	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Heptachlor	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Heptachlor epoxide	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Hexachlorobenzene	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017
Methoxychlor	mg/kg dry wt	< 0.018	< 0.018	< 0.018	< 0.017	< 0.017

Sample Name:		Composite of COMP25 A, COMP25 B, COMP25 C & COMP25 D	Composite of COMP26 A, COMP26 B, COMP26 C & COMP26 D	Composite of COMP27 A, COMP27 B, COMP27 C & COMP27 D	Composite of COMP28 A, COMP28 B, COMP28 C & COMP28 D	Composite of COMP29 A, COMP29 B, COMP29 C & COMP29 D
Lab Number:		2051217.260	2051217.261	2051217.262	2051217.263	2051217.264
Individual Tests						
Dry Matter	g/100g as rcvd	60	70	71	73	67
Total Recoverable Arsenic	mg/kg dry wt	3	4	3	3	4
Total Recoverable Copper	mg/kg dry wt	26	44	46	50	38
Total Recoverable Lead	mg/kg dry wt	16.5	16.4	16.7	20	16.2
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
alpha-BHC	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
beta-BHC	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
delta-BHC	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
gamma-BHC (Lindane)	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
cis-Chlordane	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
trans-Chlordane	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
4,4'-DDD	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
2,4'-DDE	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
4,4'-DDE	mg/kg dry wt	< 0.017	0.024	0.025	0.019	< 0.015
2,4'-DDT	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
4,4'-DDT	mg/kg dry wt	0.017	0.017	0.018	0.016	< 0.015
Total DDT Isomers	mg/kg dry wt	< 0.10	< 0.09	< 0.09	< 0.08	< 0.09
Dieldrin	mg/kg dry wt	0.087	0.086	0.124	0.091	0.045
Endosulfan I	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Endosulfan II	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Endosulfan sulphate	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Endrin	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Endrin aldehyde	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Endrin ketone	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Heptachlor	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Heptachlor epoxide	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015

Sample Type: Soil						
Sample Name:		Composite of COMP25 A, COMP25 B, COMP25 C & COMP25 D	Composite of COMP26 A, COMP26 B, COMP26 C & COMP26 D	Composite of COMP27 A, COMP27 B, COMP27 C & COMP27 D	Composite of COMP28 A, COMP28 B, COMP28 C & COMP28 D	Composite of COMP29 A, COMP29 B, COMP29 C & COMP29 D
Lab Number:		2051217.260	2051217.261	2051217.262	2051217.263	2051217.264
Organochlorine Pesticides Screening in Soil						
Hexachlorobenzene	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015
Methoxychlor	mg/kg dry wt	< 0.017	< 0.015	< 0.014	< 0.014	< 0.015

Sample Name:		Composite of COMP30 A, COMP30 B, COMP30 C & COMP30 D	Composite of COMP31 A, COMP31 B, COMP31 C & COMP31 D	Composite of COMP32 A, COMP32 B, COMP32 C & COMP32 D	Composite of COMP33 A, COMP33 B, COMP33 C & COMP33 D	Composite of COMP34 A, COMP34 B, COMP34 C & COMP34 D
Lab Number:		2051217.265	2051217.266	2051217.267	2051217.268	2051217.269
Individual Tests						
Dry Matter	g/100g as rcvd	62	61	63	61	61
Total Recoverable Arsenic	mg/kg dry wt	4	3	4	4	4
Total Recoverable Copper	mg/kg dry wt	42	42	41	40	41
Total Recoverable Lead	mg/kg dry wt	19.0	17.2	18.7	18.9	21
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
alpha-BHC	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
beta-BHC	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
delta-BHC	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
cis-Chlordane	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
trans-Chlordane	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
4,4'-DDD	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
2,4'-DDE	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
4,4'-DDE	mg/kg dry wt	0.108	0.097	0.066	0.120	0.042
2,4'-DDT	mg/kg dry wt	0.023	0.020	< 0.016	0.016	< 0.016
4,4'-DDT	mg/kg dry wt	0.096	0.096	0.062	0.096	0.040
Total DDT Isomers	mg/kg dry wt	0.23	0.21	0.13	0.23	< 0.10
Dieldrin	mg/kg dry wt	0.22	0.20	0.153	0.116	0.067
Endosulfan I	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Endosulfan II	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Endosulfan sulphate	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Endrin	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Endrin aldehyde	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Endrin ketone	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Heptachlor	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Heptachlor epoxide	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Hexachlorobenzene	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016
Methoxychlor	mg/kg dry wt	< 0.017	< 0.016	< 0.016	< 0.016	< 0.016

Sample Name:		Composite of COMP35 A, COMP35 B, COMP35 C & COMP35 D	Composite of COMP36 A, COMP36 B, COMP36 C & COMP36 D	Composite of COMP37 A, COMP37 B, COMP37 C & COMP37 D	Composite of COMP38 A, COMP38 B, COMP38 C & COMP38 D	Composite of COMP39 A, COMP39 B, COMP39 C & COMP39 D
Lab Number:		2051217.270	2051217.271	2051217.272	2051217.273	2051217.274
Individual Tests						
Dry Matter	g/100g as rcvd	59	59	61	61	61
Total Recoverable Arsenic	mg/kg dry wt	3	3	4	4	4
Total Recoverable Copper	mg/kg dry wt	43	44	40	43	40
Total Recoverable Lead	mg/kg dry wt	17.9	17.6	16.7	15.6	16.1

Sample Type: Soil						
Sample Name:		Composite of COMP35 A, COMP35 B, COMP35 C & COMP35 D	Composite of COMP36 A, COMP36 B, COMP36 C & COMP36 D	Composite of COMP37 A, COMP37 B, COMP37 C & COMP37 D	Composite of COMP38 A, COMP38 B, COMP38 C & COMP38 D	Composite of COMP39 A, COMP39 B, COMP39 C & COMP39 D
Lab Number:		2051217.270	2051217.271	2051217.272	2051217.273	2051217.274
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
alpha-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
beta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
delta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
gamma-BHC (Lindane)	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
cis-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
trans-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
4,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
2,4'-DDE	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
4,4'-DDE	mg/kg dry wt	0.036	0.021	0.025	0.016	0.021
2,4'-DDT	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
4,4'-DDT	mg/kg dry wt	0.029	0.018	0.021	< 0.016	< 0.017
Total DDT Isomers	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dieldrin	mg/kg dry wt	0.104	0.092	0.100	0.070	0.103
Endosulfan I	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Endosulfan II	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Endosulfan sulphate	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Endrin	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Endrin aldehyde	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Endrin ketone	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Heptachlor	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Heptachlor epoxide	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Hexachlorobenzene	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017
Methoxychlor	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.017

Sample Name:		Composite of COMP40 A, COMP40 B, COMP40 C & COMP40 D	Composite of COMP41 A, COMP41 B, COMP41 C & COMP41 D	Composite of COMP42 A, COMP42 B, COMP42 C & COMP42 D	Composite of COMP43 A, COMP43 B, COMP43 C & COMP43 D	Composite of COMP44 A, COMP44 B, COMP44 C & COMP44 D
Lab Number:		2051217.275	2051217.276	2051217.277	2051217.278	2051217.279
Individual Tests						
Dry Matter	g/100g as rcvd	49	59	59	61	62
Total Recoverable Arsenic	mg/kg dry wt	4	5	4	4	5
Total Recoverable Copper	mg/kg dry wt	33	43	36	30	37
Total Recoverable Lead	mg/kg dry wt	48	29	21	19.5	15.3
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
alpha-BHC	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
beta-BHC	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
delta-BHC	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
cis-Chlordane	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
trans-Chlordane	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
4,4'-DDD	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
2,4'-DDE	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
4,4'-DDE	mg/kg dry wt	0.02	< 0.017	< 0.017	< 0.016	0.070
2,4'-DDT	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	0.018
4,4'-DDT	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	0.077

Sample Type: Soil						
Sample Name:		Composite of COMP40 A, COMP40 B, COMP40 C & COMP40 D	Composite of COMP41 A, COMP41 B, COMP41 C & COMP41 D	Composite of COMP42 A, COMP42 B, COMP42 C & COMP42 D	Composite of COMP43 A, COMP43 B, COMP43 C & COMP43 D	Composite of COMP44 A, COMP44 B, COMP44 C & COMP44 D
Lab Number:		2051217.275	2051217.276	2051217.277	2051217.278	2051217.279
Organochlorine Pesticides Screening in Soil						
Total DDT Isomers	mg/kg dry wt	< 0.12	< 0.11	< 0.10	< 0.10	0.17
Dieldrin	mg/kg dry wt	< 0.02	0.035	0.048	0.027	0.141
Endosulfan I	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Endosulfan II	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Endosulfan sulphate	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Endrin	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Endrin aldehyde	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Endrin ketone	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Heptachlor	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Heptachlor epoxide	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Hexachlorobenzene	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016
Methoxychlor	mg/kg dry wt	< 0.02	< 0.017	< 0.017	< 0.016	< 0.016

Sample Name:		Composite of COMP45 A, COMP45 B, COMP45 C & COMP45 D	Composite of COMP46 A, COMP46 B, COMP46 C & COMP46 D	Composite of COMP47 A, COMP47 B, COMP47 C & COMP47 D	Composite of COMP48 A, COMP48 B, COMP48 C & COMP48 D	Composite of COMP49 A, COMP49 B, COMP49 C & COMP49 D
Lab Number:		2051217.280	2051217.281	2051217.282	2051217.283	2051217.284
Individual Tests						
Dry Matter	g/100g as rcvd	61	61	61	61	61
Total Recoverable Arsenic	mg/kg dry wt	4	4	5	4	4
Total Recoverable Copper	mg/kg dry wt	41	37	35	36	37
Total Recoverable Lead	mg/kg dry wt	15.4	16.3	16.0	16.2	16.7
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
alpha-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
beta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
delta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
gamma-BHC (Lindane)	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
cis-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
trans-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
4,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
2,4'-DDE	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
4,4'-DDE	mg/kg dry wt	0.053	0.056	0.046	0.091	0.085
2,4'-DDT	mg/kg dry wt	< 0.016	< 0.016	< 0.017	0.017	0.017
4,4'-DDT	mg/kg dry wt	0.056	0.056	0.057	0.073	0.075
Total DDT Isomers	mg/kg dry wt	0.11	0.11	0.10	0.18	0.18
Dieldrin	mg/kg dry wt	0.095	0.076	0.081	0.170	0.179
Endosulfan I	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Endosulfan II	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Endosulfan sulphate	mg/kg dry wt	< 0.016	< 0.016	< 0.017	0.022	0.018
Endrin	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Endrin aldehyde	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Endrin ketone	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Heptachlor	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Heptachlor epoxide	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Hexachlorobenzene	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017
Methoxychlor	mg/kg dry wt	< 0.016	< 0.016	< 0.017	< 0.016	< 0.017

Sample Type: Soil						
Sample Name:		Composite of COMP50 A, COMP50 B, COMP50 C & COMP50 D	Composite of COMP51 A, COMP51 B, COMP51 C & COMP51 D	Composite of COMP52 A, COMP52 B, COMP52 C & COMP52 D	Composite of COMP53 A, COMP53 B, COMP53 C & COMP53 D	Composite of COMP54 A, COMP54 B, COMP54 C & COMP54 D
Lab Number:		2051217.285	2051217.286	2051217.287	2051217.288	2051217.289
Individual Tests						
Dry Matter	g/100g as rcvd	59	60	61	62	62
Total Recoverable Arsenic	mg/kg dry wt	4	6	7	7	7
Total Recoverable Copper	mg/kg dry wt	37	33	36	35	35
Total Recoverable Lead	mg/kg dry wt	18.5	18.0	17.9	17.4	17.1
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
alpha-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
beta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
delta-BHC	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
cis-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
trans-Chlordane	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
4,4'-DDD	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
2,4'-DDE	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
4,4'-DDE	mg/kg dry wt	0.048	0.033	0.053	0.036	0.024
2,4'-DDT	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
4,4'-DDT	mg/kg dry wt	0.045	0.028	0.045	0.039	0.031
Total DDT Isomers	mg/kg dry wt	< 0.11	< 0.10	< 0.10	< 0.10	< 0.10
Dieldrin	mg/kg dry wt	0.109	0.076	0.137	0.080	0.047
Endosulfan I	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Endosulfan II	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Endosulfan sulphate	mg/kg dry wt	< 0.017	< 0.017	0.028	0.018	< 0.016
Endrin	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Endrin aldehyde	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Endrin ketone	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Heptachlor	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Heptachlor epoxide	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Hexachlorobenzene	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016
Methoxychlor	mg/kg dry wt	< 0.017	< 0.017	< 0.017	< 0.016	< 0.016

Sample Name:		Composite of COMP55 A, COMP55 B, COMP55 C & COMP55 D	QC03 18-Sep-2018	QC03 DUP 18-Sep-2018	HA01 0.3 m 19-Sep-2018	HA02 0.4 m 19-Sep-2018
Lab Number:		2051217.290	2051217.291	2051217.292	2051217.293	2051217.294
Individual Tests						
Dry Matter	g/100g as rcvd	64	61	61	57	42
Total Recoverable Arsenic	mg/kg dry wt	7	5	5	-	-
Total Recoverable Copper	mg/kg dry wt	39	35	35	-	-
Total Recoverable Lead	mg/kg dry wt	19.7	15.1	15.0	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	10	4
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	0.27	0.23
Total Recoverable Chromium	mg/kg dry wt	-	-	-	12	13
Total Recoverable Copper	mg/kg dry wt	-	-	-	62	38
Total Recoverable Lead	mg/kg dry wt	-	-	-	84	37
Total Recoverable Nickel	mg/kg dry wt	-	-	-	3	5
Total Recoverable Zinc	mg/kg dry wt	-	-	-	138	52

Sample Type: Soil						
Sample Name:		Composite of COMP55 A, COMP55 B, COMP55 C & COMP55 D	QC03 18-Sep-2018	QC03 DUP 18-Sep-2018	HA01 0.3 m 19-Sep-2018	HA02 0.4 m 19-Sep-2018
Lab Number:		2051217.290	2051217.291	2051217.292	2051217.293	2051217.294
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
alpha-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
beta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
delta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
gamma-BHC (Lindane)	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
cis-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
trans-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.05
2,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
4,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
2,4'-DDE	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
4,4'-DDE	mg/kg dry wt	0.023	0.021	0.046	< 0.017	< 0.03
2,4'-DDT	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
4,4'-DDT	mg/kg dry wt	0.028	0.023	0.053	< 0.017	< 0.03
Total DDT Isomers	mg/kg dry wt	< 0.10	< 0.10	0.10	< 0.11	< 0.15
Dieldrin	mg/kg dry wt	0.058	0.026	0.056	< 0.017	< 0.03
Endosulfan I	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Endosulfan II	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Endosulfan sulphate	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Endrin	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Endrin aldehyde	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Endrin ketone	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Heptachlor	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Heptachlor epoxide	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Hexachlorobenzene	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Methoxychlor	mg/kg dry wt	< 0.016	< 0.016	< 0.016	< 0.017	< 0.03
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
2-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Perylene	mg/kg dry wt	-	-	-	0.018	< 0.03
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	-	-	-	0.13	< 0.06
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	-	-	-	0.13	< 0.06
Acenaphthylene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Acenaphthene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Anthracene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Benzo[a]anthracene	mg/kg dry wt	-	-	-	0.060	0.02
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	0.085	0.04
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	0.095	0.05
Benzo[e]pyrene	mg/kg dry wt	-	-	-	0.055	0.03
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	0.070	0.03
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	0.036	< 0.03
Chrysene	mg/kg dry wt	-	-	-	0.057	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Fluoranthene	mg/kg dry wt	-	-	-	0.123	0.05
Fluorene	mg/kg dry wt	-	-	-	< 0.017	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	0.069	0.03
Naphthalene	mg/kg dry wt	-	-	-	< 0.09	< 0.12
Phenanthrene	mg/kg dry wt	-	-	-	0.027	< 0.03
Pyrene	mg/kg dry wt	-	-	-	0.105	0.04
Total of Reported PAHs in Soil*	mg/kg	-	-	-	0.8	< 0.6

Sample Type: Soil						
Sample Name:		Composite of COMP55 A, COMP55 B, COMP55 C & COMP55 D	QC03 18-Sep-2018	QC03 DUP 18-Sep-2018	HA01 0.3 m 19-Sep-2018	HA02 0.4 m 19-Sep-2018
Lab Number:		2051217.290	2051217.291	2051217.292	2051217.293	2051217.294
Sample Name:		DS01 17-Sep-2018	BP01 17-Sep-2018	HB01 17-Sep-2018	HB06 17-Sep-2018	HB07 17-Sep-2018
Lab Number:		2051217.295	2051217.296	2051217.297	2051217.298	2051217.299
Individual Tests						
Dry Matter	g/100g as rcvd	48	61	-	-	-
Total Recoverable Arsenic	mg/kg dry wt	4	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	470	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	69	-	22	58	85
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	4	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	-	0.26	-	-	-
Total Recoverable Chromium	mg/kg dry wt	-	6	-	-	-
Total Recoverable Copper	mg/kg dry wt	-	10	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	14.7	-	-	-
Total Recoverable Nickel	mg/kg dry wt	-	3	-	-	-
Total Recoverable Zinc	mg/kg dry wt	-	15	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.03	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.03	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.03	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.03	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.03	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.03	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.03	-	-	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.05	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.03	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDE	mg/kg dry wt	0.02	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDT	mg/kg dry wt	0.02	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.13	-	-	-	-
Dieldrin	mg/kg dry wt	0.03	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.03	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.03	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	0.03	-	-	-	-
Endrin	mg/kg dry wt	< 0.03	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.03	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.03	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.03	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.03	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.03	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.03	-	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	-	< 0.016	-	-	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.016	-	-	-
Perylene	mg/kg dry wt	-	< 0.016	-	-	-
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	-	-	-
Acenaphthylene	mg/kg dry wt	-	< 0.016	-	-	-
Acenaphthene	mg/kg dry wt	-	< 0.016	-	-	-

Sample Type: Soil						
Sample Name:		DS01 17-Sep-2018	BP01 17-Sep-2018	HB01 17-Sep-2018	HB06 17-Sep-2018	HB07 17-Sep-2018
Lab Number:		2051217.295	2051217.296	2051217.297	2051217.298	2051217.299
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Anthracene	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[a]anthracene	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[e]pyrene	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.016	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.016	-	-	-
Chrysene	mg/kg dry wt	-	< 0.016	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.016	-	-	-
Fluoranthene	mg/kg dry wt	-	< 0.016	-	-	-
Fluorene	mg/kg dry wt	-	< 0.016	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.016	-	-	-
Naphthalene	mg/kg dry wt	-	< 0.08	-	-	-
Phenanthrene	mg/kg dry wt	-	< 0.016	-	-	-
Pyrene	mg/kg dry wt	-	< 0.016	-	-	-
Total of Reported PAHs in Soil*	mg/kg	-	< 0.4	-	-	-

Sample Name:		HB09 17-Sep-2018	HB02 17-Sep-2018	HB03 18-Sep-2018	HB04 A 19-Sep-2018	HB04 B 19-Sep-2018
Lab Number:		2051217.300	2051217.301	2051217.302	2051217.303	2051217.304
Individual Tests						
Dry Matter	g/100g as rcvd	-	64	61	65	61
TCLP Weight of Sample Taken	g	100	-	-	-	-
TCLP Initial Sample pH	pH Units	6.2	-	-	-	-
TCLP Acid Adjusted Sample pH	pH Units	1.7	-	-	-	-
TCLP Extractant Type*		NaOH/Acetic acid at pH 4.93 +/- 0.05	-	-	-	-
TCLP Extraction Fluid pH	pH Units	5.0	-	-	-	-
TCLP Post Extraction Sample pH	pH Units	4.9	-	-	-	-
Total Recoverable Arsenic	mg/kg dry wt	-	4	4	3	3
Total Recoverable Copper	mg/kg dry wt	-	37	38	47	50
Total Recoverable Lead	mg/kg dry wt	820	17.5	22	19.8	18.8
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
alpha-BHC	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
beta-BHC	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
delta-BHC	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
cis-Chlordane	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
trans-Chlordane	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
4,4'-DDD	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
2,4'-DDE	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
4,4'-DDE	mg/kg dry wt	-	0.119	< 0.017	0.023	0.027
2,4'-DDT	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
4,4'-DDT	mg/kg dry wt	-	0.21	< 0.017	0.024	0.023
Total DDT Isomers	mg/kg dry wt	-	0.33	< 0.10	< 0.09	< 0.10
Dieldrin	mg/kg dry wt	-	0.122	0.028	0.106	0.085
Endosulfan I	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Endosulfan II	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Endosulfan sulphate	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Endrin	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Endrin aldehyde	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Endrin ketone	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017

Sample Type: Soil						
Sample Name:		HB09 17-Sep-2018	HB02 17-Sep-2018	HB03 18-Sep-2018	HB04 A 19-Sep-2018	HB04 B 19-Sep-2018
Lab Number:		2051217.300	2051217.301	2051217.302	2051217.303	2051217.304
Organochlorine Pesticides Screening in Soil						
Heptachlor	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Heptachlor epoxide	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Hexachlorobenzene	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017
Methoxychlor	mg/kg dry wt	-	< 0.016	< 0.017	< 0.015	< 0.017

Sample Name:		HB05 A 19-Sep-2018	HB05 B 19-Sep-2018	HB08 17-Sep-2018		
Lab Number:		2051217.305	2051217.306	2051217.307		
Individual Tests						
Dry Matter	g/100g as rcvd	46	60	54	-	-
Total Recoverable Arsenic	mg/kg dry wt	5	12	11	-	-
Total Recoverable Copper	mg/kg dry wt	58	34	310	-	-
Total Recoverable Lead	mg/kg dry wt	22	23	178	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
alpha-BHC	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
beta-BHC	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
delta-BHC	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
cis-Chlordane	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
trans-Chlordane	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.05	< 0.04	< 0.04	-	-
2,4'-DDD	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
4,4'-DDD	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
2,4'-DDE	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
4,4'-DDE	mg/kg dry wt	0.03	0.048	< 0.019	-	-
2,4'-DDT	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
4,4'-DDT	mg/kg dry wt	0.02	0.053	< 0.019	-	-
Total DDT Isomers	mg/kg dry wt	< 0.13	0.10	< 0.12	-	-
Dieldrin	mg/kg dry wt	< 0.03	0.044	0.020	-	-
Endosulfan I	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Endosulfan II	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.03	0.017	< 0.019	-	-
Endrin	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Endrin aldehyde	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Endrin ketone	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Heptachlor	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-
Methoxychlor	mg/kg dry wt	< 0.03	< 0.016	< 0.019	-	-

Sample Type: Aqueous						
Sample Name:		HB09 [TCLP extract]				
Lab Number:		2051217.308				
Individual Tests						
Total Lead	g/m^3	0.25	-	-	-	-

Analyst's Comments

Amended Report: This certificate of analysis replaces an earlier certificate issued on 27 Sep 2018 at 1:08 pm
Reason for amendment: Testing has been added to 36 individual samples and TCLP to sample 2051217.300.

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 clean 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.
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			
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-28, 37-40, 49-52, 221-292, 295, 297-307
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	232-296, 301-307
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-28, 37-40, 49-52, 221-292, 295, 297-307
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-220
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	17-28, 37-40, 49-52, 232-292, 295, 301-307
Total Recoverable Copper	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	5-16, 232-292, 295, 301-307
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-8, 17-20, 221-292, 295, 297-307
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from Benz(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 + Chrysene x 0.01 + Dibenz(a,h)anthracene x 1 + 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	293-294, 296
Benzo[a]pyrene Toxic Equivalence (TEF)	BaP Toxic Equivalence calculated from Benzo(a)anthracene x 0.1 + BaP x 1 + Benzo(b)fluoranthene x 0.1 + Benzo(k) fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.1 + 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	293-294, 296
Total of Reported PAHs in Soil*	Sonication extraction, SPE cleanup, GC-MS SIM analysis.	0.3 mg/kg	293-294, 296
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	293-294, 296
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082). Tested on as recieved sample	0.010 - 0.06 mg/kg dry wt	232-295, 301-307
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	-	293-294, 296
TCLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311	-	300
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	300
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	300
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	300
TCLP Extractant Type*	US EPA 1311.	-	300

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	300
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	300

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Total Digestion of Extracted Samples*	Nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-	308
Total Lead	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B 22nd ed. 2012.	0.0021 g/m^3	308

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2052575	A2Pv1
Contact:	David O'Reilly	**Date Received:**	21-Sep-2018	
	C/- Focus Environmental Services Limited	**Date Reported:**	21-Sep-2018	
	PO Box 11455	**Quote No:**	73518	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1139.001	
		Add. Client Ref:	Sampled on: 17.9.18	
		Submitted By:	Shane Dolan	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence
PACM01	2052575.1	Fibre Cement	58.77	Chrysotile (White Asbestos) detected.

Analyst's Comments

Appendix No.1 - Chain of Custody

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 clean 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.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 72 Grafton Road, Auckland.	-	1
Sample Weight on receipt	Sample weight. Analysed at Hill Laboratories - Asbestos; 72 Grafton Road, Auckland.	0.01 g	1
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 72 Grafton Road, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Keith Benson HNC Chem
Laboratory Technician - Asbestos

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2053202 A2Pv1
Contact:	David O'Reilly	**Date Received:**	24-Sep-2018
	C/- Focus Environmental Services Limited	**Date Reported:**	27-Sep-2018
	PO Box 11455	**Quote No:**	73518
	Ellerslie	**Order No:**	
	Auckland 1542	**Client Reference:**	1139.001
		Submitted By:	Shane Dolan

Sample Type: Soil

Sample Name:		HB01 17-Sep-2018	HB02 17-Sep-2018	HB03 17-Sep-2018	HB04 17-Sep-2018	HB05 17-Sep-2018
Lab Number:		2053202.1	2053202.2	2053202.3	2053202.4	2053202.5
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	464.7	618.9	533.2	643.9	511.2
Dry Weight	g	204.1	395.4	311.2	416.5	254.1
Ashed Weight	g	141.2	348.6	245.2	355.5	176.8
Moisture	%	56	36	42	35	50
Dry Sample Fraction >10mm	g ashed wt	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sample Fraction <10mm to >2mm	g ashed wt	0.2	< 0.1	0.2	< 0.1	3.8
Sample Fraction <2mm	g ashed wt	140.3	347.2	244.1	353.8	172.4
<2mm Subsample Weight	g ashed wt	54.1	54.4	54.4	58.7	55.3
Weight of Asbestos in ACM (Non-Friable)	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		HB06 17-Sep-2018	HB07 17-Sep-2018	HB08 17-Sep-2018	HB09 17-Sep-2018	ASB01 17-Sep-2018
Lab Number:		2053202.6	2053202.7	2053202.8	2053202.9	2053202.10
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Chrysotile (White Asbestos) detected.
Description of Asbestos Form		-	-	-	-	ACM Debris
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	477.0	525.2	483.5	535.0	439.4
Dry Weight	g	218.5	282.4	253.7	317.2	312.9
Ashed Weight	g	150.5	232.9	195.3	271.1	264.5
Moisture	%	54	46	48	41	29

Sample Type: Soil						
	Sample Name:	HB06 17-Sep-2018	HB07 17-Sep-2018	HB08 17-Sep-2018	HB09 17-Sep-2018	ASB01 17-Sep-2018
	Lab Number:	2053202.6	2053202.7	2053202.8	2053202.9	2053202.10
Dry Sample Fraction >10mm	g ashed wt	< 0.1	< 0.1	< 0.1	3.4	< 0.1
Sample Fraction <10mm to >2mm	g ashed wt	< 0.1	0.6	9.7	17.7	1.3
Sample Fraction <2mm	g ashed wt	150.0	231.6	185.2	249.0	262.8
<2mm Subsample Weight	g ashed wt	52.9	52.5	53.8	58.2	51.3
Weight of Asbestos in ACM (Non-Friable)	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g ashed wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00399

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 clean 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.
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; 101c Waterloo Road, Christchurch.	0.1 g	1-10
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-10
Ashed Weight	Sample ashed at 400°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-10
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	1 %	1-10
Sample Fraction >10mm	Sample ashed at 400°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g ashed wt	1-10
Sample Fraction <10mm and >2mm	Sample ashed at 400°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g ashed wt	1-10
Sample Fraction <2mm	Sample ashed at 400°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g ashed wt	1-10
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.	-	1-10
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-10
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 ashed wt	1-10
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	1-10
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 ashed wt	1-10

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
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	1-10
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 ashed wt	1-10
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	1-10
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	1-10

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Rhodri Williams BSc (Hons)
Section Manager - Asbestos