



Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

Prepared by:

SLR Consulting NZ

Level 2, 214 Collingwood Street, Hamilton 3024,
New Zealand

SLR Project No.: 880.016550.00001

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	22 July 2024	Oliver Tate	Lucie Kibblewhite	Nigel Mather
2.0	28 May 2025	Olivia Mollentze	Nigel Mather	

Basis of Report

This report has been prepared by SLR Consulting NZ (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Matamata Development Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



Executive Summary

SLR Consulting New Zealand Ltd (SLR) was engaged by Matamata Development Limited to undertake a combined Preliminary Site Investigation and Detailed Site Investigation (PSI/DSI) across eight land parcels (Part Lot 1 DP 21055, Lot 1 DPS 65481, Lot 2 DP 21055, Lot 2 DP 567678, Lot 3 DPS 14362, Lot 4 DP 384886, Lot 5 DP 384886 and Lot 204 DP 535395) in Matamata (collectively 'the Site').

The purpose of the PSI/DSI is to determine any potential activities listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) that are being, have been, or are likely to have been conducted at the Site, to understand the nature and extent of soil contamination arising from historical uses of the Site (if any), and to assess potential implications for proposed activities and associated soil disturbance under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE, 2011) and the Waikato Regional Plan (WRP). The key findings are:

- A review of historical aerial photographs indicated agricultural operations were in operation at the Site in the earliest available image (1943);
- A residential dwelling and associated farm buildings have been present in the west of the Site since 1943 (earliest available image);
- Following the desk based review, the following HAIL activities were identified as having potentially occurred at selected locations on the Site:
 - A10: *Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds* – associated with the accumulation of organochlorine pesticides from the repeated use of pesticides across the areas of land used for cropping;
 - E1: *Asbestos products manufacture or disposal, including sites with buildings known to be in a deteriorated condition* – given the age of the former building at the Site, there is the potential that asbestos-containing products had been used, therefore there is the potential that asbestos has impacted soil around the building;
 - G3: *Landfill sites* – associated with uncontrolled fill of historic surface depressions; and
 - I: *Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment* – associated with:
 - Lead in shallow soils around the existing buildings and at locations where former buildings have been removed; and
 - Accumulation of cadmium and zinc in soils from the repeated application of superphosphate across pastoral land.
- The site investigation included collection of soil samples from 52 locations across the Site;
- The analytical results of soil sampling targeted to address the above potential HAIL activities identified:
 - Asbestos was not detected in any analysed samples;



- Concentrations of all heavy metals analysed were below the respective NESCS Soil Contaminant Standards (SCS) for residential (10% produce) and below the Ecological Soil Guideline Values (Eco-SGVs);
- Polycyclic Aromatic Hydrocarbons (PAHs) were not detected above the laboratory limit of reporting (LLOR) for all samples analysed; and
- Organochlorine pesticides (OCPs) were detected in four samples, however concentrations were reported below the NESCS SCS and Eco-SGVs.
- The Site is considered to be a 'piece of land' under the Regulation 5(7) of the NESCS as HAIL A10 is considered more likely than not to have occurred at the Site, confirmed via the presence of OCPs in selected soil samples. Heavy metal concentrations in soil samples were above the predicted background soil concentrations, but below NESCS SCS concentrations. Therefore, a controlled consent under Regulation 9(3) of the NESCS is required to undertake the change of land use and for future soil disturbance as part of future developments; and
- The Site does not meet the definition of Contaminated Land under the WRCRP and therefore the rules do not apply.

This investigation and associated reporting have been carried out and reviewed by a Suitably Qualified and Experienced Practitioner (SQEP) in accordance with the requirements of the NESCS.



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Acronyms and Abbreviations

ACM	Asbestos Containing Material
CAT	Cable Avoidance Tool
CLMG	Contaminated Land Management Guidelines
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
GAMAS	Guidelines for Assessing and Managing Asbestos in Soil
GPR	Ground Penetrating Radar
HAIL	Hazardous Activities and Industries List
LOR	Limit of Reporting
LUIR	Land Use Information Register
MPDC	Matamata Piako District Council
MfE	Ministry for the Environment
m bgl	metres below ground level
NES-CS	National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health
PAH	Polycyclic Aromatic Hydrocarbons
PSI	Preliminary Site Investigation
SCS	Soil Contaminant Standards
SOP	Standard Operating Procedure
SQEP	Suitably Qualified and Experienced Practitioner
WRC	Waikato Regional Council



1.0 Introduction

SLR Consulting New Zealand Ltd (SLR) was engaged by Matamata Development Limited to undertake a combined Preliminary Site Investigation and Detailed Site Investigation (PSI/DSI) across eight land parcels (Part Lot 1 DP 21055, Lot 1 DPS 65481, Lot 2 DP 21055, Lot 2 DP 567678, Lot 3 DPS 14362, Lot 4 DP 384886, Lot 5 DP 384886 and Lot 204 DP 535395) in Matamata (collectively the Site). The PSI/DSI will support a plan change under the Eldonwood South Structure Plan to 'Residential Zone'. A Site location plan is provided in Figure 1.

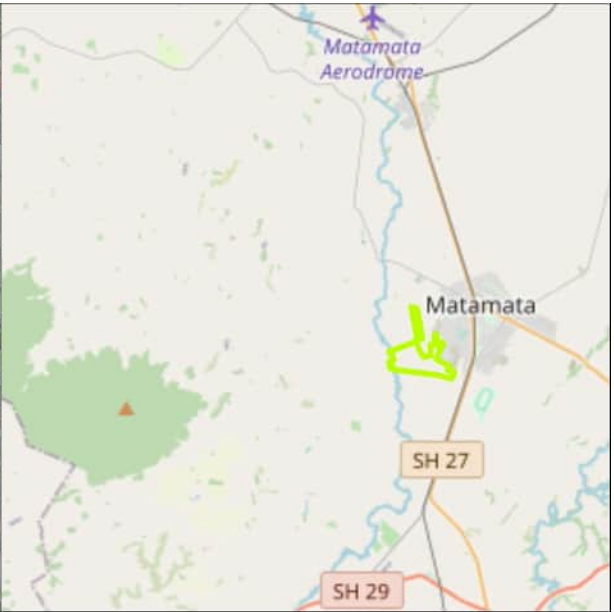
The purpose of the PSI/DSI is to determine any potential activities listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) that are being, have been, or are likely to have been conducted at the Site, to understand the nature and extent of soil contamination arising from historical uses of the Site (if any), and to assess potential implications for proposed activities and associated soil disturbance under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE, 2011) and the Waikato Regional Plan (WRP).

1.1 Scope of Works

The scope of this combined PSI and DSI included the following:

- Review of publicly available information about the site, including a review of regional and district council records and historical aerial photographs;
- Completion of a site walkover and documentation of observations;
- Collection and analysis of surface and sub-surface soil samples to assess whether soil contamination resulting from potential Hazardous Activities and Industries List (HAIL) activities identified in the PSI has occurred;
- Development of the site conceptual site model (CSM) and exposure pathway assessment (determination of source-pathway-receptor (SPR) linkages); and
- Provision of recommendations with respect to resource consent requirements and construction/earthworks at the Site.





Legend

Site Boundary

0 100 m 200 m
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by Datanest.earth

Title: Site Location Plan		
Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1
Date: 31-05-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:9658	Version: Final

2.0 Site Description

2.1 Site Description and Features

The area subject to this investigation is located across eight land parcels in Matamata. The collective area of the Site is approximately of 125.14 hectares (ha). A Site location plan is provided in Figure 1. Site details are provided in Table 1.

Table 1: Site Details

Site Locality	Eldonwood Drive and Station Road, Matamata	
Legal Descriptions	Lot 1 DP 21055	33.23 ha
	Lot 2 DP 567678	13.50 ha
	Lot 2 DP 21055	27.38 ha
	Lot 1 DP South Auckland 65481	4.20 ha
	Lot 3 DP South Auckland 14362	13.71 ha
	Lot 4 DP 384886	0.88 ha
	Lot 5 DP 384886	8.10 ha
	Lot 204 DP 535395 and Lot 25 DP 3933306	24.14 ha
Councils	District Council: Matamata-Piako District Council (MPDC) Regional Council: Waikato Regional Council (WRC)	
Surrounding Land Use	North:	General Rural Zone and residential areas within Rural Lifestyle zones to the north.
	East:	Rural Lifestyle Zone and General Residential Zone. Residential area to the east.
	South:	General Rural Zone. Rural area (fields and pasture) to the south.
	West:	General Rural Zone. Rural area (fields and pasture) to the west.
Land Use / Zoning	Eastern portion of Site: Rural Lifestyle Zone Western and northern portion of Site: Rural Zone	



2.1.1 Site Walkover Observations

SLR Environmental Consultants visited the site on 22 and 23 April, and 9 and 10 May 2024 to conduct a site walkover and collect soil samples respectively. Photographs from the site visits are provided in Appendix A. The following was noted:

- The Site was predominately flat, however sloped steeply to the Waitoa River at the western boundary;
- The paddocks were pastoral, with cows and horses present on the Site;
- Bare patches of earth were noted across the Site, predominately associated with gates and water troughs;
- Tyres, timber, vegetation and metal were stockpiled at selected locations across the Site;
- Chemicals, fertiliser and fuel are stored in the farm buildings in the west of the Site; and
- Potential asbestos-containing materials were noted on a building in the east of the Site, and on the milking shed in the west of the Site however was noted to be in fair condition.

2.1.2 Current and Proposed Land Use

The Site is located within a General Rural Zone and Rural Lifestyle Zone and is currently used for rural purposes (pasture).

It is understood that a mixed use development (residential, energy production – solar panels and commercial) is proposed to be constructed at the Site, requiring a plan change.

2.2 Environmental Features

2.2.1 Topography

The Waikato Regional Council (WRC) LiDAR 5 metre contours identifies that the Site is at approximately 60 – 70 metres above sea level datum (m asld).

The topography of the Site is predominately flat, with the Site sloping steeply on the western boundary towards the Waitoa River.

2.2.2 Geology

The Institute of Geological and Nuclear Sciences (GNS) 1:250,000 online geological map shows that the Site is underlain by Late Pleistocene River deposits (Hinuera Formation), consisting of cross-bedded pumice sand, silt, and gravel with interbedded peat.

2.2.3 Hydrology

No surface water bodies were identified on the Site. The western boundary of the Site (land parcel PT LOT 1 DP 21055) borders the Waitoa River, which flows south to north.

2.2.4 Hydrogeology

A search of Wells Aotearoa New Zealand identified six boreholes on the Site and a further six within 200 m of the Site. Details of the boreholes are presented in Table 2.

Based on the information summarised in Table 2, and the topography information summarised in Section 2.2.1, the depth to groundwater is anticipated to be greater than 5



metres below ground level (m bgl). Regional groundwater is likely to flow west towards the Waitoa River.

Table 2: Summary of Borehole Details

Borehole ID	Distance from Subject Site	Depth to base (m bgl)	Depth to groundwater (m bgl)	Use
72_3392	Onsite	214.40	-	Unknown
64_974	Onsite	8.25	-	Unknown
64_63	Onsite	-	-	Unknown
64_629	Onsite	16.0	-	Unknown
64_628	Onsite	16.0	-	Unknown
65_596	Onsite	30.0	-	Unknown
64_613	130m North	10.0	-	Unknown
72_10565	120m North West	80.0	-	Unknown
72_10566	120m North West	74.50	-	Unknown
64_102	50m North East	25.50	-	Unknown
72_5413	150m South	-	-	Unknown
72_6865	150m South West	-	-	Unknown

2.3 Site History

To understand the history of the Site, and particularly the nature and location of any potentially contaminating activities, a review of selected publicly available information for the Site was undertaken. This included searches of the following in conjunction with the completion of an inspection of the Site:

- WRC Land Use Information Register (LUIR);
- WRC and Matamata-Piako District Council (MPDC) Resource Consent database;
- Historical aerial images (available through Retrolens and Google® Earth™);
- Hazardous substances incidents reports, provided by the Environmental Protection Agency (EPA); and
- Historical reports associated with the Site.

2.3.1 Council Records

2.3.1.1 Resource Consents

A review of the WRC LocalMaps GIS Resource Consent layer did not identify any consents associated within the Site.

2.3.1.2 Listed Use Information Register (LUIR)

A review of the WRC LUIR was conducted on 19 April 2024 for the land parcels listed in Section 2.1, which confirmed the Site is not listed on the LUIR.



LUIR report 4266 relates to the property identified as 42 Jellicoe Road, Matamata (site number: LUI10840), located approximately 300 m east of the Site. LUIR report 4266 identified the following HAIL activities:

- A10: Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds;
- G3: Landfill sites; and
- I: Other land subjected to the release of a hazardous substance.

A number of investigations were completed by Civil Engineering Central Ltd in relation to 42 Jellicoe Road. These include a PSI/DSI, an additional DSI, a Remedial Action Plan and Site Validation Report. Validation samples collected were below adopted guidelines. The property associated with LUIR report 4266 is classified by WRC as 'remediated'.

A copy of the LUIRs are provided in Appendix B.

2.3.2 Previous Reports

There are no known historic reports associated with the Site.

2.3.3 Historical Aerial Photographs

Historical aerial photographs were sourced and reviewed from Retrolens and Google Earth™. These are described in Table 3 and copies of the historical aerial photographs are provided in Appendix C.

Table 3: Historical Aerial Photographs

Year	Reference	Observations
1943	Retrolens (Black and White)	Site: The Site appears to be used for agricultural, the majority of the Site is used for pastoral use. There are buildings in the west of the Site, with farm buildings scattered across the Site. Off-Site: The surrounding land is being used for agricultural purposes. Residential dwellings and/or farm buildings surrounding the Site.
1966	Retrolens (Black and White)	Site: Additional buildings have been developed in the west of the Site. Farm races have been constructed across the west of the Site. A small area of soil disturbance is noted in the south-west and south-east corners of the Site. Cropping is noted in the centre of the Site. Off-Site: There are an increased number of residential dwellings to the north-east of the Site.
1976	Retrolens (Black and White)	Site: Shelterbelts across the Site have been removed. Cropping is noted in the northeast corner of the Site. The area of soil disturbance in the south-east of the Site is no longer observed. Off-Site: Residential developments to the north-east and north of the Site continue to increase, in the current position of Matamata.



1981	Retrolens (Black and White)	Site: A farm race extends onto the northern part of the Site. Additional buildings are present in the west of the Site. A small area of soil disturbance is present in the centre of the Site. Off-Site: Matamata residential developments to the north and east of the Site continue to increase in area.
1990	Retrolens (Black and White)	Site: The small area of soil disturbance in the south-west corner of the Site is no longer visible, with the small area of soil disturbance in the centre of the Site filled with water. Cropping is noted in the south of the Site. Off-Site: Matamata residential developments continue to be established to the north and east of the Site.
2003	Google Earth™ (Colour)	Site: A residential dwelling has been developed in the northern corner of the Site. Off-Site: No significant changes from the 1990 aerial observed.
2013	Google Earth™ (Colour)	Site: No significant changes from the 2003 aerial photograph observed. Off-Site: Land immediately adjacent the eastern boundary is being developed for residential purposes. More land to the northwest of the Site is being used for cropping purposes. Buildings have been constructed to the northwest of the Site. The residential area to the northeast has expanded to the east of the Site.
2019	Google Earth™ (Colour)	Site: An effluent pond has been constructed in the west of the Site. No other significant changes from the 2013 aerial observed. Off-Site: The area around 48 Jellicoe Drive has been subject to earthworks. Residential developments area to the north and east of the Site continue to increase.

2.3.4 Site History Summary

Based on a review of publicly available information in relation to the history of the Site, the following can be summarised:

- Historical aerial imagery shows agricultural operations at the Site likely commenced prior to the 1940s and evidence of occasional cropping across the Site is visible;
- A residential dwelling and associated farm buildings have been present in the west of the Site since 1943 (earliest available image); and
- Small areas of soil disturbances have been visible across the Site, likely associated with sand extraction for farm activities (e.g. farm race construction).

2.4 HAIL Assessment

Based on the above Site history review and Site walkover, the following HAIL activities may have been undertaken at the Site:

- A10: *Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds* – associated with accumulation of



organochlorine pesticides from the repeated use of pesticides across the areas of land used for cropping;

- E1: *Asbestos products manufacture or disposal, including sites with buildings known to be in a deteriorated condition* – given the age of the former building at the Site there is the potential that asbestos containing products had been used, therefore there is the potential that asbestos has impacted soil around the building;
- G3: *Landfill sites* – associated with uncontrolled fill of historic surface depressions; and
- I: *Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment* – associated with:
 - Associated with lead in shallow soils around the existing buildings and at locations where former buildings have been removed; and
 - Accumulation of cadmium and zinc in soils from the repeated use of superphosphate across pastoral land.

Contaminants of potential concern (CoPC) associated with the above activities include:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc);
- Organochlorine pesticides (OCPs);
- Asbestos; and
- Polycyclic aromatic hydrocarbons (PAH).



3.0 Initial Conceptual Site Model

An initial Conceptual Site Model (CSM) (Table 4), based on the findings of the Site history and background information review, provides a detailed description of the identified potential sources, pathways and receptors, and a qualitative assessment of complete or potentially complete source-pathway receptor (SPR) linkages. A risk is only present if there is a complete SPR linkage. The CSM detailed in Table 4 is not intended to be an exhaustive assessment of all potential SPR linkages. The CSM has been developed based on available information, any omissions are not indicative of no risk.

Table 4: Tabulated Initial Conceptual Site Model

Activity Identified	Potential HAIL Reference	Location On Site	Potential Contaminants	Pathway	Receptor	Discussion and SPR Linkage
Farming activities including pesticides application	A10: <i>Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds</i>	Entire Site	Organochlorine Pesticides	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	<p>Potentially Complete</p> <p>Determination of whether the SPR linkage is complete requires soil sampling and analysis to assess the concentrations of contaminants in soil, and a risk assessment to determine the potential risk to human health and the environment.</p>
				Leaching to surface water	Environmental	
Historic building with potential asbestos containing materials	E1: <i>Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition</i>	Historic building footprint	Asbestos	Inhalation	Site users and maintenance/excavation workers	
Infilling of historic surface depressions/borrow pits and minor farm dumps	G5: <i>Waste Disposal to land</i>	Areas of soil disturbance	Heavy metals, Polycyclic Aromatic Hydrocarbons (PAH)	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	
				Leaching to groundwater or surface water	Environmental	
Farming activities including superphosphate use	I: <i>Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.</i>	Entire Site	Cadmium	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	
				Leaching to surface water	Environmental	
Degradation of potential lead-based paint on the residential buildings, garage and shed		Former buildings	Lead	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	
				Leaching to surface water	Environmental	



4.0 Detailed Site Investigation

SLR field staff conducted a Site inspection and shallow soil sampling on the 22 and 23 April, and 9 and 10 May 2024. This involved the collection of 32 surface soil samples from across the Site to be composited, 27 samples from eight hand augers and 19 samples from existing or historical buildings. Soil sample information and the analytical schedule is presented in Appendix D.

Sample location plans are provided in Figures 2 (composite samples), 3.1 and 3.2 (building and hand augers).

4.1 Sampling Observations

A photographic log depicting sampling observations and typical soil profile is presented in Appendix A. Soil characteristics and observations are described below:

- Surface soils were relatively uniform across the Site and consisted of dark brown sandy silts underlain by orange-brown sandy silts (Hinuera formation);
- Organic material including roots were present within surface soils;
- The target sampling depth was reached at all locations;
- No visual or olfactory evidence of soil contamination was noted at any of the sampling locations; and
- Groundwater was not encountered during soil sampling.

4.2 Sampling Methodology

The following methodology was adopted during the soil sampling works:

- A stainless-steel spade or hand auger was used to collect all soil samples;
- A clean pair of nitrile gloves were worn to collect each soil sample to limit the potential for cross-contamination;
- Soil samples were placed in laboratory provided clean sample jars and identified with a unique sample identifier, which was documented on the sample label, sample log, and chain of custody form;
- A soil sample description (included in Appendix D) was completed for each soil sample location including: a description of materials encountered, olfactory and visual evidence of contamination, and sample intervals and identifiers;
- Soil samples were placed in an ice-cooled storage box (i.e., chilly bin) immediately after collection and transported under chain of custody documentation to the analytical laboratory; and
- Field sampling equipment was decontaminated prior to use at each soil sample location to limit the potential for cross-contamination. Decontamination of field equipment involved: wash with clean potable water, scrubbing in a detergent solution (Decon 90) and potable water, and a final rinse in clean water.

The soil samples were transported under full Chain of Custody documentation to Hill Labs, Hamilton, presented in Appendix E.





Legend

- Site Boundary
- Soil Sample (Composite)

0 100 m 200 m
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by Datanest.earth

Title: Figure 2 - Composite Sampling Plan

Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 2
Date: 25-06-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:7571	Version: Final



Legend

- Soil Sample (Hand Auger)
- Soil Sample (Surface)
- Site Boundary

0 25 m 50 m
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by [Datanest.earth](#)

Title:
Building and Hand Augers Sampling Plan

Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure: 3.1
Date: 25-06-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:2414	Version: Final



Legend

- Soil Sample (Hand Auger)
- Soil Sample (Surface)
- Site Boundary

0 50 m 100 m
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by [Datanest.earth](#)

Title:
Building and Hand Augers Sampling Plan

Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure: 3.2
Date: 25-06-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:4808	Version: Final

5.0 Results

5.1 Evaluation Criteria

The soil sample results have been screened against the following criteria:

- **NESCS SCS:** National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) Soil Contaminant Standards (SCS) for a Residential 10% Produce Land Use. The Residential land use scenario is considered appropriate as a conservative assessment of risk to future site users as well as excavation and maintenance workers;
 - The NESCS SCS definition for Residential land use scenario is “Standard residential lot, for single dwelling sites with gardens, including home-ground produce consumption (10 per cent)”.
- **NEPM:** Australian National Environmental Protection Council National Environmental Protection Measures (Assessment of Site Contamination), 1999 (amendment No.1, 2013) – Schedule B(1), Health Investigation Level B (HIL-A) Standard Residential;
 - This guideline was utilised for human health criteria that are not included in the NESCS SCS;
- **NZ GAMAS:** New Zealand Guidelines for Assessing and Managing Asbestos in Soil (NZ GAMAS, November 2017), using ‘Residential’. Combined Fibrous Asbestos + Asbestos Fines and/or asbestos containing material (ACM bonded) as % of Total Sample % w/w;
- **Predicted Background Concentrations (PBC):** Natural Background Concentrations in the Waikato region (Waikato Regional Council); and
- **Eco SGV:** Manaaki Whenua Landcare Research Ecological Soil Guideline Values for the Protection of Ecological Receptors (ECO-SGVs). Prepared June 2022 (Envirolink Grant: 2214-MLDC162). Using the Residential land use category.
 - This guideline is used to assess the risk to terrestrial ecological receptors.

5.2 Analytical Results

Soil sample results are summarised in Table 5. Laboratory analytical reports and chain of custody information is provided in Appendix E. Soil analytical results can be summarised by the following:

5.2.1 Heavy Metals

- Concentrations of all heavy metals analysed were below the respective NESCS SCS for residential (10% produce) and below the respective Eco-SGV;
- Arsenic exceeded the PBC of 6.8 mg/kg in one sample, HA02_0.0-0.15;
- Cadmium exceeded the PBC of 0.22 mg/kg in 15 samples, HA02_0.0-0.15, HA03_0.0-0.15, HA04_0.0-0.15, HA05_0.0-0.15, HA06_0.0-0.15, HA07_0.0-0.15, HA08_0.0-0.15 and all eight composite samples ranging from 0.3 to 1.13 mg/kg;
- Copper exceeded the PBC of 25 mg/kg in two samples, HA02_0.0-0.15 and HA03_0.0-0.15, ranging from 38 to 57 mg/kg;



- Lead exceeded the PBC of 20 mg/kg in three samples, B7_0.0-0.15, B12_0.0-0.15 and HA02_0.0-0.15, ranging from 25 to 31 mg/kg; and
- Zinc exceed the PBC of 53 mg/kg in seven samples, HA02_0.0-0.15, HA03_0.0-0.15, HA04_0.0-0.15, HA05_0.0-0.15, HA06_0.0-0.15, HA07_0.0-0.15, HA08_0.0-0.15, ranging from 63 to 230 mg/kg.

5.2.2 Organochlorine Pesticides

- 4,4'- Dichlorodiphenyldichloroethylene (DDE), a Dichlorodiphenyltrichloroethane (DDT) isomer, was reported above the laboratory limit of reporting (LLOR) in four samples, HA06_0.0-0.15, HA07_0.0-0.15, C4 and C5 and ranging from 0.029 to 0.044 mg/kg.
- Total DDT isomer concentrations were below the LLOR and therefore below the NESCS SCS the Eco-SGV; and
- All other OCPs were not detected above the LLOR in any of the other analysed samples.

5.2.3 Polycyclic Aromatic Hydrocarbons

- PAHs were not detected above the LLOR in any analysed samples.

5.2.4 Asbestos

- Asbestos was not detected in any analysed samples.





Table C1 - Soil Analytical Results

Client Name: Unity Developments
Project: Eldonwood Preliminary and Detailed Site Investigation
Project Number: 880.016550.00001

Sample Reference	NESCO SCS - Residential 10% Produce Land-Use ¹	NZ GAMAS ²	Predicted Background Soil Concentrations ³	Eco-SGVs ⁴	B1_0.0-0.15	B2_0.0-0.15	B3_0.0-0.15	B4_0.0-0.15	B7_0.0-0.15	B8_0.0-0.15	B9_0.0-0.15	B10_0.0-0.15
Laboratory References					3556223.13	3556223.12	3556223.1	3556223.8	3577088.41	3577294.5	3577088.43	3577294.18
Sample Depth (m bgl)					3556745.11	3556745.9	3556745.7	3556745.5	3577294.16	3577088.16	3577294.3	3577088.43
Date					0.1	0.1	0.1	0.1	0.2	0.15	0.15	0.15
					23-May-24	23-Apr-24	23-Apr-24	23-Apr-24	10-May-24	9-May-24	9-May-24	10-May-24
pH (pH units)	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (semi-quantitative)												
Asbestos Presence / Absence	-	-	-	-	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
Asbestos in ACM as % of Total Sample (%w/w)	-	0.01	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined FA & AF as % Total Sample (%w/w)	-	0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Heavy Metals												
Total Recoverable Arsenic	20	-	6.8	60	-	-	-	-	-	-	-	-
Total Recoverable Cadmium	3	-	0.22	12	-	-	-	-	-	-	-	-
Total Recoverable Chromium	460	-	30	390	-	-	-	-	-	-	-	-
Total Recoverable Copper	> 10,000	-	25	240	-	-	-	-	-	-	-	-
Total Recoverable Lead	210	-	20	900	10.5	10.8	13.7	11.1	31	8.7	16.6	-
Total Recoverable Nickel	400*	-	7.6	-	-	-	-	-	-	-	-	-
Total Recoverable Zinc	8,000*	-	53	300	-	-	-	-	-	-	-	-
Organochlorine Pesticides												
2,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-
2,4'-DDE	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	-	-	-	-	-	-	-	-	-	-	-	-
2,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-
Total DDT Isomers	70	-	-	4.8	-	-	-	-	-	-	-	-
Dieldrin	2.6	-	-	-	-	-	-	-	-	-	-	-
All other OCPs	-	-	-	-	-	-	-	-	-	-	-	-
PAH - Polycyclic Aromatic Hydrocarbons												
Total of Reported PAHs in Soil	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene (BAP)	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor	10	-	-	22	-	-	-	-	-	-	-	-
Benzo[a]pyrene Toxic Equivalence	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[e]pyrene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[k]fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo[a,h]anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Perylene	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Units are mg/kg unless otherwise stated
Any results exceeding adopted criteria are shaded accordingly.
- = not analysed
m bgl = metres below ground level

1: National Environmental Standards for Managing and Assessing Contaminants in Soil to Protect Human Health¹ - Soil Contaminant Standards (SCS), (MfE, 2012) - Residential 10% produce
* Values not provided for in NESCS, National Environment Protection (Assessment of Site Contamination) Measure 2011 used
2: New Zealand Guidelines for Assessing and Managing Asbestos in Soil (GAMAS, 2017) - Residential land use.
3: Natural Background Concentrations in the Waikato Region (WRC)



Table C1 - Soil Analytical Results

Client Name: Unity Developments
Project: Eldonwood Preliminary and Detailed Site Investigation
Project Number: 880.016550.00001

Sample Reference	NESCS SCS - Residential 10% Produce Land-Use ¹	NZ GAMAS ²	Predicted Background Soil Concentrations ³	B12_0.0-0.15	HA02_0.0-0.15	HA03_0.0-0.15	HA04_0.0-0.15	HA05_0.15	HA06_0.15	HA07_0.15	HA08_0.15	C1
Laboratory References				3577088.12	3556223.4 3556745.3	3556223.3 3556745.2	3556223.1	3577088.48	3577088.19	3577088.24	3577088.29	3556223.21
Sample Depth (m bgl)				0.15	0.1	0.1	0.1	0.15	0.15	0.15	0.15	0.15
Date				10-May-2024	23-Apr-24	23-Apr-24	23-Apr-24	10-May-24	10-May-24	10-May-24	10-May-24	22-Apr-24
pH (pH units)	-	-	-	-	-	-	-	-	-	-	-	7.6
Asbestos (semi-quantitative)												
Asbestos Presence / Absence	-	-	-	-	Not detected	Not detected	-	-	-	-	-	-
Asbestos in ACM as % of Total Sample (%w/w)	-	0.01	-	-	< 0.001	< 0.001	-	-	-	-	-	-
Combined FA & AF as % Total Sample (%w/w)	-	0.001	-	-	< 0.001	< 0.001	-	-	-	-	-	-
Heavy Metals												
Total Recoverable Arsenic	20	-	6.8	-	15	6	5	4	4	5	5	-
Total Recoverable Cadmium	3	-	0.22	-	0.48	0.47	0.3	0.82	0.82	0.95	0.32	0.47
Total Recoverable Chromium	460	-	30	-	15	10	8	8	8	7	8	-
Total Recoverable Copper	> 10,000	-	25	-	57	38	20	21	24	21	14	-
Total Recoverable Lead	210	-	20	25	29	14	14.9	8.8	9.8	17.1	9.9	-
Total Recoverable Nickel	400*	-	7.6	-	11	9	4	5	5	5	5	-
Total Recoverable Zinc	8,000*	-	53	-	184	112	63	230	166	184	165	-
Organochlorine Pesticides												
2,4'-DDD	-	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
4,4'-DDD	-	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
2,4'-DDE	-	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
4,4'-DDE	-	-	-	-	-	-	-	< 0.017	0.033	0.044	< 0.014	< 0.015
2,4'-DDT	-	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
4,4'-DDT	-	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
Total DDT Isomers	70	-	-	-	-	-	-	< 0.10	< 0.10	< 0.09	< 0.09	< 0.09
Dieldrin	2.6	-	-	-	-	-	-	< 0.017	< 0.016	< 0.015	< 0.014	< 0.015
All other OCPs	-	-	-	-	-	-	-	< LOR	< LOR	< LOR	< LOR	< LOR
PAH - Polycyclic Aromatic Hydrocarbons												
Total of Reported PAHs in Soil	-	-	-	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-
1-Methylnaphthalene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
2-Methylnaphthalene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Acenaphthylene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Acenaphthene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Anthracene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[a]anthracene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[a]pyrene (BAP)	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[a]pyrene Potency Equivalency Factor	10	-	-	-	< 0.032	< 0.036	< 0.037	< 0.040	< 0.038	< 0.037	< 0.033	-
Benzo[a]pyrene Toxic Equivalence	-	-	-	-	< 0.032	< 0.035	< 0.037	< 0.040	< 0.038	< 0.036	< 0.033	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[e]pyrene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[g,h,i]perylene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Benzo[k]fluoranthene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Chrysene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Dibenzo[a,h]anthracene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Fluoranthene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Fluorene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Naphthalene	-	-	-	-	< 0.07	< 0.08	< 0.08	< 0.09	< 0.08	< 0.08	< 0.07	-
Perylene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Phenanthrene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-
Pyrene	-	-	-	-	< 0.013	< 0.015	< 0.015	< 0.017	< 0.016	< 0.015	< 0.014	-

Notes:

Units are mg/kg unless otherwise stated

Any results exceeding adopted criteria are shaded accordingly.

- = not analysed

m bgl = metres below ground level

1: National Environmental Standards for Managing and Assessing Contaminants in Soil to Protect Human Health' - Soil Contaminant Standards (SCS), (MfE, 2012) - Residential 10% produce

* Values not provided for in NESCS, National Environment Protection (Assessment of Site Contamination) Measure 2011 used

2: New Zealand Guidelines for Assessing and Managing Asbestos in Soil (GAMAS, 2017) - Residential land use.

3: Natural Background Concentrations in the Waikato Region (WRC)

Table C1 - Soil Analytical Results

Sample Reference	NESCS SCS - Residential 10% Produce Land-Use ¹	NZ GAMAS ²	Predicted Background Soil Concentrations ³	C2	C3	C4	C5	C6	C7	C8
Laboratory References				3554478.15	3554478.16	3554478.17	3577088.54	3577088.53	3577088.55	3577088.56
Sample Depth (m bgl)				0.15	0.15	0.15	0.15	0.15	0.15	0.15
Date				22-Apr-24	22-Apr-24	22-Apr-24	10-May-24	10-May-24	10-May-24	11-May-24
pH (pH units)	-	-	-	6.1	5.8	5.5	5.6	5.6	5.7	5.7
Asbestos (semi-quantitative)										
Asbestos Presence / Absence	-	-	-	-	-	-	-	-	-	-
Asbestos in ACM as % of Total Sample (%w/w)	-	0.01	-	-	-	-	-	-	-	-
Combined FA & AF as % Total Sample (%w/w)	-	0.001	-	-	-	-	-	-	-	-
Heavy Metals										
Total Recoverable Arsenic	20	-	6.8	-	-	-	-	-	-	-
Total Recoverable Cadmium	3	-	0.22	0.45	0.68	0.58	0.93	1.13	1.07	0.72
Total Recoverable Chromium	460	-	30	-	-	-	-	-	-	-
Total Recoverable Copper	> 10,000	-	25	-	-	-	-	-	-	-
Total Recoverable Lead	210	-	20	-	-	-	-	-	-	-
Total Recoverable Nickel	400*	-	7.6	-	-	-	-	-	-	-
Total Recoverable Zinc	8,000*	-	53	-	-	-	-	-	-	-
Organochlorine Pesticides										
2,4'-DDD	-	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
4,4'-DDD	-	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
2,4'-DDE	-	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
4,4'-DDE	-	-	-	< 0.016	< 0.015	< 0.017	0.03	0.029	< 0.018	< 0.015
2,4'-DDT	-	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
4,4'-DDT	-	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
Total DDT Isomers	70	-	-	< 0.10	< 0.09	< 0.10	< 0.10	< 0.10	< 0.11	< 0.09
Dieldrin	2.6	-	-	< 0.016	< 0.015	< 0.017	< 0.016	< 0.017	< 0.018	< 0.015
All other OCPs	-	-	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
PAH - Polycyclic Aromatic Hydrocarbons										
Total of Reported PAHs in Soil	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-
Benzo[a]anthracene	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene (BAP)	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor	10	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene Toxic Equivalence	-	-	-	-	-	-	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	-	-	-	-	-	-	-	-	-
Benzo[e]pyrene	-	-	-	-	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	-	-	-	-
Benzo[k]fluoranthene	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-
Dibenzo[a,h]anthracene	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-
Perylene	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-

Notes:

Units are mg/kg unless otherwise stated

Any results exceeding adopted criteria are shaded accordingly.

- = not analysed

m bgl = metres below ground level

1: National Environmental Standards for Managing and Assessing Contaminants in Soil to Protect Human Health' - Soil Contaminant Standards (SCS), (MfE, 2012) - Residential 10% produce

* Values not provided for in NESCS, National Environment Protection (Assessment of Site Contamination) Measure 2011 used

2: New Zealand Guidelines for Assessing and Managing Asbestos in Soil (GAMAS, 2017) - Residential land use.

3: Natural Background Concentrations in the Waikato Region (WRC)

6.0 Discussion

6.1 National Environmental Standard for Contaminated Soils

It is considered that HAIL A10: “*Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds*” has occurred due to the detection of 4,4- DDE at four sample locations, including two composite samples. This is considered likely to be a results of pesticide application as part of ongoing cropping and pastoral landuse. However, the concentration of total DDT isomers was below the LLOR and therefore it is considered that the risk to human health and the environment from OCPs in soil is highly unlikely.

HAIL E1: “*Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition*” was considered as part of this assessment based on the age of the former structures at the Site. Potential asbestos-containing materials were noted on a building in the east of the Site, and on the milking shed in the west of the Site however was noted to be in fair condition . Asbestos was not detected in any of the soil samples collected at the Site. As such, it is considered highly unlikely that asbestos in a deteriorated condition, such that it would result in asbestos fibres entering soil beneath structures, has been present onsite.

Hand augers completed within the areas of identified soil disturbance in the historic aerals did not identify any anthropogenic material and therefore HAIL G3: “*Landfill sites*” associated with uncontrolled fill of historic soil disturbance and depressions is considered highly unlikely to have occurred. Concentrations of heavy metals in surface soils at the hand auger locations exceeded the PBC, particularly cadmium and zinc where included in the analytical suite. Elevated concentrations of cadmium and zinc are noted across the Site. It is considered likely that the source of these metals is repeated superphosphate application.

For completeness, consideration has been given to HAIL I “*Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment*” in association with:

- The potential lead impact to soil around the former building from degraded building products (i.e. from lead-based paint which was common during the period of the buildings establishment). Lead was identified to be elevated above predicted background concentrations in two locations, one from around the farm buildings in the west and the other near a historic building in the north east corner of the Site, which is suggestive of limited impact to soil, possibly from the degradation of lead-based paint. However, lead in all soil samples analysed did not exceed the adopted NESCS SCS;
- The potential for cadmium and zinc to be present as a result of repeated application of superphosphate across the pastoral land. Cadmium and zinc in all samples analysed exceeded the predicted background concentrations. None of the samples exceeded the NESCS SCS.

HAIL I requires a hazardous substance to be present in sufficient quantity to pose a risk to human health and/or the environment. On the basis of this assessment, there is no evidence that activities meeting the definition of HAIL I have occurred at the Site.

The Site is considered to be a ‘piece of land’ under the Regulation 5(7) of the NESCS as HAIL A10 is considered more likely than not to have occurred at the Site. Heavy metal concentrations in soil samples were above the predicted background soil concentrations, but below NESCS SCS concentrations. Therefore, a controlled consent under Regulation 9(3) of



the NESCS is required to undertake the change of land use and for future soil disturbance as part of future developments.

6.2 Waikato Regional Council Regional Plan (WRC RP)

The WRC RP glossary definition of a contaminated land:

Contaminated land means land of one of the following kinds:

- 1 If there is an applicable national environmental standard on contaminants in soil, the land is more contaminated than the standard allows; or
- 2 If there is no applicable national environmental standard on contaminants in soil, the land has a hazardous substance in or on it that-
 1. has significant adverse effects on the environment; or
 2. is reasonably likely to have significant adverse effects on the environment

Based on the analytical results, the concentrations do not exceed the NESCS SCS and therefore the Site is highly unlikely to meet the WRC RP definition; as such the contaminated land rules of the WRC RP do not apply.



7.0 Revised Conceptual Site Model

This CSM (Table 6) is based on the results of soil sampling undertaken at the Site, and only focussed on the identified SPRs following the desktop review. The CSM has been developed based on available information, any omissions are not indicative of no risk.

Table 6: Revised Conceptual Site Model

Activity Identified	Potential HAIL Reference	Location On Site	Potential Contaminants	Pathway	Receptor	Discussion and SPR Linkage
Farming activities including pesticides application	A10: <i>Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds</i>	Entire Site	Organochlorine Pesticides	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	Incomplete 4,4-DDE was detected above the LLOR, however total DDT isomers concentrations were below the NESCS.
				Leaching to surface water	Environmental	Highly Unlikely No assessment of groundwater or leachable concentration of OCPs has been undertaken (by Toxicity Characteristic Leaching Procedure (TCLP)). However, the concentration of contaminants were below the adopted environmental and ecological criteria.
Historic building with potential asbestos containing materials	E1: <i>Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition</i>	Historic building footprint	Asbestos	Inhalation	Site users and maintenance/excavation workers	Incomplete Although asbestos was noted during the Site walkover, the condition of the asbestos was noted to be fair and asbestos was not detected in any samples collected.
Infilling of historic surface depressions/borrow pits and minor farm dumps	G3: <i>Landfill sites</i>	Areas of soil disturbance	Heavy metals, Polycyclic Aromatic Hydrocarbons (PAH)	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	Incomplete No evidence of anthropogenic material was identified during the investigation, with concentrations of heavy metals and PAHs below the NESCS SCS.
				Leaching to surface water	Environmental	Highly Unlikely No assessment of groundwater or leachable concentration of heavy metals or PAHs has been undertaken (by Toxicity Characteristic Leaching Procedure (TCLP)). However, the concentration of contaminants was below adopted environmental and ecological criteria.
Farming activities including superphosphate use	I: <i>Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.</i>	Entire Site	Cadmium and Zinc	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	Incomplete Cadmium was detected above the predicted background concentrations however concentrations were below the NESCS.
				Leaching to surface water	Environmental	Highly Unlikely No assessment of groundwater or leachable concentration of cadmium has been undertaken (by Toxicity Characteristic Leaching Procedure (TCLP)). However, the concentration of cadmium was reported below adopted environmental and ecological criteria.
Degradation of potential lead-based paint on the residential buildings, garage and shed		Former buildings	Lead	Direct contact, inhalation and/or ingestion	Site users and maintenance/excavation workers	Incomplete Lead was detected above the predicted background concentrations however concentrations were below the NESCS.
				Leaching to surface water	Environmental	Highly Unlikely No assessment of groundwater or leachable concentration of lead has been undertaken (by Toxicity Characteristic Leaching Procedure (TCLP)). However, the concentration of lead were reported below the adopted environmental and ecological criteria.



8.0 Conclusions

The purpose of this PSI/DSI is to understand the nature and extent of soil contamination (if any) arising from historical uses of the Site, including Hazardous Activities and Industries List (HAIL) activities that have been identified as being, have been, or are likely to have been conducted at the Site.

The soil investigation involved the collection of 32 surface soil samples from across the Site to be composited, 27 samples from eight hand augers and 19 samples from existing or historical buildings. The general geology encountered was topsoil (sandy silt) underlain by orange-brown sandy silt (Hinuera Formation).

It is considered highly likely that HAIL A10: “*Persistent pesticide bulk storage or use, including sports turfs, market gardens, orchards, glass houses or spray sheds*” has occurred at the Site. 4,4- DDE was detected above the laboratory limit of reporting however total DDT isomer concentrations were below the NESCS SCS. All other contaminants of concern were below human health and environmental criteria. Soil analytical results indicate that contaminants in soil across the Site are highly unlikely to pose a risk to human health and the environment during earthworks associated with future developments.

The Site is considered to be a ‘piece of land’ under the Regulation 5(7) of the NESCS. Heavy metal concentrations in soil samples were above the predicted background soil concentrations, but below NESCS SCS concentrations. Therefore, a controlled consent under Regulation 9(3) of the NESCS is required to undertake the change of land use and for future soil disturbance as part of future developments.

The Site does not meet the definition of Contaminated Land under the WRCRP and therefore the rules do not apply.

9.0 Report Status

This report has been approved by Nigel Mather, a Suitably Qualified and Experienced Practitioner (SQEP) as outlined in the MfE *Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils, 2021* (CLMG No.5) and the Resource Management (NESCS) Regulations, 2011.

This report fulfils the requirements of a PSI-DSI as outlined in the MfE CLMG No.1 – *Reporting on Contaminated Sites in New Zealand, 2021* (CLMG No.1).



10.0 References

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- Retrolens, 2024. Retrieved from <https://retrolens.co.nz/> and licensed by LINZ CC-BY 3.0, accessed June 2024.
- Waikato Regional Council. (2023). Natural background concentrations in the Waikato region. Retrieved from <https://www.waikatoregion.govt.nz/services/regional-services/waste-hazardous-substances-and-contaminated-sites/contaminated-sites/natural-background-concentrations/>, accessed August 2023.





Appendix A Photographic Log

Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

SLR Project No.: 880.016550.00001001

28 May 2025



Eldonwood – Photographic Log

Photo 1: Generic soil profile and condition (April 22, 2024)



Photo 2: General view of Site, looking west (April 2024)



Photo 3: General view of Site, looking south (April 2024)



Photo 4: General view of Site, looking north (May 2024)



Photo 5: Vegetation with minor wood stockpile (April 2024)



Photo 6: Vegetation stockpile (April 2024)



Photo 7: Chemical and fuel storage (May 2024)



Photo 8: Tyre stockpile (April 2024)



Photo 9: Small amount of anthropogenic waste noted inside farm sheds (April 2024)



Photo 10: Farm buildings with potential asbestos containing material (May 2024)





Appendix B Land Use Information Register

Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

SLR Project No.: 880.016550.00001001

28 May 2025

SELECTED LAND USE SITE REPORT

Waikato Regional Council maintains a register of properties known to be contaminated based on chemical measurements, or potentially contaminated based on past land use. The Land Use Information Register is still under development and should not be regarded as comprehensive.

Report Created	13 Dec 2023 09:11:16PM
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Report ID	3238
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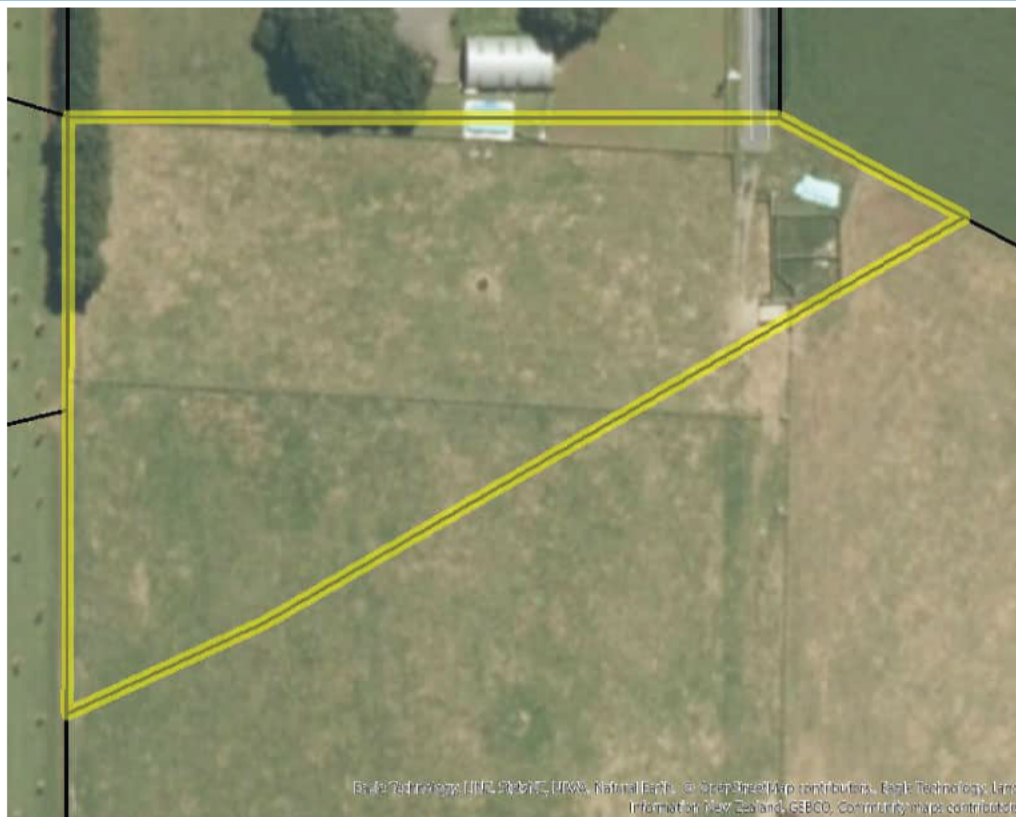
This report contains information held in the Waikato Regional Council Land Use Information Register for:

Valuation number (VRN)	05320/486/14
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Address	STATION ROAD
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Legal description	Lot 4 DP 384886
--------------------------	-----------------

Aerial view of property



SELECTED LAND USE SITE REPORT

This property appears on the Land Use Information Register.

☐ Yes ☒ No

IMPORTANT THINGS TO NOTE

Information NOT recorded in the Land Use Information Register

- The use of lead-based paint
- The use of asbestos in building materials
- The broadacre use of superphosphate fertiliser
- Historic aerial photography. You can view historic aerial images free of charge at www.retrofens.co.nz - we recommend this resource is consulted for any HAIL assessment

District council information

Our records are not integrated with those of territorial authorities (district councils). We recommend contacting the appropriate territorial authority to complete your audit of council records if you have not already done so. In general, information about known contaminated land will also be included on a property LIM report produced by the territorial authority.

Soils investigation information "Unverified HAIL" and "Verified HAIL-No Sampling" sites are included on the register for land use information only. If you require specific soil investigation or consent related information for sampled sites please submit a request using the online [Request for Service](#) form and include the site number and report ID as the reference details. Your request may take up to 20 days to process. If your enquiry is urgent, please note this foremost in your enquiry and we will do our best to assist.

General contaminated land information For more general guidance or information relating to contaminated land, please refer to our website www.waikatoregion.govt.nz

SELECTED LAND USE SITE REPORT

Waikato Regional Council maintains a register of properties known to be contaminated based on chemical measurements, or potentially contaminated based on past land use. The Land Use Information Register is still under development and should not be regarded as comprehensive.

Report Created 13 Dec 2023 09:13:53PM

Report ID 3239

This report contains information held in the Waikato Regional Council Land Use Information Register for:

Valuation number (VRN) 05320/486/15

Address STATION ROAD

Legal description Lot 5 DP 384886

Aerial view of property



SELECTED LAND USE SITE REPORT

This property appears on the Land Use Information Register.

☐ Yes ☒ No

IMPORTANT THINGS TO NOTE

Information NOT recorded in the Land Use Information Register

- The use of lead-based paint
- The use of asbestos in building materials
- The broadacre use of superphosphate fertiliser
- Historic aerial photography. You can view historic aerial images free of charge at www.retrofens.co.nz - we recommend this resource is consulted for any HAIL assessment

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Waikato Regional Council maintains a register of properties known to be contaminated based on chemical measurements, or potentially contaminated based on past land use. The Land Use Information Register is still under development and should not be regarded as comprehensive.

Report Created	18 Apr 2024 08:42:45PM
Report ID	4266

This report contains information held in the Waikato Regional Council Land Use Information Register for:

Valuation number (VRN)	05317/009/99
Address	ELDONWOOD DRIVE
Legal description	Lot 106 DP 393306 Lot 204 DP 535395 Lot 25 DP 393306

Aerial view of property



SELECTED LAND USE SITE REPORT

HAZARDOUS ACTIVITIES AND INDUSTRIES LIST (HAIL)

This property appears on the Land Use Information Register.

☒ Yes ☐ No

Site	LUI10840
Site name	42 Jellicoe Road Matamata
Site status	Current Record
Classification category	Remediated

Aerial view of site



HAIL category	A Chemical manufacture, application and bulk storage
HAIL description	A10. Persistent pesticide bulk storage or use
HAIL from	
HAIL to	
HAIL category	G. Cemeteries and waste recycling, treatment and disposal
HAIL description	G3. Landfill sites
HAIL from	
HAIL to	
HAIL category	I. Other land subjected to the release of a hazardous substance
HAIL description	
HAIL from	
HAIL to	

SELECTED LAND USE SITE REPORT

IMPORTANT THINGS TO NOTE

Information NOT recorded in the Land Use Information Register

- The use of lead-based paint
- The use of asbestos in building materials
- The broadacre use of superphosphate fertiliser
- Historic aerial photography. You can view historic aerial images free of charge at www.retro lens.co.nz - we recommend this resource is consulted for any HAIL assessment

District council information

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Soils investigation information "Unverified HAIL" and "Verified HAIL-No Sampling" sites are included on the register for land use information only. If you require specific soil investigation or consent related information for sampled sites please submit a request using the online [Request for Service](#) form and include the site number and report ID as the reference details. Your request may take up to 20 days to process. If your enquiry is urgent, please note this foremost in your enquiry and we will do our best to assist.

General contaminated land information For more general guidance or information relating to contaminated land, please refer to our website www.waikatoregion.govt.nz

SELECTED LAND USE SITE REPORT

Waikato Regional Council maintains a register of properties known to be contaminated based on chemical measurements, or potentially contaminated based on past land use. The Land Use Information Register is still under development and should not be regarded as comprehensive.

Report Created 18 Apr 2024 09:06:40PM

Report ID 4268

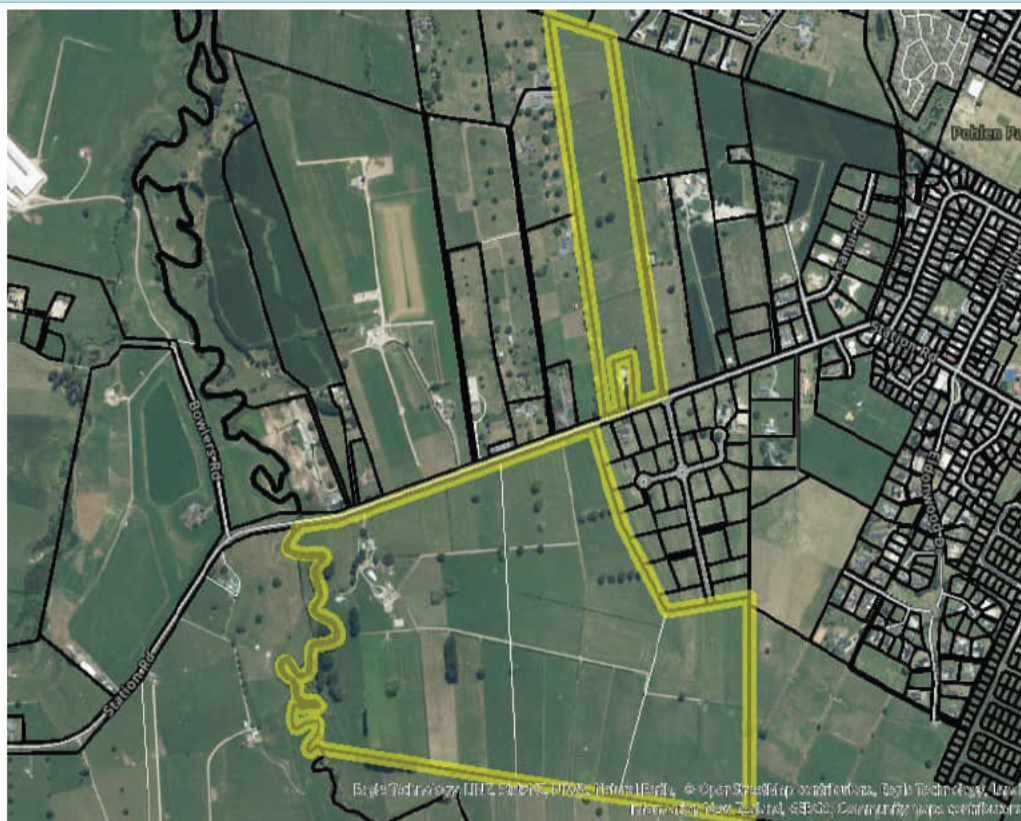
This report contains information held in the Waikato Regional Council Land Use Information Register for:

Valuation number (VRN) 05320/489/02

Address STATION ROAD

Legal description Lot 2 DP 21055 Lot 2 DP 567678 Lot 3 DPS 14362 P/L 1 DP 21055

Aerial view of property



SELECTED LAND USE SITE REPORT

This property appears on the Land Use Information Register.

☐ Yes ☒ No

IMPORTANT THINGS TO NOTE

Information NOT recorded in the Land Use Information Register

- The use of lead-based paint
- The use of asbestos in building materials
- The broadacre use of superphosphate fertiliser
- Historic aerial photography. You can view historic aerial images free of charge at www.retrofens.co.nz - we recommend this resource is consulted for any HAIL assessment

District council information

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General contaminated land information For more general guidance or information relating to contaminated land, please refer to our website www.waikatoregion.govt.nz




From: [REDACTED]
Sent on: Wednesday, 24 April 2024 3:23:35 pm
To: [REDACTED]
Subject: REQ208892 - LUI10840 (Report 4266)

You don't often get email from [REDACTED]. [Learn why this is important](#)

Afternoon Oliver,

Thank you for your enquiry regarding soil investigations reports held on WRC records associated with LUI10840 – 42 Jellicoe Road.

Please see the link attached for all reports for this record:  [REDACTED]

I note this WRC are currently reviewing LUI10840 as this site was partially remediated. This is due to the farm dump requiring further investigation with respect to insufficient depth sampling.

Kind regards,

Josh

Joshua Evans | SCIENTIST -- CONTAMINATED LAND | Geothermal & Air, Land Ecology & Contamination, Science, Policy
WAIKATO REGIONAL COUNCIL | Te Kaunihera ā Rohe o Waikato

[REDACTED]

F: facebook.com/waikatoregion
Private Bag 3038, Waikato Mail Centre, Hamilton, 3240



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Appendix C Historical Aerial Imagery

Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

SLR Project No.: 880.016550.00001001

28 May 2025



Legend

Site Boundary

0 100 m 200 m
© OpenStreetMap contributors



Produced by Datanest.earth

Title: Historical Aerial - 1943

Client: Matamata Development Ltd	Size: A3
-------------------------------------	----------

Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1943
Date: 23-04-2024	Checked: LK	

Proj No: 880.016550.00001	Scale: 1:7986	Version: Final
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Legend

Site Boundary

0 100 m 200 m
© OpenStreetMap contributors




Produced by [Datanest.earth](#)

Title: Historical Aerial - 1966

Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1966
Date: 23-04-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:7556	Version: Final



Legend

 Site Boundary

0 100 m 200 m
© OpenStreetMap contributors



Produced by [Datanest.earth](https://www.datanest.com)

Title: Historical Aerial - 1976		
Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1976
Date: 23-04-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:7556	Version: Final



Legend

Site Boundary

0 100 m 200 m
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Produced by **Datanest.earth**

Title: Historical Aerial - 1981		
Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1981
Date: 23-04-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:9063	Version: Final



Legend

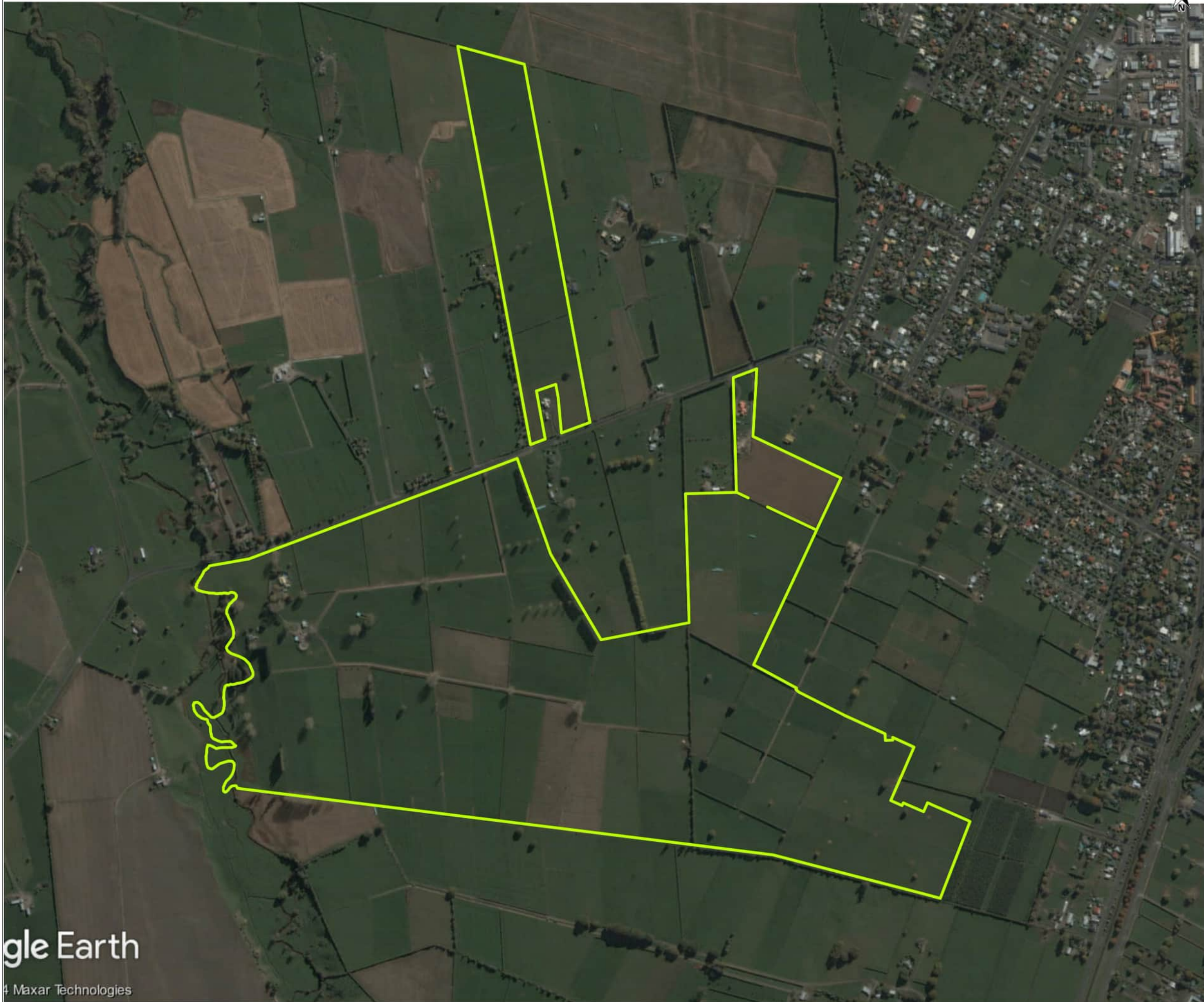
Site Boundary

0 100 m 200 m
© OpenStreetMap contributors



Produced by Datanest.earth

Title: Historical Aerial - 1990		
Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 1990
Date: 24-04-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:9078	Version: Final



Legend

Site Boundary

0 100 m 200 m
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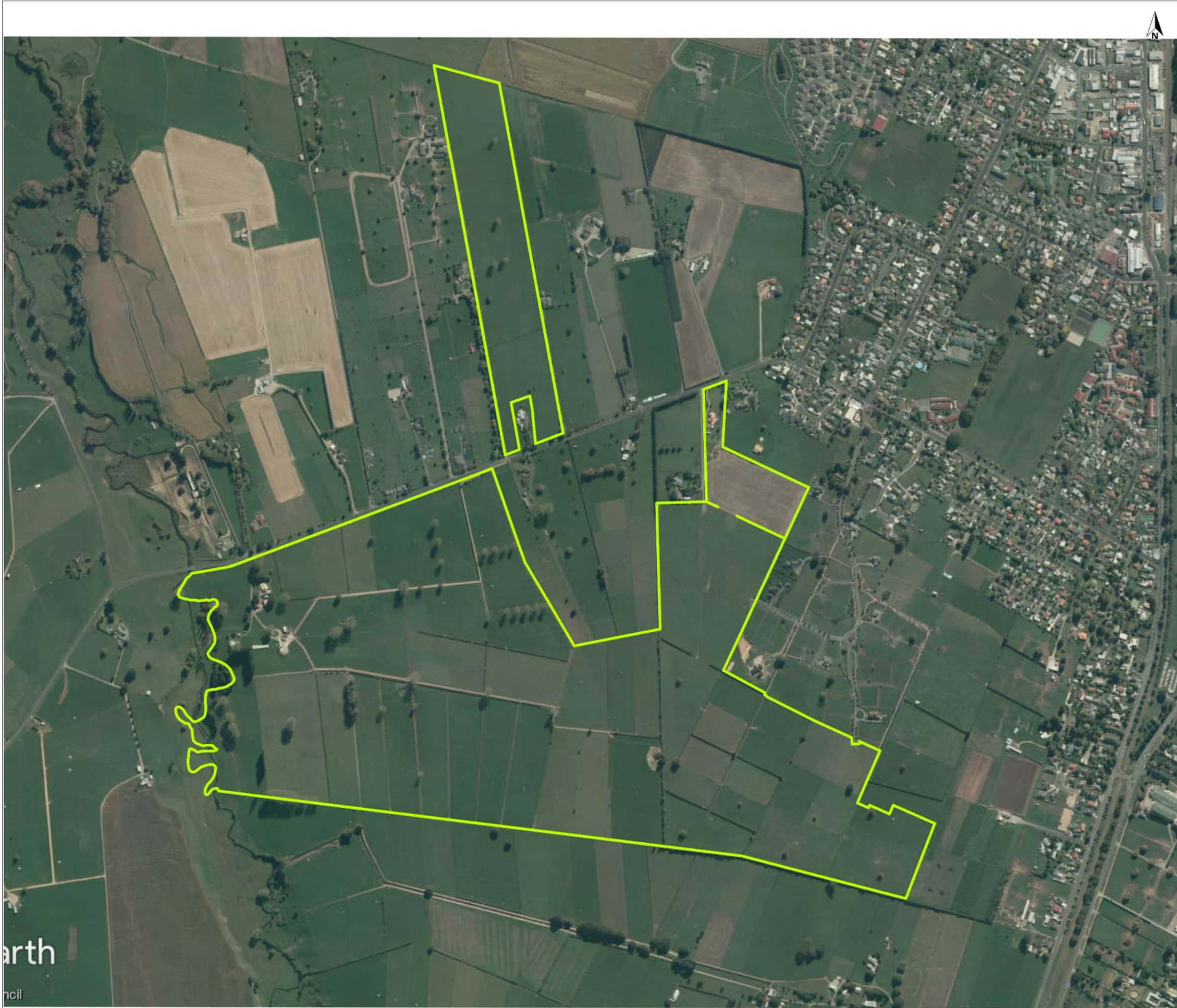
Produced by **Datanest.earth**

Title: Historical Aerial - 2003

Client: Matamata Development Ltd	Size: A3
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Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 2003
Date: 24-04-2024	Checked: LK	

Proj No: 880.016550.00001	Scale: 1:9000	Version: Final
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Legend

Site Boundary

0 100 m 200 m
© OpenStreetMap contributors



Produced by **Datanest.earth**

Title: Historical Aerial - 2013

Client: Matamata Development Ltd	Size: A3
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Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 2013
Date: 24-04-2024	Checked: LK	

Proj No: 880.016550.00001	Scale: 1:9000	Version: Final
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Legend
□ Site Boundary

0 100 m 200 m
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by [Datanest.earth](https://www.datanest.com)

Title: Historical Aerial - 2019		
Client: Matamata Development Ltd		Size: A3
Project: Eldonwood PSI/DSI	Drawn: OT	Figure No.: 2019
Date: 24-04-2024	Checked: LK	
Proj No: 880.016550.00001	Scale: 1:9055	Version: Final



Appendix D Soil Logs

Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

SLR Project No.: 880.016550.00001001

28 May 2025

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
B1	0.0-0.15	Sandy-SILT, dark brown, fine-medium, dry, no plasticity, no odour	Lead and Asbestos (Semi Quantitative) (AsbSQ)	Former or current buildings
	0.3-0.5	Sandy-SILT, brown, fine gradient, slightly damp, low plasticity, roots, no odour	Hold Cold	
B2	0.0-0.15	Silty-SAND, dark brown, fine-medium, dry, no plasticity, roots, no odour	Lead and AsbSQ	
B3	0.0-0.15	Topsoil, sandy-SILT, dark brown, fine, damp, roots, compost-like odour	Lead and AsbSQ	
	0.3-0.5	Sandy-SILT, dark brown, fine gradient, no plasticity, roots, no odour	Hold Cold	
B4	0.0-0.15	Topsoil, sandy-SILT, dark brown, fine-medium, slightly damp, low plasticity, roots, no odours	Lead and AsbSQ	
	0.3-0.5	Silty-SAND, brown, medium-course gradient, slightly damp, no plasticity, roots, no odour	Hold Cold	
B6	0.0-0.15	Topsoil, sandy-SILT, brown, moist, no plasticity, rootlets	Hold Cold	
	0.3-0.5	SILT, orange, moist	Hold Cold	
B7	0.0-0.15	Topsoil, sandy-SILT, brown, moist, no plasticity, leaves, rootlets	Lead and AsbSQ	
	0.3-0.5	SAND, brown, fine-course, moist, rootlets	Hold Cold	
B8	0.0-0.15	Gravelly-SILT, orange, moist, no plasticity	Lead and AsbSQ	
B9	0.0-0.15	Sand-clay-silt-GRAVEL, brown and orange with mottled grey, moist, no plasticity, fill material	AsbSQ	
	0.3-0.5	SILT, orange, moist, no plasticity, Natural	Hold Cold	
B10	0.0-0.15	Sand, brown, fine-course, moist, no plasticity, rootlets,	Lead and AsbSQ	
B11	0.0-0.15	Topsoil, SILT, brown with mottled orange-brown, moisture, rootlets, leaves	Hold Cold	

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
	0.3-0.5	SILT, orange-brown, moist, no plasticity	Hold Cold	
B12	0.0-0.15	Gravelly-SILT, dark brown, fine-course, moist	Lead	
	0.3-0.5	Silty-SAND, brown and light brown, moist, no plasticity	Hold Cold	
C1_01_0.0-0.15	0.0 – 0.15	Sandy SILT with stones present, dark brown, fine-medium, slightly damp, no plasticity, no odour.	Analysis of composite sample for Cadmium, OCPs, pH	Organochlorine pesticide and superphosphate fertiliser use
C1_02_0.0-0.15		Sandy SILT, dark brown, fine-medium, damp, no plasticity, roots, no odours		
C1_03_0.0-0.15		Sandy SILT, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour		
C1_04_0.0-0.15		Sandy SILT, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour		
C1_04_0.3-0.5	0.3-0.5	SILT, brown, fine gradient, slightly damp, low plasticity, insects present, no odour	Hold Cold	
C2-01_0.0-0.15	0.0 – 0.15	Silty SAND, dark brown, fine-medium, damp, no plasticity, roots, no odour	Analysis of composite sample for Cadmium, OCPs, pH	
C2-02_0.0-0.15		Topsoil, silty-SAND, dark brown, fine-medium, damp, no plasticity, roots, no odour		
C2-03_0.0-0.15		Topsoil, sandy-SILT, dark brown, fine, damp, no plasticity, roots, no odour		
C2-04_0.0-0.15		Topsoil, sandy-SILT, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour		
C2_04_0.3-0.5	0.3-0.5	SILT, light grey with mottles light brown and orange, fine, slightly damp, slight plasticity, no organics, no odour	Hold Cold	
C3-01_0.0-0.15	0.0 – 0.15	Topsoil, sandy-SILT, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour	Analysis of composite sample for Cadmium, OCPs, pH	

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
C3-02_0.0-0.15		Topsoil, sandy-SILT, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour		
C3-03_0.0-0.15		Silty-SAND with stones present, dark brown, fine-medium, slightly damp, no plasticity, roots, no odour		
C3-04_0.0-0.15		Silty-SAND with gravel and stones, dark brown, medium, dry, no plasticity, roots, no odour		
C3_03_0.3-0.5	0.3-0.5	Sandy-SILT, light brown, fine-medium, damp, slight plasticity, no odour	Hold Cold	
C4-01_0.0-0.15	0.0 – 0.15	Sandy-SILT, dark brown, fine-medium, dry, no plasticity, roots, no odour	Analysis of composite sample for Cadmium, OCPs, pH	
C4-02_0.0-0.15		Sandy-SILT, dark brown, fine-medium, damp, roots, no odour		
C4-03_0.0-0.15		Sandy-SILT, dark brown with mottled light brown, fine-medium, damp, slight plasticity, roots, no odour		
C4-04_0.0-0.15		Topsoil, sandy-SILT with pebbles present, fine-course, slightly damp, no plasticity, roots, no odour		
C4_04_0.3-0.5	0.3-0.5	Sandy-SILT, brown, fine gradient, damp, slight plasticity, no organics, no odour	Hold Cold	
C5-01_0.0-0.15	0.0 – 0.15	SILT, brown, moist, no plasticity, rootlets	Analysis of composite sample for Cadmium, OCPs, pH	
C5-02_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets		
C5-03_0.0-0.15		Topsoil, Sandy-SILT, brown, moist, no plasticity, rootlets		
C5-04_0.0-0.15		Sandy SILT, dark brown, moist, no plasticity, rootlets		
C5_04_0.3-0.5	0.3-0.5	Clay-sandy-SILT, orange and yellowish light brown, moist, medium plasticity,	Hold Cold	

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
C6-01_0.0-0.15	0.0 – 0.15	Sandy-SILT, dark brown with orange mottle, moist, no plasticity, rootlets	Analysis of composite sample for Cadmium, OCPs, pH	
C6-02_0.0-0.15		Topsoil, sandy-SILT, brown, moist, no plasticity rootlets.		
C6-03_0.0-0.15		Sandy-SILT, dark brown, moist, no plasticity, rootlets		
C6-04_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets		
C6_04_0.3-0.5	0.3-0.5	SILT, orange-brown, moist, no plasticity	Hold Cold	
C7-01_0.0-0.15	0.0 – 0.15	Sandy-SILT, brown, moist, no plasticity, rootlets	Analysis of composite sample for Cadmium, OCPs, pH	
C7-02_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets		
C7-03_0.0-0.15		Sandy-SILT, brown with orange mottle, moist, no plasticity, rootlets		
C7-04_0.0-0.15		Sandy-SILT, dark brown, moist, no plasticity, rootlets		
C7_04_0.3-0.5	0.3-0.5	SILT, orange-brown, moist, no plasticity	Hold Cold	
C8-01_0.0-0.15	0.0 – 0.15	Sandy-SILT, brown, moist, no plasticity, rootlets	Analysis of composite sample for Cadmium, OCPs, pH	
C8-02_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets, freshly planted grass		
C8-03_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets		
C8-04_0.0-0.15		Sandy-SILT, brown, moist, no plasticity, rootlets. Freshly planted grass		
C8_04_0.3-0.5	0.3-0.5	Sandy-SILT, orange-brown, moist, no plasticity	Hold Cold	
HA01	0.0-0.15	Silty-SAND, dark brown, dry, no plasticity, organics, no odour.	Hold Cold	Potential fill areas
	0.5	Sandy-SILT, brown, damp, no plasticity, roots, no odour	Hold Cold	
	1.0	Natural soil hit	Hold Cold	

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
HA02	0.0-0.15	Silty-SAND, dark brown and black, refusal with stones	Heavy metals, AsbSQ and PAHs	
HA03	0.0-0.15	Silty, SAND with gravel, dark brown and black, fine-medium, slightly damp, no plasticity, refusal at 0.15m	Heavy metals, AsbSQ and PAHs	
HA04	0.0-0.15	Sandy-SILT with gravel, brown, fine-medium, dry, no plasticity, roots, no odour	Heavy metals and PAHs	
	0.3-0.5	Sandy-SILT with gravel, brown, fine-large, slightly damp, no plasticity, roots, no odour	Hold Cold	
HA05	0.15	Topsoil, sandy-SILT, brown, moist, no plasticity, rootlets	Heavy metals, OCPs and PAHs	
	0.5	SILT, orange-brown, moist, no plasticity	Hold Cold	
	1.0	Sandy-SILT, orange, moist, no plasticity	Hold Cold	
	1.5	Clay-sandy-SILT, orange-brown, moist, no plasticity	Hold Cold	
	2.0	Silty-SAND, light brown-orange, moist, no plasticity	Hold Cold	
HA06	0.15	TOPSOIL, sandy-SILT, dark brown, moist, no plasticity, rootlets	Heavy metals, OCPs and PAHs	
	0.5	SILT, orange-brown, moist, no plasticity	Hold Cold	
	1.0	Clay-SILT, orange-brown, moist, no plasticity	Hold Cold	
	1.5	Clay-sandy-SILT, orange-brown, moist, no plasticity	Hold Cold	
	2.0	Sandy-SILT, orange-brown with black speckles, moist, no plasticity	Hold Cold	
HA07	0.15	Topsoil, sandy-SILT, dark grey, moist, no plasticity, rootlets	Heavy metals, OCPs and PAHs	
	0.5	Sandy-SILT, light brown, moist, no plasticity	Hold Cold	

Sample ID	Depth (m bgl)	Soil Type	Laboratory Analysis	Rationale
	1.0	SILT, yellowish-white, moist, no plasticity	Hold Cold	
	1.5	Sandy-SILT, light grey-brown, moist, no plasticity	Hold Cold	
	2.0	Silty-SAND, grey and brown, fine-medium, moist, no plasticity	Hold Cold	
HA08	0.15	Topsoil, sandy-SILT, dark brown, moist, no plasticity, rootlets	Heavy metals, OCPs and PAHs	
	0.5	Silty SAND, brown, fine-medium, moist, no plasticity, rootlets	Hold Cold	
	1.0	Silty SAND, light grey-brown with orange mottle, medium-coarse, moist, no plasticity	Hold Cold	
	1.5	Clay-SILT, light grey-brown, moist, no plasticity	Hold Cold	
	2.0	Silty-CLAY, light grey with orange mottle, moist, no plasticity, very soft	Hold Cold	



Appendix E Laboratory Analytical Report and Chain of Custody Information

Preliminary and Detailed Site Investigation

Eldonwood Drive and Station Road

Matamata Development Limited

SLR Project No.: 880.016550.00001001

28 May 2025

Certificate of Analysis

Page 1 of 2

Client:	SLR Consulting New Zealand Limited	Lab No:	3554478	SPV1
Contact:	Lucie Kibblewhite	Date Received:	22-Apr-2024	
	C/- SLR Consulting New Zealand Limited	Date Reported:	09-May-2024	
	PO Box 1420	Quote No:	97403	
	Waikato Mail Centre	Order No:		
	Hamilton 3240	Client Reference:	16550 - Matamata	
		Submitted By:	Austin Boyce	

Sample Type: Soil

Sample Name:	Composite of C2-01_0.0-0.15, C2-02_0.0-0.15, C2-03_0.0-0.15 & C2-04_0.0-0.15	Sample Name:	Composite of C3-02_0.0-0.15, C3-03_0.0-0.15 & C3-04_0.0-0.15	Sample Name:	Composite of C4-01_0.0-0.15, C4-02_0.0-0.15, C4-03_0.0-0.15 & C4-04_0.0-0.15
Lab Number:	3554478.15	Lab Number:	3554478.16	Lab Number:	3554478.17
Individual Tests					
Dry Matter	g/100g as rcvd	65	67	60	
Total Recoverable Cadmium	mg/kg dry wt	0.45	0.68	0.58	
pH*	pH Units	6.1	5.8	5.5	
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
alpha-BHC	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
beta-BHC	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
delta-BHC	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
gamma-BHC (Lindane)	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
cis-Chlordane	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
trans-Chlordane	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
2,4'-DDD	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
4,4'-DDD	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
2,4'-DDE	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
4,4'-DDE	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
2,4'-DDT	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
4,4'-DDT	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Total DDT Isomers	mg/kg dry wt	< 0.10	< 0.09	< 0.10	
Dieldrin	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endosulfan I	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endosulfan II	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endosulfan sulphate	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endrin	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endrin aldehyde	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Endrin ketone	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Heptachlor	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Heptachlor epoxide	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Hexachlorobenzene	mg/kg dry wt	< 0.016	< 0.015	< 0.017	
Methoxychlor	mg/kg dry wt	< 0.016	< 0.015	< 0.017	



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

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	15-17
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%.	-	15-17
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	15-17
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	15-17
Dry Matter	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	15-17
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	15-17
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-7, 9-12
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	15-17
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH. In-house.	0.1 pH Units	15-17

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

Testing was completed between 07-May-2024 and 09-May-2024. For completion dates of individual analyses please contact the laboratory.

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

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Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 3

Client:	SLR Consulting New Zealand Limited	Lab No:	3556223	SPV1
Contact:	Lucie Kibblewhite	Date Received:	23-Apr-2024	
	C/- SLR Consulting New Zealand Limited	Date Reported:	10-May-2024	
	PO Box 1420	Quote No:	97403	
	Waikato Mail Centre	Order No:		
	Hamilton 3240	Client Reference:	16550-Matamata	
		Submitted By:	Austin Boyce	

Sample Type: Soil						
Sample Name:		HA04_0.0-0.15 23-Apr-2024	HA03_0.0-0.15 23-Apr-2024	HA02_0.0-0.15 23-Apr-2024	B4_0.0-0.15 23-Apr-2024	B3_0.0-0.15 23-Apr-2024
Lab Number:		3556223.1	3556223.3	3556223.4	3556223.8	3556223.10
Individual Tests						
Dry Matter	g/100g as rcvd	66	66	74	-	-
Total Recoverable Lead	mg/kg dry wt	-	-	-	11.1	13.7
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	6	15	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.30	0.47	0.48	-	-
Total Recoverable Chromium	mg/kg dry wt	8	10	15	-	-
Total Recoverable Copper	mg/kg dry wt	20	38	57	-	-
Total Recoverable Lead	mg/kg dry wt	14.9	14.4	29	-	-
Total Recoverable Nickel	mg/kg dry wt	4	9	11	-	-
Total Recoverable Zinc	mg/kg dry wt	63	112	184	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	< 0.4	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Acenaphthylene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Acenaphthene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Anthracene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.037	< 0.036	< 0.032	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.037	< 0.035	< 0.032	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Chrysene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Fluoranthene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Fluorene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Naphthalene	mg/kg dry wt	< 0.08	< 0.08	< 0.07	-	-
Perylene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Phenanthrene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-
Pyrene	mg/kg dry wt	< 0.015	< 0.015	< 0.013	-	-

Sample Type: Soil				
Sample Name:		B2_0.0-0.15 23-Apr-2024	B1_0.0-0.15 23-Apr-2024	Composite of C1_01_0.0-0.15, C1_02_0.0-0.15, C1_03_0.0-0.15 & C1_04_0.0-0.15
Lab Number:		3556223.12	3556223.13	3556223.21
Individual Tests				
Dry Matter	g/100g as rcvd	-	-	68
Total Recoverable Cadmium	mg/kg dry wt	-	-	0.47
Total Recoverable Lead	mg/kg dry wt	10.8	10.5	-
pH*	pH Units	-	-	7.6
Organochlorine Pesticides Screening in Soil				
Aldrin	mg/kg dry wt	-	-	< 0.015
alpha-BHC	mg/kg dry wt	-	-	< 0.015
beta-BHC	mg/kg dry wt	-	-	< 0.015
delta-BHC	mg/kg dry wt	-	-	< 0.015
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.015
cis-Chlordane	mg/kg dry wt	-	-	< 0.015
trans-Chlordane	mg/kg dry wt	-	-	< 0.015
2,4'-DDD	mg/kg dry wt	-	-	< 0.015
4,4'-DDD	mg/kg dry wt	-	-	< 0.015
2,4'-DDE	mg/kg dry wt	-	-	< 0.015
4,4'-DDE	mg/kg dry wt	-	-	< 0.015
2,4'-DDT	mg/kg dry wt	-	-	< 0.015
4,4'-DDT	mg/kg dry wt	-	-	< 0.015
Total DDT Isomers	mg/kg dry wt	-	-	< 0.09
Dieldrin	mg/kg dry wt	-	-	< 0.015
Endosulfan I	mg/kg dry wt	-	-	< 0.015
Endosulfan II	mg/kg dry wt	-	-	< 0.015
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.015
Endrin	mg/kg dry wt	-	-	< 0.015
Endrin aldehyde	mg/kg dry wt	-	-	< 0.015
Endrin ketone	mg/kg dry wt	-	-	< 0.015
Heptachlor	mg/kg dry wt	-	-	< 0.015
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.015
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.015
Methoxychlor	mg/kg dry wt	-	-	< 0.015

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3-4, 8, 10, 12-13, 21
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%.	-	8, 10, 12-13, 21
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	21
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1, 3-4
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1, 3-4
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	21
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1, 3-4

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 3-4, 21
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	8, 10, 12-13, 21
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	15-18
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	21
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	8, 10, 12-13
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH. In-house.	0.1 pH Units	21
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1, 3-4
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1, 3-4

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

Testing was completed between 07-May-2024 and 10-May-2024. For completion dates of individual analyses please contact the laboratory.

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

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

Martin Cowell - BSc
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 3

Client:	SLR Consulting New Zealand Limited	Lab No:	3556745	A2Pv2
Contact:	Lucie Kibblewhite	Date Received:	24-Apr-2024	
	C/- SLR Consulting New Zealand Limited	Date Reported:	15-May-2024	
	PO Box 1420	Quote No:	97403	
	Waikato Mail Centre	Order No:		
	Hamilton 3240	Client Reference:	16550-Matamata	
		Submitted By:	Austin Boyce	

Sample Type: Soil

Sample Name:	HA03_0.0-0.15 23-Apr-2024	HA02_0.0-0.15 23-Apr-2024	B4_0.0-0.15 23-Apr-2024	B3_0.5-0.15 23-Apr-2024	B2_0.0-0.15 23-Apr-2024
Lab Number:	3556745.2	3556745.3	3556745.5	3556745.7	3556745.9
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	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
As Received Weight	g 455.6	g 697.3	g 527.1	g 359.0	g 520.3
Dry Weight	g 336.6	g 547.2	g 332.6	g 227.0	g 340.5
Moisture*	% 26	% 22	% 37	% 37	% 35
Sample Fraction >10mm	g dry wt 7.3	g dry wt 177.7	g dry wt < 0.1	g dry wt < 0.1	g dry wt < 0.1
Sample Fraction <10mm to >2mm	g dry wt 106.8	g dry wt 198.2	g dry wt 1.7	g dry wt 30.3	g dry wt 7.4
Sample Fraction <2mm	g dry wt 222.1	g dry wt 169.9	g dry wt 330.2	g dry wt 195.9	g dry wt 332.0
<2mm Subsample Weight	g dry wt 53.0	g dry wt 55.6	g dry wt 52.6	g dry wt 56.7	g dry wt 55.8
Weight of Asbestos in ACM (Non-Friable)	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001

Sample Name:	B1_0.0-0.15 23-Apr-2024
Lab Number:	3556745.11
Asbestos Presence / Absence	Asbestos NOT detected.
Description of Asbestos Form	-
Asbestos in ACM as % of Total Sample*	% w/w < 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w < 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w < 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w < 0.001
As Received Weight	g 491.5
Dry Weight	g 318.1
Moisture*	% 35
Sample Fraction >10mm	g dry wt < 0.1

Sample Type: Soil		
Sample Name:	B1_0.0-0.15 23-Apr-2024	
Lab Number:	3556745.11	
Sample Fraction <10mm to >2mm	g dry wt	1.5
Sample Fraction <2mm	g dry wt	315.8
<2mm Subsample Weight	g dry wt	54.4
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001

Glossary of Terms

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

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

The following assumptions have been made:

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

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

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 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; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	2-3, 5, 7, 9, 11
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	2-3, 5, 7, 9, 11
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	2-3, 5, 7, 9, 11
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	2-3, 5, 7, 9, 11
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	2-3, 5, 7, 9, 11
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	2-3, 5, 7, 9, 11
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	2-3, 5, 7, 9, 11
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	2-3, 5, 7, 9, 11
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; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2-3, 5, 7, 9, 11

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2-3, 5, 7, 9, 11
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2-3, 5, 7, 9, 11
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2-3, 5, 7, 9, 11
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	2-3, 5, 7, 9, 11
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2-3, 5, 7, 9, 11
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	2-3, 5, 7, 9, 11

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

Testing was completed between 09-May-2024 and 15-May-2024. For completion dates of individual analyses please contact the laboratory.

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

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



Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

Certificate of Analysis

Page 1 of 5

Client:	SLR Consulting New Zealand Limited	Lab No:	3577088	SPV1
Contact:	Lucie Kibblewhite	Date Received:	10-May-2024	
	C/- SLR Consulting New Zealand Limited	Date Reported:	24-May-2024	
	PO Box 1420	Quote No:	97403	
	Waikato Mail Centre	Order No:	880.016550.00001	
	Hamilton 3240	Client Reference:		
		Submitted By:	Sandra Hamler	

Sample Type: Soil						
Sample Name:		B12/0.15 10-May-2024	B8/0.15 10-May-2024	HA06/0.15 10-May-2024	HA07/0.15 10-May-2024	HA08/0.15 10-May-2024
Lab Number:		3577088.12	3577088.16	3577088.19	3577088.24	3577088.29
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	62	66	72
Total Recoverable Lead	mg/kg dry wt	25	8.7	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	4	5	5
Total Recoverable Cadmium	mg/kg dry wt	-	-	0.82	0.95	0.32
Total Recoverable Chromium	mg/kg dry wt	-	-	8	7	8
Total Recoverable Copper	mg/kg dry wt	-	-	24	21	14
Total Recoverable Lead	mg/kg dry wt	-	-	9.8	17.1	9.9
Total Recoverable Nickel	mg/kg dry wt	-	-	5	5	5
Total Recoverable Zinc	mg/kg dry wt	-	-	166	184	165
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
alpha-BHC	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
beta-BHC	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
delta-BHC	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
cis-Chlordane	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
trans-Chlordane	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
2,4'-DDD	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
4,4'-DDD	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
2,4'-DDE	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
4,4'-DDE	mg/kg dry wt	-	-	0.033	0.044	< 0.014
2,4'-DDT	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
4,4'-DDT	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Total DDT Isomers	mg/kg dry wt	-	-	< 0.10	< 0.09	< 0.09
Dieldrin	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endosulfan I	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endosulfan II	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endrin	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endrin aldehyde	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Endrin ketone	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Heptachlor	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Methoxychlor	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014

Sample Type: Soil						
Sample Name:		B12/0.15 10-May-2024	B8/0.15 10-May-2024	HA06/0.15 10-May-2024	HA07/0.15 10-May-2024	HA08/0.15 10-May-2024
Lab Number:		3577088.12	3577088.16	3577088.19	3577088.24	3577088.29
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	< 0.4	< 0.4	< 0.4
1-Methylnaphthalene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
2-Methylnaphthalene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Acenaphthylene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Acenaphthene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Anthracene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[a]anthracene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	< 0.038	< 0.037	< 0.033
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	< 0.038	< 0.036	< 0.033
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[e]pyrene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Benzo[k]fluoranthene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Chrysene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Fluoranthene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Fluorene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Naphthalene	mg/kg dry wt	-	-	< 0.08	< 0.08	< 0.07
Perylene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Phenanthrene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Pyrene	mg/kg dry wt	-	-	< 0.016	< 0.015	< 0.014
Sample Name:		B7/0.15 10-May-2024	B10/0.15 10-May-2024	HA05/0.15 10-May-2024	Composite of C6 - 02, C6 - 04/0.15, C6 - 03 & C6 - 01	Composite of C5 - 02, C5 - 01, C5 - 04/0.15 & C5 - 03
Lab Number:		3577088.41	3577088.43	3577088.48	3577088.53	3577088.54
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	61	62	62
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	1.13	0.93
Total Recoverable Lead	mg/kg dry wt	31	16.6	-	-	-
pH*	pH Units	-	-	-	5.6	5.6
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	4	-	-
Total Recoverable Cadmium	mg/kg dry wt	-	-	0.82	-	-
Total Recoverable Chromium	mg/kg dry wt	-	-	8	-	-
Total Recoverable Copper	mg/kg dry wt	-	-	21	-	-
Total Recoverable Lead	mg/kg dry wt	-	-	8.8	-	-
Total Recoverable Nickel	mg/kg dry wt	-	-	5	-	-
Total Recoverable Zinc	mg/kg dry wt	-	-	230	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
alpha-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
beta-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
delta-BHC	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
cis-Chlordane	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
trans-Chlordane	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
2,4'-DDD	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
4,4'-DDD	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
2,4'-DDE	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
4,4'-DDE	mg/kg dry wt	-	-	< 0.017	0.029	0.030
2,4'-DDT	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016

Sample Type: Soil						
Sample Name:		B7/0.15 10-May-2024	B10/0.15 10-May-2024	HA05/0.15 10-May-2024	Composite of C6 - 02, C6 - 04/0.15, C6 - 03 & C6 - 01	Composite of C5 - 02, C5 - 01, C5 - 04/0.15 & C5 - 03
Lab Number:		3577088.41	3577088.43	3577088.48	3577088.53	3577088.54
Organochlorine Pesticides Screening in Soil						
4,4'-DDT	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Total DDT Isomers	mg/kg dry wt	-	-	< 0.10	< 0.10	< 0.10
Dieldrin	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endosulfan I	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endosulfan II	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endrin	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endrin aldehyde	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Endrin ketone	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Heptachlor	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Methoxychlor	mg/kg dry wt	-	-	< 0.017	< 0.017	< 0.016
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	< 0.4	-	-
1-Methylnaphthalene	mg/kg dry wt	-	-	< 0.017	-	-
2-Methylnaphthalene	mg/kg dry wt	-	-	< 0.017	-	-
Acenaphthylene	mg/kg dry wt	-	-	< 0.017	-	-
Acenaphthene	mg/kg dry wt	-	-	< 0.017	-	-
Anthracene	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[a]anthracene	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	< 0.040	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	< 0.040	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[e]pyrene	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	< 0.017	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	-	< 0.017	-	-
Chrysene	mg/kg dry wt	-	-	< 0.017	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.017	-	-
Fluoranthene	mg/kg dry wt	-	-	< 0.017	-	-
Fluorene	mg/kg dry wt	-	-	< 0.017	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	< 0.017	-	-
Naphthalene	mg/kg dry wt	-	-	< 0.09	-	-
Perylene	mg/kg dry wt	-	-	< 0.017	-	-
Phenanthrene	mg/kg dry wt	-	-	< 0.017	-	-
Pyrene	mg/kg dry wt	-	-	< 0.017	-	-
Sample Name:		Composite of C7 - 01, C7 - 02, C7 - 03 & C7 - 04/0.15			Composite of C8 - 01, C8 - 02, C8 - 03 & C8 - 04/0.15	
Lab Number:		3577088.55			3577088.56	
Individual Tests						
Dry Matter	g/100g as rcvd	58			65	
Total Recoverable Cadmium	mg/kg dry wt	1.07			0.72	
pH*	pH Units	5.7			5.7	
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.018			< 0.015	
alpha-BHC	mg/kg dry wt	< 0.018			< 0.015	
beta-BHC	mg/kg dry wt	< 0.018			< 0.015	
delta-BHC	mg/kg dry wt	< 0.018			< 0.015	
gamma-BHC (Lindane)	mg/kg dry wt	< 0.018			< 0.015	
cis-Chlordane	mg/kg dry wt	< 0.018			< 0.015	
trans-Chlordane	mg/kg dry wt	< 0.018			< 0.015	

Sample Type: Soil			
Sample Name:		Composite of C7 - 01, C7 - 02, C7 - 03 & C7 - 04/0.15	Composite of C8 - 01, C8 - 02, C8 - 03 & C8 - 04/0.15
Lab Number:		3577088.55	3577088.56
Organochlorine Pesticides Screening in Soil			
2,4'-DDD	mg/kg dry wt	< 0.018	< 0.015
4,4'-DDD	mg/kg dry wt	< 0.018	< 0.015
2,4'-DDE	mg/kg dry wt	< 0.018	< 0.015
4,4'-DDE	mg/kg dry wt	< 0.018	< 0.015
2,4'-DDT	mg/kg dry wt	< 0.018	< 0.015
4,4'-DDT	mg/kg dry wt	< 0.018	< 0.015
Total DDT Isomers	mg/kg dry wt	< 0.11	< 0.09
Dieldrin	mg/kg dry wt	< 0.018	< 0.015
Endosulfan I	mg/kg dry wt	< 0.018	< 0.015
Endosulfan II	mg/kg dry wt	< 0.018	< 0.015
Endosulfan sulphate	mg/kg dry wt	< 0.018	< 0.015
Endrin	mg/kg dry wt	< 0.018	< 0.015
Endrin aldehyde	mg/kg dry wt	< 0.018	< 0.015
Endrin ketone	mg/kg dry wt	< 0.018	< 0.015
Heptachlor	mg/kg dry wt	< 0.018	< 0.015
Heptachlor epoxide	mg/kg dry wt	< 0.018	< 0.015
Hexachlorobenzene	mg/kg dry wt	< 0.018	< 0.015
Methoxychlor	mg/kg dry wt	< 0.018	< 0.015

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	12, 16, 19, 24, 29, 41, 43, 48, 53-56
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	53-56
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%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	12, 16, 41, 43, 53-56
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	53-56
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	19, 24, 29, 48
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	19, 24, 29, 48
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	19, 24, 29, 48, 53-56
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	19, 24, 29, 48
Dry Matter	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	19, 24, 29, 48, 53-56
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	12, 16, 41, 43, 53-56
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-2, 4-10, 34-37, 44-45, 47
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	53-56

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
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	12, 16, 41, 43
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH. In-house.	0.1 pH Units	53-56
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	19, 24, 29, 48
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	19, 24, 29, 48

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

Testing was completed between 20-May-2024 and 24-May-2024. For completion dates of individual analyses please contact the laboratory.

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

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Ara Heron BSc (Tech)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 2

Client:	SLR Consulting New Zealand Limited	Lab No:	3577294	A2Pv1
Contact:	Lucie Kibblewhite	Date Received:	10-May-2024	
	C/- SLR Consulting New Zealand Limited	Date Reported:	23-May-2024	
	PO Box 1420	Quote No:	97403	
	Waikato Mail Centre	Order No:		
	Hamilton 3240	Client Reference:	880.016550.00001	
		Submitted By:	Sandra Hamler	

Sample Type: Soil				
Sample Name:	B9/0.15 09-May-2024	B8/0.15 09-May-2024	B7/0.15 10-May-2024	B10/0.15 10-May-2024
Lab Number:	3577294.3	3577294.5	3577294.16	3577294.18
Asbestos Presence / Absence	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001	% w/w < 0.001
As Received Weight	g 722.6	g 722.1	g 518.1	g 901.7
Dry Weight	g 568.8	g 641.5	g 355.8	g 798.9
Moisture*	% 21	% 11	% 31	% 11
Sample Fraction >10mm	g dry wt 54.2	g dry wt 113.4	g dry wt < 0.1	g dry wt 25.2
Sample Fraction <10mm to >2mm	g dry wt 186.4	g dry wt 237.3	g dry wt 32.2	g dry wt 217.2
Sample Fraction <2mm	g dry wt 327.7	g dry wt 290.4	g dry wt 322.9	g dry wt 556.2
<2mm Subsample Weight	g dry wt 55.2	g dry wt 54.2	g dry wt 55.6	g dry wt 58.1
Weight of Asbestos in ACM (Non-Friable)	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001	g dry wt < 0.00001

Glossary of Terms

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

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

The following assumptions have been made:

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

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



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

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 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; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	3, 5, 16, 18
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	3, 5, 16, 18
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	3, 5, 16, 18
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	3, 5, 16, 18
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	3, 5, 16, 18
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	3, 5, 16, 18
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	3, 5, 16, 18
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	3, 5, 16, 18
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; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	3, 5, 16, 18
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	3, 5, 16, 18
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	3, 5, 16, 18
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	3, 5, 16, 18
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	3, 5, 16, 18
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	3, 5, 16, 18
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	3, 5, 16, 18

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

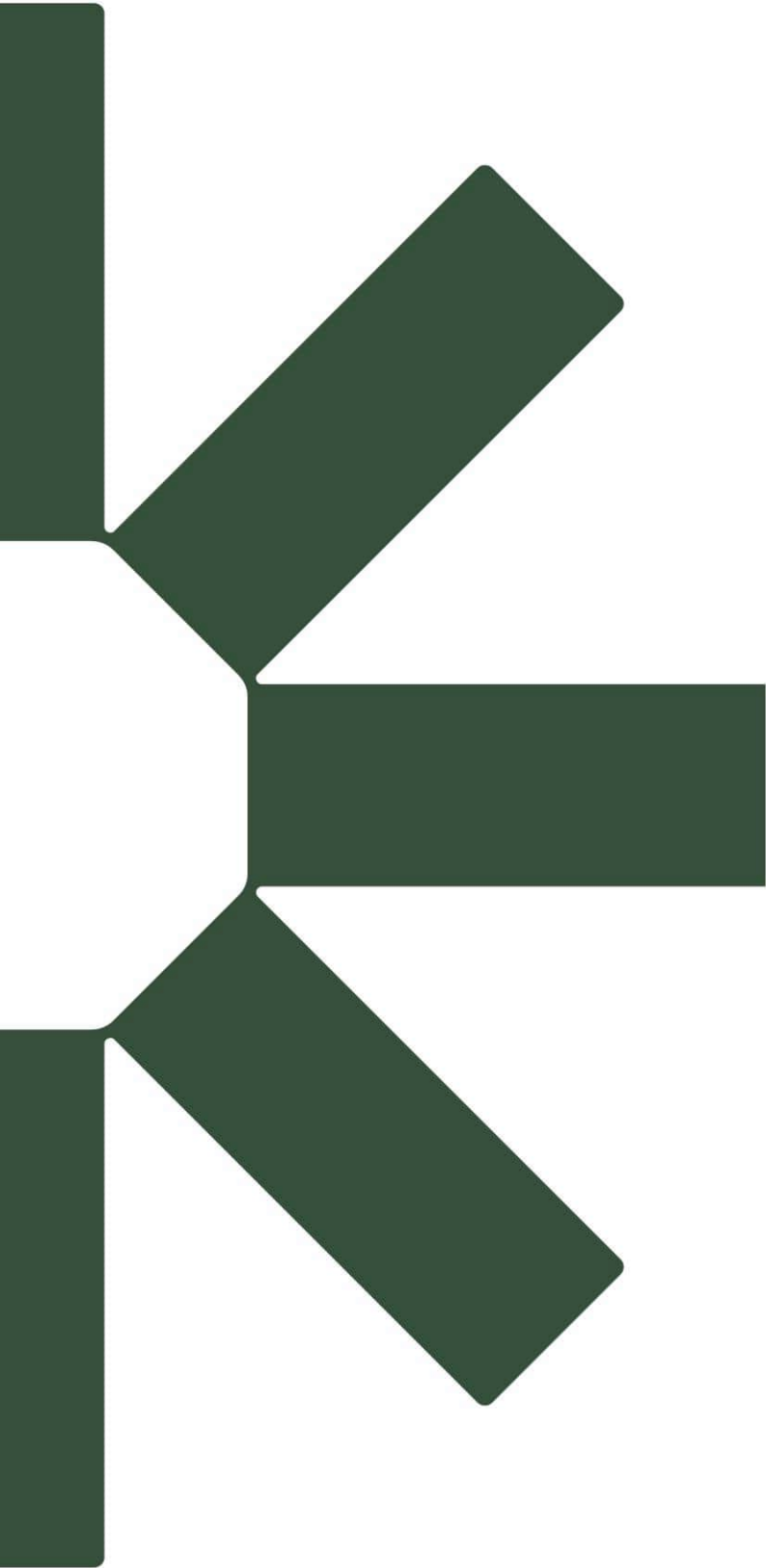
Testing was completed on 23-May-2024. For completion dates of individual analyses please contact the laboratory.

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Rhodri Williams BSc (Hons)
Technical Manager - Asbestos



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