



**Soil Contamination Risk
Preliminary Site Investigation Report**

**64, 86 & 94 Barters Road, Templeton,
Canterbury**

December 2023



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QUALITY CONTROL AND CERTIFICATION SHEET

Client: NTP Development Holdings Ltd

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1 Executive Summary

The site is located 64, 86 and 94 Barthers Road in Templeton, Canterbury. The client is currently completing due diligence as part of the purchasing process. If purchased, the site may be developed in the future. This would likely involve future subdivision of the site, change of use of the land and soil disturbance activities. As such, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NЕСS) require an assessment of the likelihood of soil contamination being present. It is also noted that Momentum Environmental Ltd is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016. This report details the work undertaken to assess the risks.

This Preliminary Site Investigation (PSI) has shown the site has been used for rural and rural residential activities for its known history. Each of the individual properties within the site currently contain a dwelling, sheds and pastoral land used for grazing animals. The PSI has identified the following potential sources of contamination, as per the Hazardous Activities and Industries List (HAIL):

- A potential livestock dip or spray race operation in animal yards visible in the 1962 aerial photograph at 86 Barthers Road (HAIL A8).
- The potential use of farm structures for storage and mixing of persistent pesticides on both 86 and 94 Barthers Road from as early as 1941 (HAIL A10).
- A rusted aboveground fuel storage tank present at 94 Barthers Road (HAIL A17).
- A broken fence likely containing asbestos at 64 Barthers Road (HAIL E1).
- Historical structures both existing and demolished posing a risk of lead contamination in surrounding soils at 86 and 94 Barthers Road (HAIL I).
- Burn areas at 86 and 94 Barthers Road (HAIL I).
- Storage areas including items of scrap such as metal, plastic and wood at 86 Barthers Road (HAIL I).
- A bund of soils containing demolition debris at 94 Barthers Road (HAIL I).

There may be a risk to human health from contaminated soils in the locations of these activities. The approximate areas considered at risk of contamination are shown on the Site Inspection Plans attached as **Appendix D**. It is recommended that further investigation of the risk areas in the form of a Detailed Site Investigation be completed, prior to development of the site.

In terms of planning status at the time of writing of this report, the NESCS does apply to the site. Future activities that trigger the NESCS may require resource consent..

2 Objectives of the Investigation

This report has been prepared in general accordance with the Ministry for the Environment's "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021". This report includes all requirements for a Preliminary Site Investigation report.

The objective of this report is to:

- Collect and assess information from multiple sources to understand previous and current land uses.
- To describe the subject site's physical and environmental features to understand potential pathways and receptors.
- To establish under the NESCS whether it is more likely than not that an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, or has been, undertaken on the site.
- To assess whether there is any risk to potential receptors that would warrant further investigation.

3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Obtaining and review of Environment Canterbury (ECan) GIS data including the Listed Land Use Register (LLUR).
- Search of Land Information New Zealand (LINZ) orchard database.
- Review of relevant historical aerial photographs.
- Review of relevant historical certificates of title (CTs).
- Review of Christchurch City Council (CCC) property files.
- Site inspection.
- Preparation of this report in accordance with MfE guidelines.

4 Site Identification

The subject of this investigation is located at 64, 86 and 94 Barters Road in Templeton, Canterbury, from herein referred to as 'the site'. **Table 1** below outlines the key details of the site, also shown in **Figure 1** below.

Table 1 – Site Details

Site Address	Legal Description	Land Area
64 Barters Road	Lot 2 DP 38418	2.16ha
86 Barters Road	Lot 1 DP 38418	9.59ha
94 Barters Road	Lot 7 DP 23834	2.91ha
Total:		14.66ha



Figure 1 – Location Plan

5 Proposed Site Use

The client is currently completing due diligence as part of the purchasing process and has requested a Preliminary Site Investigation be undertaken at the site. If purchased, the site may be developed in the future. This would likely involve future subdivision of the site, change of use of the land and soil disturbance activities.

6 Site Description

6.1 Environmental Setting

Table 2 – Environmental Setting

Topography	The topography of the site is generally flat land.
Geology	The ECan GIS database describes the soils at the site as a combination of the Selwyn moderately deep loam over sand, the Selwyn deep loam over sand and the Waimakariri deep silt. Information obtained from on-site and surrounding bore logs describe on-site and surrounding soils as topsoils underlain by silts or sands, followed by gravels.
Soil Trace Elements	According to the ECan GIS database, natural concentrations of trace elements for the site are those of the 'Regional, Recent' soil group.
Groundwater	The site lies over the unconfined and semiconfined gravel aquifer system. Information obtained from on-site and surrounding bore logs shows groundwater levels are approximately 14.57-16.80m deep. The direction of groundwater flow is generally in a south-easterly direction.
Surface Water	An unnamed drain runs through the centre of the site and parallel with Barters Road.

6.2 Site Layout and Current Site Uses

The site is used for rural residential purposes. Both 64 and 94 Barters Road contain a dwelling, swimming pool, multiple sheds and vacant paddocks. 86 Barters Road contains a dwelling, sheds, animal yards and vacant paddocks.

6.3 Surrounding Land Uses

The majority of the surrounding area is used for rural residential land.

6.4 Geotechnical Investigations

At the time of writing no geotechnical investigations were available to Momentum Environmental Ltd (MEL).

7 Historical Site Use Assessment

7.1 Previous Site Ownership and Use

Historical Certificates of Title (CTs) were reviewed with the following relevant ownership information outlined below:

All Lots

28 May 1927	Nathan Clegg, a Hornby bonemiller
23 July 1937	Richard Carter, a Hornby farmer
24 October 1951	John Gerald Carter, a Templeton farmer
21 August 1959	Norman Thomas, a Christchurch farmer

08 April 1965 Leslie Gray Thomas, a Christchurch farmer

64 Barters Road

13 May 1965 Victor Douglas Clutterbuck, a Christchurch horse trainer
30 November 1971 David Alister Hiddleston, a Christchurch builder
04 May 1981 Robin Donald Adams, a Christchurch company manager
14 June 1984 Larry Raymond Bagge, a Christchurch motor vehicle dealer and Carol Morven Bagge, his wife
19 August 2022 Trent James Williams and Kelly Jane Williams

86 Barters Road

13 May 1965 Victor Douglas Clutterbuck, a Christchurch horse trainer
01 April 1974 Patrick James O'Brien, a Christchurch studmaster and Jill Margaret O'Brien, his wife
23 June 1979 Lyndsay Stuart Powell, a Christchurch married woman
15 January 1988 Grahame James Roll, engineer and Janice Margaret Roll, housewife
17 December 1996 David Francis Parris, a Christchurch barrister and solicitor and Joan Elizabeth Parris, his wife

94 Barters Road

23 June 1965 Arnold Arthur Little, a Christchurch builder
10 July 1974 Anthony Cole, drainage contractor and Valmai Kathleen Cole, his wife
26 January 1988 Howard Brent Smith, horse trainer and Carol Rose Smith, his wife
05 December 1989 George Gilbert Coles Trott, a Christchurch company director
11 July 2013 Phillip John Lister
23 October 2015 Jonathan Scott Craw and Lorna Craw

Note that some of the older information was of poor quality and difficult to follow, therefore the accuracy of the spelling of names and dates is not guaranteed. Copies of the historical CTs are included in **Appendix A**.

7.2 District Council Records

The site is currently within the Rural Urban Fringe Zone within the Christchurch District Plan.

The property files were requested from Christchurch City Council and reviewed on 27 November 2023. The following information has been summarised for each property:

64 Barters Road

- A Building Permit application to erect a dwelling, dated November 1971.
- A Building Permit application to erect an implement shed, dated February 1972. The walls of the shed are concrete block.
- A Building Permit application to erect stables, dated February 1975. The walls of the stables are concrete block.
- A Building Permit application to erect a pump house and changing shed, dated February 1977. The roof is noted as having decramastic tiles. The walls are concrete block.
- A Building Permit application to erect a garage, dated May 1982.
- A photo taken from the dwelling on the property shows it is largely clad with concrete block.

86 Barters Road

- A Building Permit application to erect a hay shed, dated October 1976. The hay shed has iron walls and a concrete floor.
- A Building Permit application for a garage, dated February 1988.
- A Land Information Memorandum (LIM) from November 2023 includes a list of buildings permits that aren't included in the property file, these are a building permit for a dwelling dated April 1965 and a building permit for stables dated May 1965.

94 Barters Road

- A Building Permit application to erect a play house, dated May 1978.
- A Building Permit application to erect a dwelling, dated July 1978. The walls are summer hill stone and the roof is decramastic tiles.
- A Building Permit application for additions to the dwelling, dated November 1987.

7.3 Regional Council Records

The ECan GIS database shows the site is not listed on the Listed Land Use Register (LLUR) as per the Hazardous Activities and Industries List (HAIL). There is one property within a 100m radius of the site listed on the ECan LLUR. SIT1425, the Templeton Country Club, located on Pound Road is listed for 'HAIL A10 – persistent pesticide bulk storage or use' and 'HAIL A17 – storage tanks or drums for fuel, chemicals or liquid waste'. The property is categorised as 'verified HAIL, not investigated'. The LLUR Statement notes that two underground fuel storage tanks are present at the property. A golf course is also present at the property from pre 1965-2011.

A full copy of the LLUR Statement is attached in **Appendix B**.

The ECan GIS database shows two active bores on 94 Barters Road and one active bore on 64 Barters Road. The bores are for domestic and stock water supply. Bores within a 100m radius of the site are also used for domestic purposes.

The ECan GIS database shows one resource consent associated with 94 Barters Road permitting the taking and use of groundwater. Resource consents associated with land within a 100m radius of the site are also for the taking and use of groundwater and the discharge of domestic wastewater to ground.

7.4 LINZ Records

The LINZ Orchard layer does not show the site, or any nearby properties as having listed orchards.

7.5 Review of Historical Aerial Photographs

A total of nine aerial photographs have been sourced from the ECan GIS database and Retrolens. Copies of the aerial photographs used are included in **Appendix C**.

Table 3 – Historical Aerial Photograph Summary

Year	64 Barters Road	86 Barters Road	94 Barters Road	Surrounding Area
1941	64 Barters Road is vacant of structures and in pasture.	A rectangular farm building is present in the western corner of the site adjacent to the Barters Road entrance. The remainder of 86 Barters Road is in pasture.	A dwelling and multiple farm buildings are present in the southern end of 94 Barters Road. The remainder of 94 Barters Road is in pasture.	The surrounding area is largely vacant, rural land.
1950	There are no significant changes to this portion of the site.	Additional structures are now present in and around the original rectangular structure.	There are no significant changes to this portion of the site.	There are no significant changes to the surrounding area.
1962	There are no significant changes to this portion of the site.	There are now four rectangular structures present, including animal yards present. There is no evidence of a dip structure within the animal yards. An access track extends from the yards to Barters Road, 94 Barters Road and to the northern paddocks.	Some of the smaller farm structures have been demolished and replaced by larger farm sheds. Two smaller domestic structures are now present to the east of the dwelling. Several trees have been felled and are present in the paddock to the north of the dwelling.	Some additional structures have been added to the rural residential properties to the north-west of the site.
1974	A dwelling is now present in the southern corner of 64 Barters Road. The remainder of 64 Barters Road is in pasture. This is consistent with the property file information showing a building permit to erect a dwelling was applied for in 1971.	The animal yards and two farm building have been demolished. A dwelling has been constructed to the north of the farmyard area. This is consistent with the property file information showing a building permit to erect a dwelling was applied for in 1965.	There are no significant changes to this portion of the site.	Rural residential development is now occurring on land to the north, south and west of the site.
1984	A row of farm buildings are present along the eastern boundary, these are likely the stables noted in the property file.	The pastoral land has been divided into individual paddocks.	The previous dwelling has been demolished and a new dwelling constructed. This is consistent with the property file information showing a building permit to erect a dwelling was applied for in 1978. The majority of farm buildings have also been demolished and a new farm building has been constructed along the southern boundary. This is likely the playhouse noted in the property file.	A horse track is present on the property to the south of the site.
1994	There are no significant changes to this portion of the site.	A garage is now present adjacent to the dwelling, this is consistent with the property file information.	There are no significant changes to this portion of the site.	There are no significant changes to the surrounding area.

2005	A swimming pool is visible to the north of the dwelling.	A small structure is present in the centre of the property within the paddocks.	A swimming pool is visible to the west of the dwelling. Some of the vegetation to the west of the farm building has been removed.	Rural residential development is now occurring on land to the east of the site.
2012	An established domestic vegetable garden is now present to the north of the dwelling.	An access track now exists to the small structure previously noted.	There are no significant changes to this portion of the site.	There are no significant changes to the surrounding area.
2020	There are no significant changes to this portion of the site.	There are no significant changes to this portion of the site. Bares patches of land exist across the paddocks, these are likely associated with stock feed out areas.	There are no significant changes to this portion of the site.	There are no significant changes to the surrounding area.

8 Site Inspection

A site inspection was undertaken on 21 November 2023 to assess the likelihood of soil contamination on the site. Site Inspection Plans detailing the structures on the site and potential sources of contamination, including those identified by the desktop portion of this investigation, are shown in **Appendix D**.

64 Barters Road

The buildings on 64 Barters Road include a dwelling, pump house/changing shed, car port, sheds and stables. The dwelling has concrete block and timber walls with a decramastic roof. The pump house/changing shed is constructed from the same materials as the dwelling. The dwelling is surrounded by established gardens including lawn, trees, a concrete patio with a swimming pool, domestic vegetable gardens and an area of fruit trees. A car port constructed from corrugated iron and timber is present to the east of the pump house/changing shed.



Photo 1 – South side of dwelling



Photo 2 – North side of dwelling, concrete patio & pool



Photo 3 – Established gardens



Photo 4 – Domestic vegetable garden



Photo 5 – Fruit trees



Photo 6 – Car port

Two cement board fences are present within the residential curtilage area. One has some broken sections. Asbestos-like fibre clusters were visible along the broken edges indicating the cement board is asbestos containing material (ACM). The broken cement board fence may pose a risk of contamination of the surrounding soils. The unbroken cement board fence is unlikely to pose a risk of contamination. Beyond the more southern ACM fence is an area of gum trees that has recently been cleared of low-level vegetation. Some concrete pieces were visible in this area. There is no evidence of former buildings or structures in this area on the historical aerial photographs so these concrete pieces are unlikely to indicate a source of contamination.



Photo 7 – Cement board fence with broken pieces



Photo 8 – Small pile of broken cement board & timber



Photo 9 – Unbroken cement board fence



Photo 10 – Concrete pieces within area of gum trees

Beyond the dwelling to the north-east are sheds and stables. The stables are constructed from concrete block, timber and iron. The implement shed at the southern end of the stables is constructed from concrete block, cement board and metal. Adjacent to the implement shed is a cement board and metal garage. Given the era of these buildings the cement board may contain asbestos. However, the cement board is not in a deteriorated state so is unlikely to pose a risk of soil contamination.

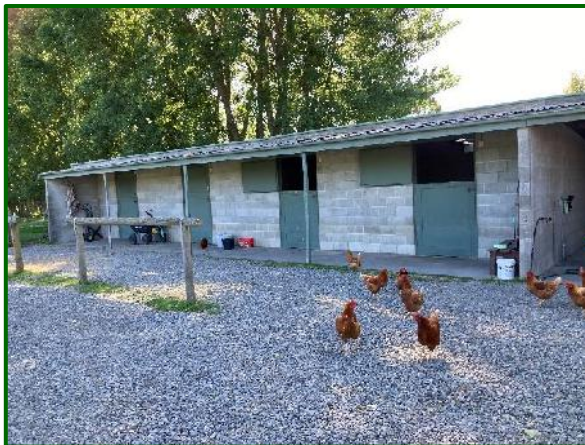


Photo 11 – Stables



Photo 12 – Implement shed and garage

At the northern end of the stables is a water tank, metal and timber hayshed and timber chicken coop. Minor storage of timber is occurring in front of the hayshed.



Photo 13 – Hayshed, chicken coop & minor storage of timber

Beyond the yard and residential areas at the southern end of the property are paddocks currently used for grazing horses, and a few sheep and cattle. No potential sources of contamination were observed within the paddocks of the property.



Photo 14 – Paddocks



Photo 15 – Solar panels & timber loading ramp

86 Barters Road

86 Barters Road is accessed by a driveway leading off Barters Road. To the north of the driveway are two stable blocks and a raised shed around a concrete yard. The buildings have painted concrete and timber walls, iron roofs and concrete floors. Historical aerial photographs indicate these buildings were constructed before 1955. Given the age of the buildings, lead-based paints may have been used on the buildings and this may have caused contamination of the surrounding soils. Items of scrap including metal, plastic and wood are being stored in two locations to the east and north of these buildings.



Photo 16 – Eastern stable block



Photo 17 – Western stable block & raised shed on right



Photo 18 – Scrap items at eastern end of sheds



Photo 19 – Scrap items north of sheds

To the south of the driveway is a paddock containing a metal & timber hayshed. The property file indicates this shed has a concrete floor. The shed is currently used to store hay. To the north of the hayshed is a green waste pile sourced from felling the trees previously located on the southern corner of the property. Between the hayshed and the green waste pile is an area with bare soils which could indicate material has previously been stored at this location. If the stored items included treated timber or agrichemicals this could have caused contamination of the underlying soils.



Photo 20 – Hayshed



Photo 21 – Green waste pile



Photo 22 – Bare soils adjacent to hayshed

At the end of the driveway is a dwelling and garage with attached games room. These buildings are clad with painted brick and timber with an iron roof. The property file indicates that the dwelling was built in

1965 and the garage/games room in 1988. Given the ages of the buildings it is considered unlikely that significant contamination from the use of lead-based paints has occurred. No suspected asbestos containing building material were observed on these buildings. To the north-east of the dwelling is a domestic vegetable garden. To the north-west of the dwelling is an established garden.



Photo 23 – Dwelling



Photo 24 – Dwelling & garden



Photo 25 – Garage



Photo 26 – Games room attached to garage



Photos 27 & 28 – Domestic vegetable garden



Beyond the yard and residential areas at the southern end of the property are paddocks currently used for grazing horses, sheep and cattle. The paddocks include two metal and timber animal shelters/sheds and a timber loading ramp. A few tyres and an empty oil drum are stored next to the more southern animal shelter/shed. A horse arena surfaced with sand and fine gravel is present on the south-east corner of the property. An earth mound lies parallel to the arena. It is considered most likely that the

material within the mound was generated when the arena was constructed and is unlikely to be contaminated.



Photo 29 – Animal shelter/shed in middle of property



Photo 30 – Southern animal shelter/shed



Photo 31 – Tyres & drum next to shed



Photo 32 – Timber loading ramp



Photo 33 – Gravel/sand horse arena



Photo 34 – Earth mound adjacent to arena

A burn area is present within a gully on the northern end of the property. Burnt scrap metal and timber items were visible within the burn area. It is considered likely that burning of material other than green waste has occurred, potentially causing contamination of the underlying soils. No other potential sources of contamination were observed within the paddocks. It is noted that the grass was very long and may have obscured smaller burn areas. However, there are no other likely burn areas indicated on the historical aerial photographs.



Photo 35 – Burn area on northernmost paddock



Photo 36 – Timber & metal visible within burnt material

94 Barters Road

The dwelling at 94 Barters Road is clad with brick and hardiplank. Given the era of the building the hardiplank may include asbestos. However, as there was no evidence of deterioration of the hardiplank it is highly unlikely to have caused contamination of the soils. The dwelling has a concrete tile roof. To the west of the dwelling is an established garden with a swimming pool and a play area. Another garden area is located to the west of the dwelling. An open drain runs along the northern boundary of the curtilage area and leads to a duck pond within trees to the north-east of the dwelling.



Photo 37 – Dwelling



Photo 38 – Garden, pool & play area



Photo 39 – Duck pond

To the south-east of the dwelling is a yard area with several concrete and timber buildings including a garage, stables, sleepouts/dwelling, and sheds. Several shipping containers (two of which are

supporting a plastic roof to protect a caravan) are present in this area. Minor storage of scrap metal is occurring at the eastern end of one of the shipping containers. Stockpiles of firewood are present adjacent to a woodshed. A timber loading ramp is present within trees towards the middle of the yard area. An aboveground storage tank (AST) is present between a timber sleepout and a shipping container. No olfactory or visual evidence of spillage from the tank was observed during the site inspection.



Photo 40 – Timber sleepout, shipping container on left



Photo 41 – AST between sleepout & shipping container



Photo 42 – Garage



Photo 43 – Shed



Photo 44 – Stables including sleepout/dwelling



Photo 43 – Sleepout/dwelling



Photo 44 – Woodshed



Photo 45 – Firewood stockpiles



Photo 46 – Water tank & pump shed



Photo 47 – Timber loading ramp



Photo 48 – Shipping container in grass yard area



Photo 49 – Storage of scrap metal

Beyond the residential and yard areas are paddocks currently used to graze a few cattle and pigs. A burn area is present within a paddock on the eastern side of the property. Only green waste was visible within the burn area at the time of the site inspection. However, historical burning of non-green waste cannot be ruled out. Balage is being stored near the northern boundary of the property along with a few wooden pallets and two tyres. A bare area of soil was present in the largest of the paddocks, on the western side of the property. This was located within a depression and there was no evidence of burning. It is considered most likely that the bare soils are due to water saturation rather than storage of materials or burning. A bund of soils is present along the western side of this paddock. Demolition debris was visible with a pile of bricks at the southern end of the bund and embedded concrete pieces visible along

the length of the bund. It is not known where the soils were sourced from, therefore, they may be contaminated.



Photo 50 – Burn area



Photo 51 – Balage, two tyres & few pallets



Photo 52 – Bare area



Photo 53 – Bund



Photo 54 – Bricks visible within bund



Photo 55 – Concrete pieces visible within bund

9 Risk Assessment

9.1 Potential HAIL Uses Identified

The Hazardous Activities and Industries List (HAIL) compiled by The Ministry for the Environment include the following categories (*in italics*) that could be associated with the historical uses of the site with a summary of the risk of these activities having been carried out on the site.

A – Chemical manufacture, application and bulk storage

8. Livestock dip or spray race operations

Animal yards are present on 86 Barters Road in the 1962 historical aerial photograph. The use of the yards for sheep dipping or operation of a spray race cannot be discounted.

Contaminants of concern include heavy metals and organochlorine pesticides (OCPs).

10. Persistent pesticide bulk storage or use, including sport turfs, market gardens, orchards, glasshouses or spray sheds

For its known history, the pastoral areas of the site have been used for pastoral farming activities. The normal use of fertilisers and pastoral weed controls associated with these farming activities is unlikely to have caused soil contamination that would pose a risk to human health.

Based on historical aerial photographs farm structures have been present on both 86 and 94 Barters Road from as early as 1941. The use of these structures for storage and mixing of persistent pesticides cannot be discounted.

Contaminants of concern include heavy metals and OCPs.

17. Storage tanks or drums for fuels, chemicals or liquid waste.

An AST is present at 94 Barters Road. The AST was rusted and in a deteriorated condition. While no olfactory or visual evidence of spillage from the tank was observed during the site inspection, contamination of the underlying soils cannot be discounted.

Contaminants of concern include heavy metals and hydrocarbons.

E – Mineral extraction, refining and reprocessing, storage and use

1. Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition

Two cement board fences are present within the residential curtilage area of 64 Barters Road. Asbestos-like fibres were visible along the broken edges of one fence indicating the cement board is asbestos containing material (ACM). The broken cement board fence may pose a risk of contamination of the surrounding soils.

The contaminant of concern is asbestos.

Buildings with ACM are present at 64 Barters Road and 94 Barters Road. As the buildings are in a good condition the risk of asbestos contamination of the surrounding soils can be discounted.

Decramastic roofs are present on both the dwelling and pump house/changing shed at 64 Barters Road. The decramastic roofs were in a slightly deteriorated condition however the surfaces surrounding the structures were concrete or gravel and therefore the risk of asbestos contamination of the underlying soils is low. The property file information for 94 Barters Road noted a decramastic roof was to be used on the dwelling. The site inspection noted that the roof was a concrete tile roof.

H – Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

One property within a 100m radius of the site is listed on the ECan LLUR. Based on the information included in the LLUR Statement, it is considered highly unlikely that the site has been subject to the migration of contaminants from this property in sufficient quantity to pose a risk to human health or the environment.

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

Based on historical aerial photographs structures are present on both 86 and 94 Barters Road from as early as 1941. Based on the era of construction it is highly likely that lead-based paint products have been used and any natural deterioration or intentional removal over time may have caused contamination of the surrounding soils.

A burn area is present within a gully on the northern end 86 Barters Road. Burnt scrap metal and timber items were visible within the burn area. A burn area is also present within a paddock at 94 Barters Road. It is considered likely that burning of material other than green waste has occurred, potentially causing contamination of the underlying soils.

Items of scrap including metal, plastic and wood are being stored in two locations at 86 Barters Road. The storage of such materials can cause contamination of the underlying soils. An area with bare soils is also present at 86 Barters Road. The bare soils could indicate material has previously been stored at this location. If the stored items included treated timber or agrichemicals this could have caused contamination of the underlying soils.

A bund of soil is present within a paddock at 94 Barters Road. Demolition debris was visible with a pile of bricks at the southern end of the bund and embedded concrete pieces visible along the length of the bund. It is not known where the soils were sourced from, therefore, they may be contaminated.

Contaminants of concern include heavy metals and asbestos.

9.2 NESCS Regulation 6(3) Probability Assessment

In terms of the NESCS, Regulation 5(7) states that land is considered to be covered if an activity or industry described in the HAIL is being undertaken; has been undertaken; or is more likely than not to have been undertaken on it. Regulation 6 describes the methods for determining this. Method 6(3) is to rely on a Preliminary Site Investigation. The NESCS Users Guide indicates the test for 'more likely than not' is that there is more than a 50 percent likelihood of the HAIL having occurred. The table below states the likelihood of each HAIL identified:

Table 4 – NESCS Probability Assessment

HAIL Category	6(3)a – Is being undertaken	6(3)b – has been undertaken	6(3)c – likelihood of having been undertaken (if not confirmed)
HAIL A8 – livestock dip or spray race	-	-	More likely than not
HAIL A10 – persistent pesticide bulk storage or use	-	-	More likely than not
HAIL A17 – persistent pesticide bulk storage or use	Yes	-	-

HAIL E1 – asbestos in a deteriorated condition	Yes	-	-
HAIL H – migration of hazardous substances	-	-	Highly unlikely
HAIL I – any other land	Yes	-	More likely than not

9.3 Conceptual Site Model

The following conceptual site model (CSM) indicates potentially complete exposure pathways associated with the identified risks at the site.

Table 5 – Preliminary Conceptual Site Model

Preliminary Conceptual Site Model			
Source	Pathways		Receptor/Exposure Pathway Status
<ul style="list-style-type: none"> Potential heavy metal and OCP contamination from a likely livestock dip or spray race operation at 86 Barters Road. 	Human	Dermal contact, ingestion and inhalation through soil contact	Potentially complete exposure pathway for future land users.
			Potentially complete exposure pathway for workers involved in soil disturbance activities at the site
<ul style="list-style-type: none"> Potential heavy metal and OCP contamination from storage and mixing of areas within farm structures at 86 and 94 Barters Road. Potential heavy metal and hydrocarbon contamination from a rusted AST at 94 Barters Road. Potential asbestos contamination from a broken ACM fence at 64 Barters Road. Potential heavy metal contamination from historical buildings at 86 and 94 Barters Road. Potential heavy metal and asbestos contamination from storage and burn areas at 86 and 94 Barters Road. Potential heavy metal and asbestos contamination from a bund of soil from an unknown source at 94 Barters Road. 	Ecological	Infiltration through soils to groundwater	Likely incomplete pathway due to depth to groundwater.
		Surface runoff to waterways	Pathway to surface water is potentially complete if significant soil mobilisation occurs and sediments enter the on-site and nearby drains.

Based on the results of the NESCS assessment and conceptual site model, it is recommended that further investigation of the risk areas be undertaken in the form of a Detailed Site Investigation prior to development of the site.

10 Conclusion

This PSI has shown the site has been used for rural and rural residential activities for its known history. Each of the individual properties within the site currently contain a dwelling, sheds and pastoral land used for grazing animals. The PSI has identified the following potential sources of contamination:

- A potential livestock dip or spray race operation in animal yards visible in the 1962 aerial photograph at 86 Barters Road (HAIL A8).
- The potential use of farm structures for storage and mixing of persistent pesticides on both 86 and 94 Barters Road from as early as 1941 (HAIL A10).
- A rusted aboveground fuel storage tank present at 94 Barters Road (HAIL A17).
- A broken fence potentially containing asbestos at 64 Barters Road (HAIL E1).
- Historical structures both existing and demolished posing a risk of lead contamination in surrounding soils at 86 and 94 Barters Road (HAIL I).
- Burn areas at 86 and 94 Barters Road (HAIL I).
- Storage areas including items of scrap such as metal, plastic and wood at 86 Barters Road (HAIL I).
- A bund of soils containing demolition debris at 94 Barters Road (HAIL I).

There may be a risk to human health from contaminated soils in the above risk areas at the site. These risk areas are shown in dashed red on the Site Inspection Plans attached in **Appendix D**. It is recommended that further investigation of the risk areas be undertaken in the form of a Detailed Site Investigation prior to development.

In terms of planning status at the time of writing of this report, the NESCS does apply to the site. Future activities that trigger the NESCS may require resource consent.

11 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the site, Momentum Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

No part of this report may be reproduced, distributed, publicly displayed, or made into a derivative work without the permission of Momentum Environmental Ltd, other than the distribution in its entirety for the purposes it is intended.

Appendix A – Historical Certificates of Title

Reference:
Prior C/T. 394/166

Transfer No.
N/C. Order No. 649816



Land and Deeds 69

CANCELLED

REGISTER

4C/379

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 11 acres 1 roods 31 perches or thereabouts, being Lot 3 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas
Clutterbuck of Christchurch Horse
Trainer - 13.5.1965 at 9.38a.m.

[Signature]
A.L.R.

Mortgage 652284 to The New Zealand
Insurance Company Limited - 13.5.1965
at 9.39a.m.

[Signature]
A.L.R.

Mortgage 652285 to *[illegible]* Foley
13.5.1965 at 9.42a.m.

DISCHARGED
[Signature]
A.L.R.

PLAN No. 24156 DEPOSITED 1.10.1965

N.C.O. 670332 } Cancelled and C's.T.
- 8/12/1965 } 5C/28 and 29 issued
for Lot 1 and the part
Lot 3 D.P. 24156
herein respectively

[Signature]
A.L.R.

CANCELLED : DUPLICATE DESTROYED

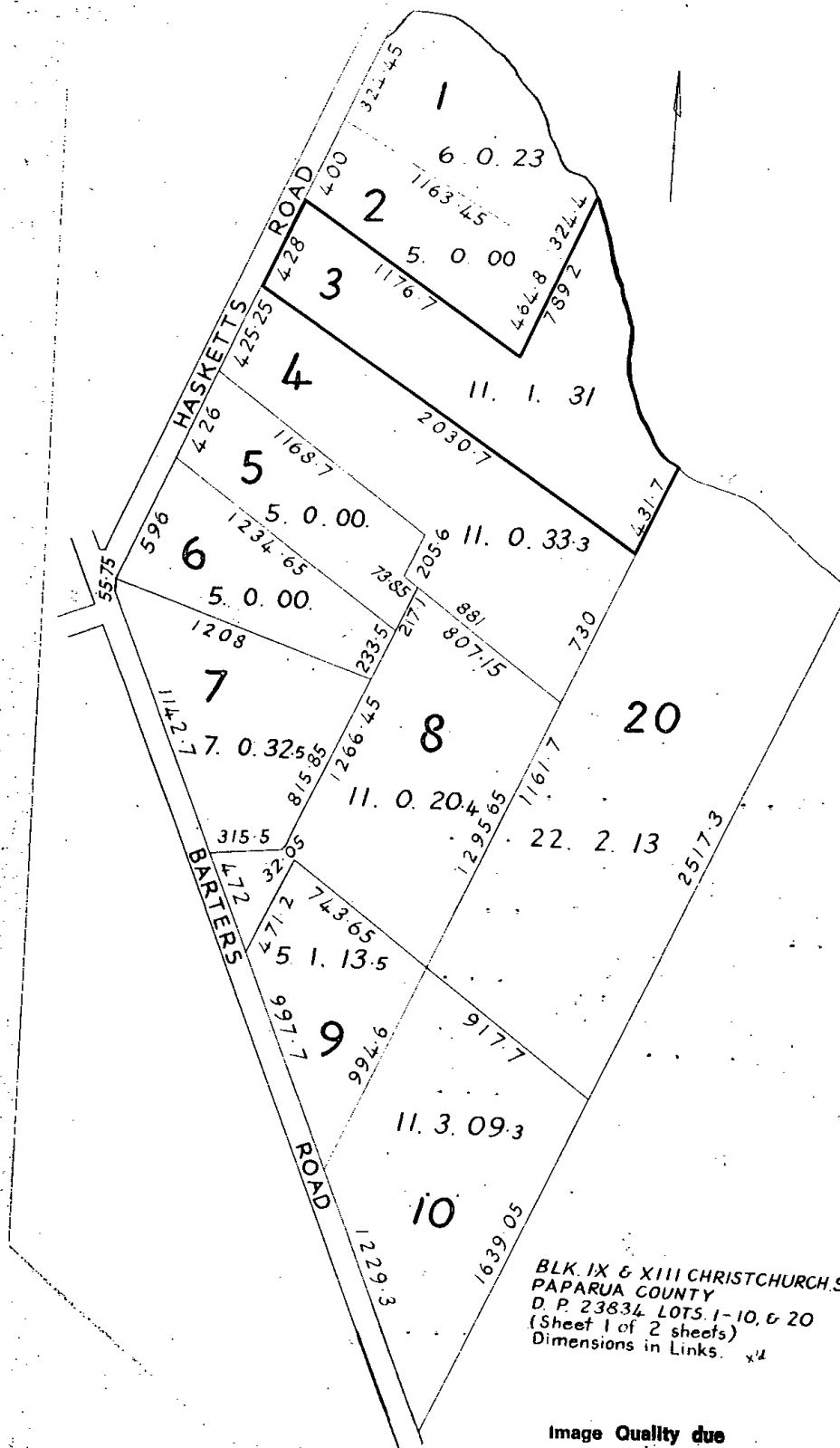
For diagram see back

Scale: 1 inch =

30,00/12/61-48318 W

Register copy for L. & D. 69, 71, 72

No. 4C/379



BLK. IX & XIII CHRISTCHURCH.S.D
 PAPARUA COUNTY
 D. P. 23834. LOTS. 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links. x/4

Image Quality due
 to Condition
 of Original



Reference:
Prior C/T. 394/166

Transfer No.
N/C. Order No. 649816



Land and Deeds 69

REGISTER

PART CANCELLED

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

No. 4C/380

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 11 acres 0 roods 33.3 perches or thereabouts being Lot 4 on Deposited Plan 24156 part of Rural Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas
Clutterbuck of Christchurch Horse
Trainer - 13.5.1965 at 9.38a.m.

N.C.O. 670332 } Cancelled and C.T.
- 8/12/1965 } 50/29 issued for
the part Lot 3 D.P.
24156 herein

[Signature]
A.L.R.

[Signature]
A.L.R.

Mortgage 652284 to The New Zealand
Insurance Company Limited - 13.5.1965
at 9.39a.m.

CANCELLED : DUPLICATE DESTROYED

[Signature]
A.L.R.

Mortgage 652285 to Barbara Foley
13.5.1965 at 9.40a.m.

DISCHARGED
[Signature]
A.L.R.

PLAN No. 24156 DEPOSITED 1.10.1965

Discharge of Mortgage 652284 as to Lot
2 D.P. 24156 - 24/11/1965 at 9.25a.m.

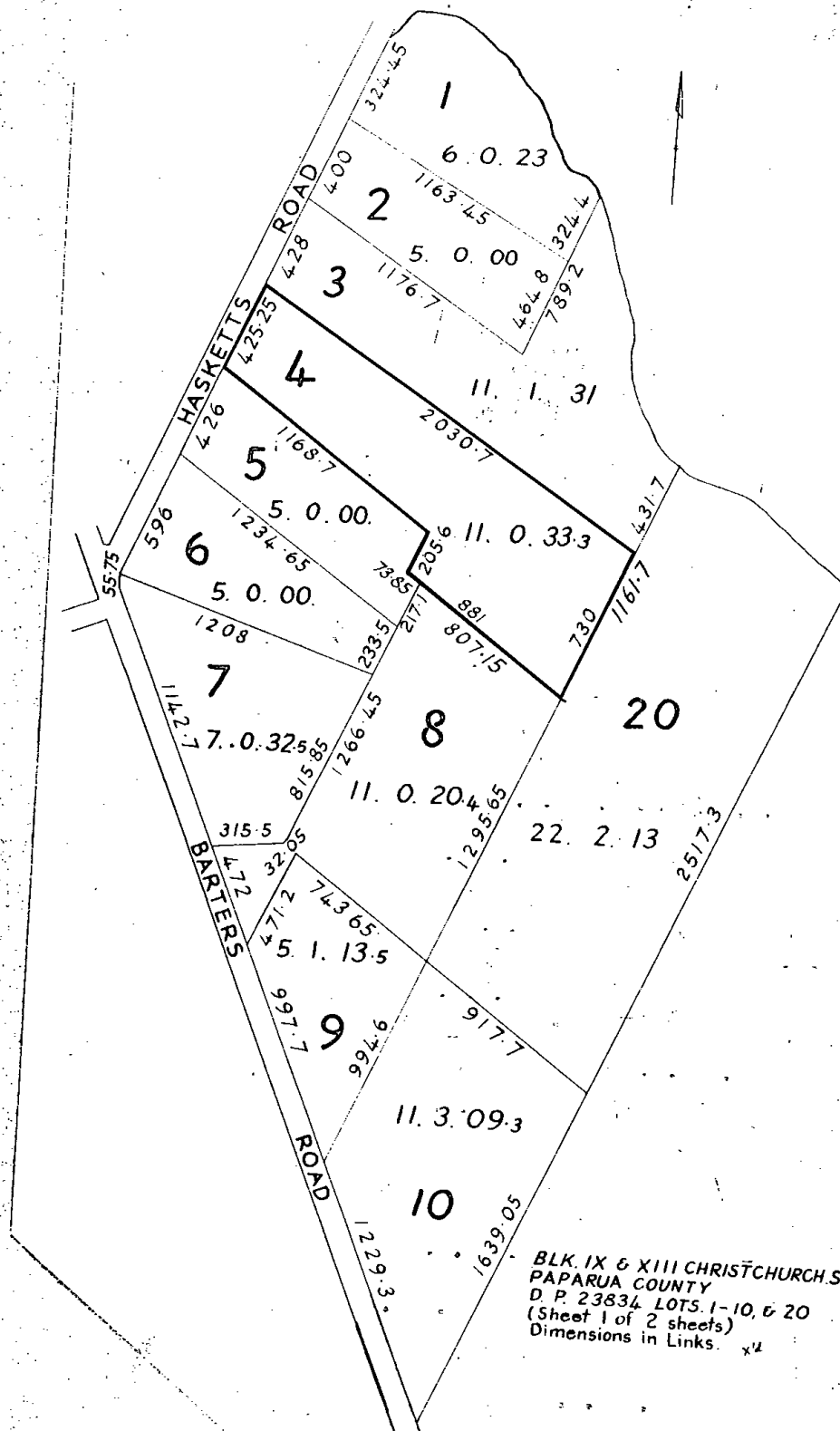
[Signature]
A.L.R.

Transfer 669002 of Lot 2 D.P. 24156 to
Rodger Ian Stark and Judith Ann Stark
- 24/11/1965 at 9.27a.m.
5B/4280

[Signature]
A.L.R.

PART CANCELLED
For diagram see back
Scale: 1 inch =

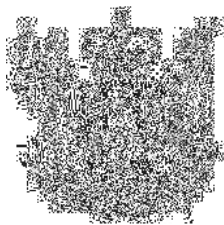
4C/380



BLK. IX & XIII CHRISTCHURCH S.D
 PAPARUA COUNTY
 D. P. 23834 LOTS. 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links. x2

Image Quality due
 to Condition
 of Original





RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB4C/383**
Land Registration District **Canterbury**
Date Issued 08 April 1965

Prior References
CB394/166

Estate Fee Simple
Area 2.9150 hectares more or less
Legal Description Lot 7 Deposited Plan 23834

Original Registered Owners
George Gilbert Coles Trott

Interests

A474704.5 Mortgage to ASB Bank Limited - 19.9.2000 at 2:28 pm
5356230.1 Mortgage to S.H. Lock (NZ) Limited - 26.9.2002 at 2:13 pm
6905303.1 Mortgage to Crestor Mortgage Company Limited - 14.6.2006 at 9:00 am
6923975.1 Mortgage to Leaseco Finance Limited - 28.6.2006 at 9:00 am
7733250.1 Discharge of Mortgage 6905303.1 - 2.4.2008 at 11:16 am
7733250.2 Discharge of Mortgage 6923975.1 - 2.4.2008 at 11:16 am
7792506.1 Variation of Mortgage A474704.5 - 22.4.2008 at 9:00 am
7946737.1 Mortgage to Crestor Credit Company Limited - 25.9.2008 at 9:00 am
7978649.1 Discharge of Mortgage 7946737.1 - 28.10.2008 at 9:00 am
8102623.1 Discharge of Mortgage 5356230.1 - 16.3.2009 at 9:20 am
8857745.1 Variation of Mortgage A474704.5 - 14.9.2011 at 5:05 pm
8891023.1 CHARGING ORDER DATED 29.9.2011 BETWEEN GEORGE GILBERT COLES TROTT AND VFL LIMITED - 18.10.2011 at 7:00 am
9452086.1 Discharge of Charging Order 8891023.1 - 11.7.2013 at 4:47 pm
9452086.2 Discharge of Mortgage A474704.5 - 11.7.2013 at 4:47 pm
9452086.3 Transfer to Phillip John Lister - 11.7.2013 at 4:47 pm
9452086.4 Mortgage to ANZ Bank New Zealand Limited - 11.7.2013 at 4:47 pm
10202696.1 Discharge of Mortgage 9452086.4 - 23.10.2015 at 4:21 pm
10202696.3 Transfer to Jonathan Scott Craw and Lorna Craw - 23.10.2015 at 4:21 pm
10202696.4 Mortgage to ANZ Bank New Zealand Limited - 23.10.2015 at 4:21 pm

Reference:
Prior G/T. 394/166

Transfer No.
N/C. Order No. 649316



Land and Deeds 69

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 7 acres 0 roods 32.5 perches or thereabouts being Lot 7 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 655959 to Margaret Elizabeth Jamieson of Christchurch Married Woman - 23.6.1965 at 2.56p.m.

Transmission 753/1 to Lorna Merle Little of Templeton, Widow as Administrator - 10.7.1974 at 10.49 a.m.

Transfer 655960 to Arnold Arthur Little of Christchurch Builder - 23.6.1965 at 2.57p.m.

Transmission 753/3 Transfer Robert Anthony Cole of Christchurch, Drainage Contractor and Valmai Kathleen Cole his wife - 10.7.1974 at 10.50 a.m.

Mortgage 659446 James Eric Tyson to Patricia Ethel Frances Wyles and to Gordon Alison Guy Connell in shares 3.8.1965 at 11.50 a.m.

Mortgage 5817/1 to Pappill Hadfield & Aldous Solicitors Nominee Company Limited 10.32 a.m.

Mortgage 659447 to Pappill Hadfield & Aldous Solicitors Nominee Company Limited 3.8.1965 at 11.50 a.m.

No. 26835/1 Settled under the Joint Family Hoses Act 1964 on Robert Anthony Cole and Valmai Kathleen Cole both abovenamed - 27.2.1975 at 1.34 p.m.

Mortgage 659448 to Pappill Hadfield & Aldous Solicitors Nominee Company Limited 3.8.1965 at 11.50 a.m.

No. 119847/1 Change of Name of the mortgagee under mortgage No. 5817/1 to Pappill Hadfield & Aldous Solicitors Nominee Company Limited 8.3.1977 at 11.3 a.m.

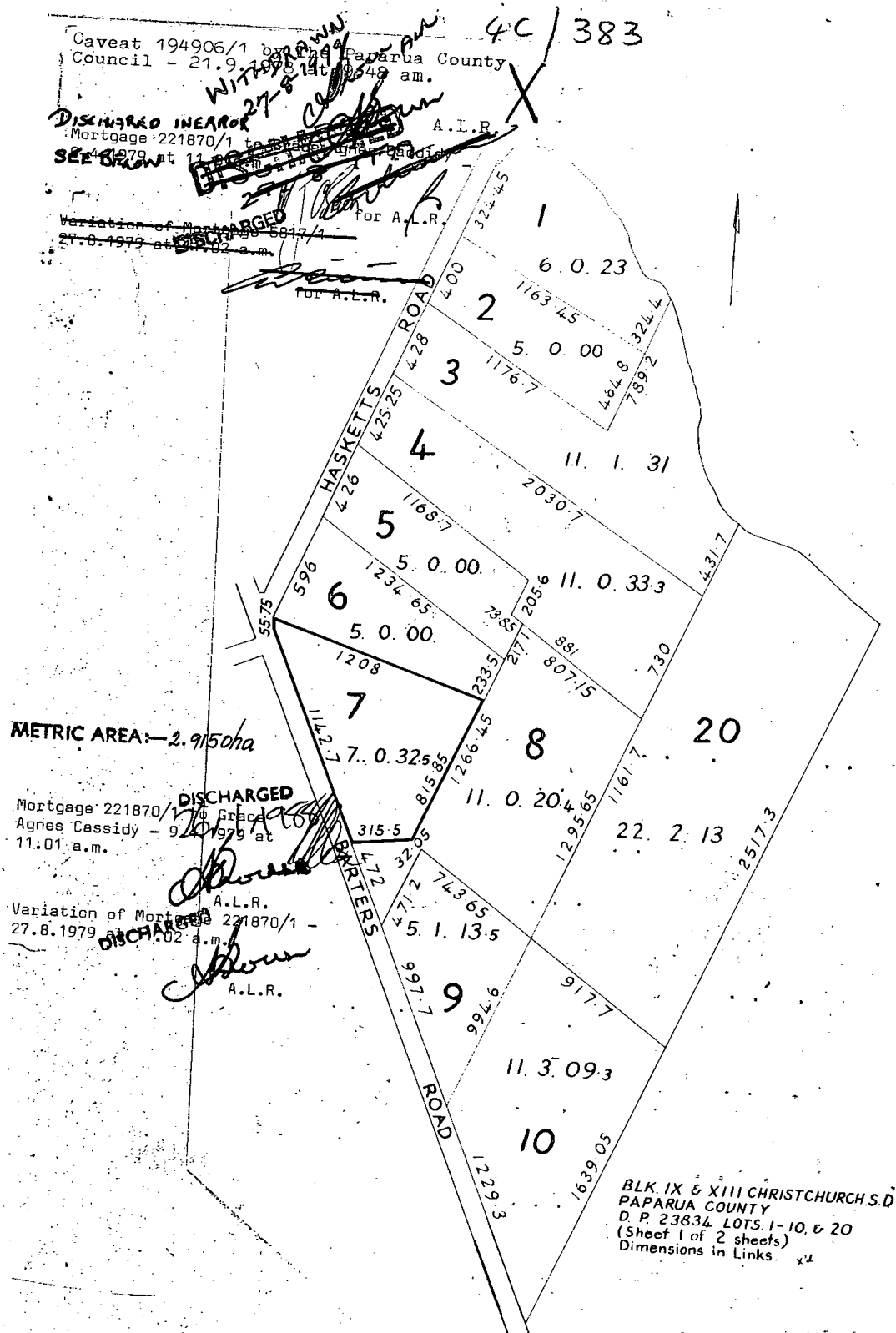
Variation of mortgage 659446 - 9/10/1969 at 10.15 a.m.

For diagram see back

Scale: 1 inch =

No. 4C/383

Register copy for L. & D. 69, 71, 72



4C/383

Transmission 722508/1 to Geoffrey
Peter Philp Cone and Thomas David
Anderson, both of Christchurch,
Solicitors as Executors -
26.1.1988 at 10.10am

[Signature]
for A.L.R.

Transfer 722508/3 to Howard Brent
Smith of Christchurch, Horse
Trainer and Carol Rose Smith
his wife - 26.1.1988 at 10.10am

[Signature]
for A.L.R.

Mortgage 756137/1 to Countrywide Banking
Corporation Limited - 26.1.1988 at 11.22am

[Signature]
for A.L.R.

Transfer 841634/2 to George Gilbert Coles
Trott of Christchurch, Company Director
- 5.12.1989 at 11.32am

[Signature]
for A.L.R.

Mortgage 841634/3 to Sadie Trott and Kenneth
William Walton and George Gilbert Coles
Trott - 5.12.1989 at 11.32am

[Signature]
for A.L.R.

Mortgage 922121/1 to The National Bank of
New Zealand Limited - 26.12.1991 at 10.07am

[Signature]
for A.L.R.

Transmission A77262/1 of Mortgage 841634/3
to Sadie Trott and George Gilbert Coles
Trott as survivors - 20.10.1993 at 11.31am

[Signature]
for A.L.R.

Variation of Mortgage 922121/1
at 11.31am

[Signature]
for A.L.R.

No. A77262/3 Memorandum of Priority making
mortgages 922121/1 and 841634/3 first and
second mortgages respectively - 20.10.1993
at 11.31am

[Signature]
for A.L.R.

CAVEAT A118066/1 BY RENB HOLDINGS LIMITED
- 15.6.1994 at 11.30am

[Signature]
for A.L.R.

Variation of Mortgage 922121/1 - 6.4.1995 at
11.25am

[Signature]
for A.L.R.

REGISTER

X CAVEAT A189016/1 BY REBBY CENTRE LIMITED
- 15.8.1995 at 12.24pm

[Signature]
for A.L.R.
Variation of Mortgage 922121/1 - 26.7.1996
at 12.05pm

[Signature]
for A.L.R.

A474704.5 Mortgage to ASB Bank
Limited - 19.9.2000 at 2.28

[Signature]
for RGL

Reference:
Prior C/T. 394/166

Land and Deeds 69

Transfer No.
N/C. Order No. 649816



REGISTER

CANCELLED

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury.

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 11 acres 0 roods situated in Block XIII of the Christchurch Survey District 20.4 perches or thereabouts/being Lot 8 on Deposited Plan 23834 part of Rural

Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas
Clutterbuck of Christchurch Horse
Trainer - 13.5.1965 at 9.38 a.m.

[Signature]
A.L.R.

Mortgage 652284 to The New Zealand
Insurance Company Limited - 13.5.1965
at 9.39 a.m.

[Signature]
A.L.R.

Mortgage 652285 to Bank of New Zealand
13.5.1965 at 9.40 a.m.

[Signature]
A.L.R.

PLAN No. 24156 DEPOSITED 1.10.1965

N.C.O. 670332 } Cancelled and C.T.
- 8/12/1965 } 5C/29 issued for the
part Lot 3 D.P. 24156
herein

[Signature]
A.L.R.

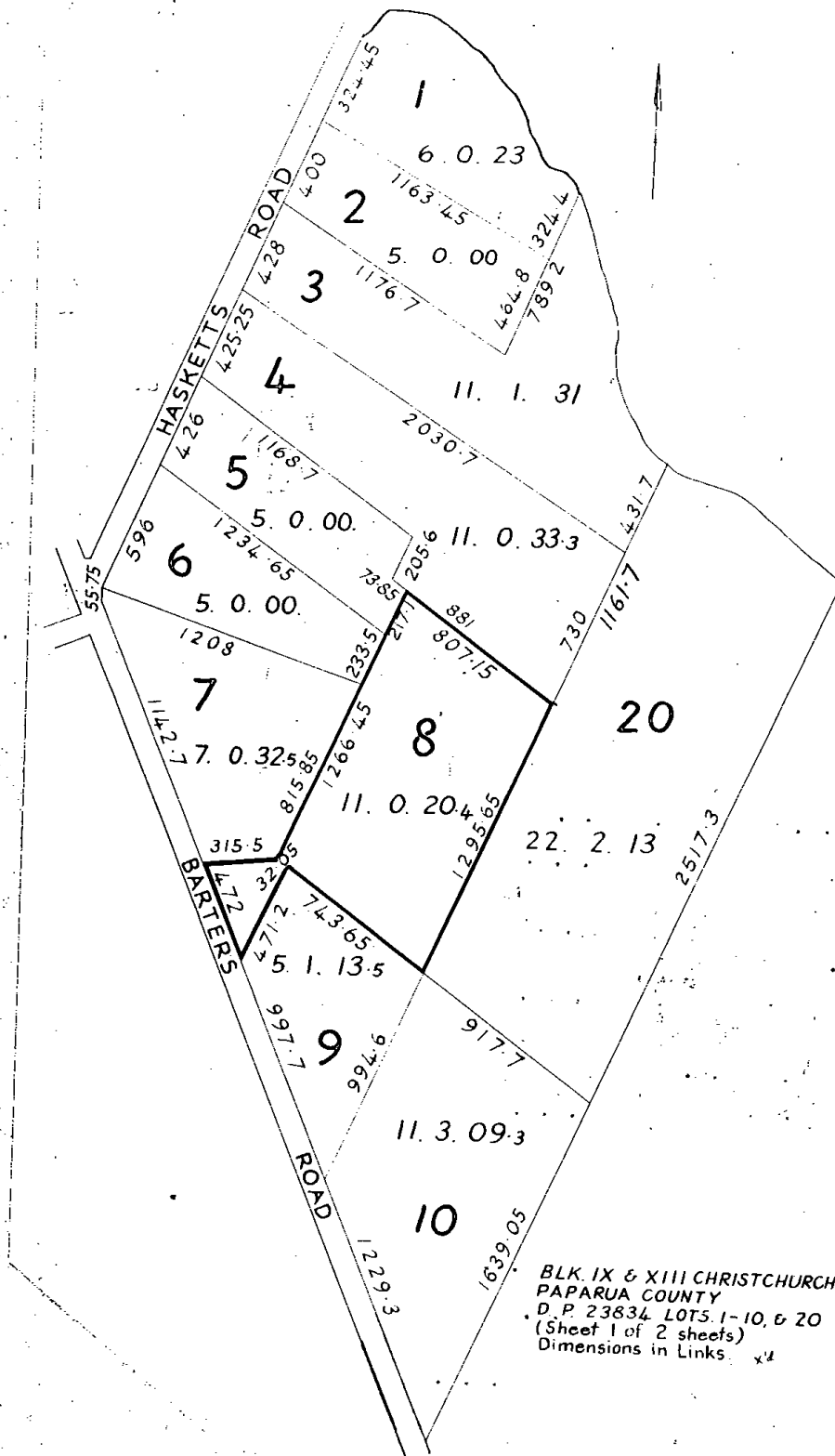
CANCELLED.: DUPLICATE DESTROYED

For diagram see back

Scale: 1 inch =

4C/384

No. 4C/384



BLK. IX & XIII CHRISTCHURCH.S.D.
 PAPARUA COUNTY
 D. P. 23834 LOTS 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links.

Image Quality due
 to Condition
 of Original



Reference:
Prior C/T. 394/166

Transfer No.
N/G. Order No. 649816

Land and Deeds 69



CANCELLED REGISTER

4C/385

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer.

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 5 acres 1 roods 13.5 perches or thereabouts, being Lot 9 on Deposited Plan 23834 part of Rural

Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas Clutterbuck of Christchurch Horse Trainer - 13.5.1965 at 9.38 a.m.

A.L.R.

Mortgage 652284 to The New Zealand Insurance Company Limited - 13.5.1965 at 9.39 a.m.

A.L.R.

Mortgage 652285 to Robert Folger - 13.5.1965 at 9.40 a.m.

A.L.R.

Mortgage 696814 to Kevin John McMenamin, Peter Henry Thorwald Alpers and James Rutherford Williams - 30.11.1966 at 2.30 p.m.

A.L.R.

Variation of Mortgage 696814 - 7/11/1967 at 9 a.m.

DISCHARGED

A.L.R.

Transfer 834371 of Mortgage 696814 to Peter Henry Thorwald Alpers - 18/6/1971 at 10.26 a.m.

A.L.R.

Transfer 850729 to David Alister Hiddleston of Christchurch, Builder - 30/11/1971 at 11.55 a.m.

A.L.R.

Mortgage 850730 to Pauline Ellwood, to Nora Nelson Walker and to William Ronald Carson and Edna May Carson in shares - 30/11/1971 at 11.55 a.m.

A.L.R.

Variation of Mortgage 696814 - 30/11/1971 at 11.55 a.m.

A.L.R.

X Caveat 851145 by W. J. L. in Timber & Hardware Co. Limited - 12/12/1971 at 12.18 p.m.

A.L.R.

For diagram: see back

Scale: 1 inch =

OVER

30,00/12/61-48318 W

Register copy for L. & D. 69, 71, 72

No. 4C/385

Mortgage 867785 to Pauline Ellwood, to Nora Nelson Waller and to William Ronald Carson and Edna May Waller, Carson, to Eileen Doris Newton, James Trevor Michaelis, Dorothy Joyce Michaelis and Hubert de Rie Fleisher and to Leonard George Kimber and Rosaleen Kimber in shares - 22/5/1972 at 2.15 p.m. (Caveator under Caveat 851145 consenting)

Variation of Mortgage 867785- (Caveator under Caveat 851145 consenting) 10/7/1973 at 2.30 p.m.

Variation of Mortgage 867785 -28.10.1975 at 9.10 a.m.

Mortgage 86666/3 to Collins Limited - 28.10.1975 at 9.10 a.m.

Transmission 99314/1 of the share of Leonard George Kimber and Rosaleen Kimber in Mortgage 867785 to Rosaleen Kimber as Survivor - 27.9.1976 at 9.26 a.m.

Mortgage 102588/3 to Pauline Ellwood, to Nora Nelson Waller, to William Ronald Carson and Edna May Carson, to Eileen Doris Newton, James Trevor Michaelis, Dorothy Joyce Michaelis and Hubert de Rie Fleisher, to Marion Inwood Hawke, Brian Leonard Hawke and Hubert de Rie Fleisher, to Tennant Russell Smellie and to Rosaleen Kimber in shares - 20.10.1976 at 10.16 a.m.

No. 135162/1 Evidence of the marriage between Rosaleen Kimber one of the Mortgages under Mortgage 102588/3 to James Ernest Standing retired of Christchurch - 22.6.1977 at 9.47 a.m.

No. 218060/3 Settling the Lot 2 DP 38418 herein under the Joint Family Homes Act 1964 on David Alistair Hiddleston abovenamed and Marie Patricia Hiddleston his wife - produced 16.3.1979 at 9.38 a.m. and entered 23.6.1979 at 9.00 a.m.

Transfer 218060/4 of the part Lot DP 38418 herein to Lyndsay Stuart Powell produced 16.3.1979 at 9.38 a.m. and entered 23.6.1979 at 9.00 a.m. CT 20A/840 issued CT 20A/841 issued for Lot 2 DP 38418

CANCELLED
DUPLICATE DESTROYED

BLK. IX & XIII CHRISTCHURCH S.D
PAPARUA COUNTY
D.P. 23834 LOTS 1-10, & 20
(Sheet 1 of 2 sheets)
Dimensions in Links.

METRIC AREA - 2.1587ha

Image Quality due
to Condition
of Original

Reference: 4C/379, 380
Prior C/T. and 384
Transfer No.
N/C. Order No. 670332



Land and Deeds 69

REGISTER

CANCELLED

No. 5C/129

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of December one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

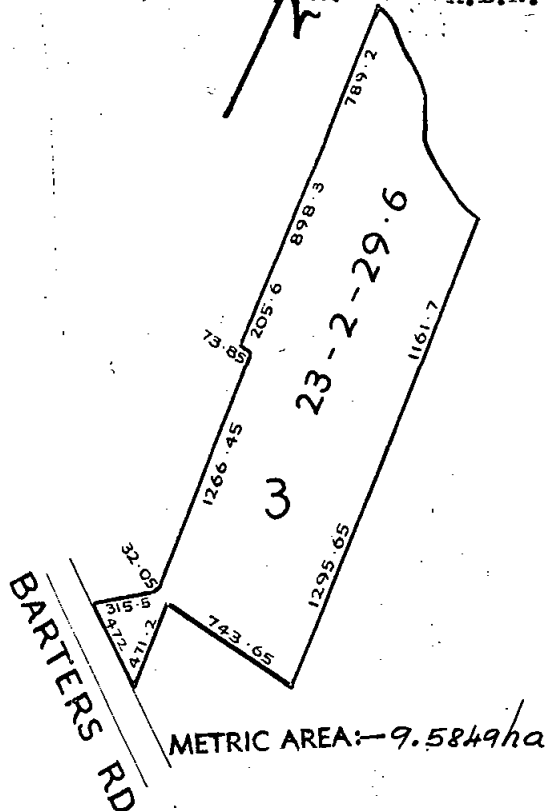
WITNESSETH that VICTOR DOUGLAS CLUTTERBUCK of Christchurch Horse Trainer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 25 acres 2 rods 29.6 perches or thereabouts situated in Blocks IX and XIII Christchurch Survey District being Lot 3 on Deposited Plan No. 24156 part Rural Section 2810

Image Quality due
to Condition
of Original

Mortgage 652284 to the New Zealand
Insurance Company Limited - 13/5/1965
at 9.39a.m.

DISCHARGED



Scale: 1 inch = 8 chains



Assistant Land Registrar

Mortgage 696814 to John
McMenamin, Peter Henry Alpers
and Ruth Ford
Williams - 11/1/1966 at 2.30p.m.

Variation of Mortgage 696814 -
7/11/1967 at 1.35 a.m.

Transfer 834371 of Mortgage 696814
to Peter Henry Oswald Alpers -
18/6/1971 at 1.35 a.m.

Variation of Mortgage 696814 -
30/11/1971 at 1.35 a.m.

Transfer 919165 of Mortgage 696814
to Doris Mary Peckey - 16/7/1973
at 2.03 p.m.

Caveat No. 923201 by Peter James
O'Brien of Christchurch and his wife -
27/8/1973 at 11.22 a.m.

OVER

15,000/5/65-65-100 VV

Mortgage 931939 to Gough Clark &
Bisphan Securities Limited
15.10.1973 at 2.30 p.m. (Caveator under
Caveat 925201, consenting) A.L.R.

Transfer 952415 to Patrick James O'Brien
of Christchurch, Studmaster and Jill Margaret
O'Brien his wife - 1.4.1974 at 10.10 a.m.

A.L.R.

Transfer 952416 to Lyndsay Stuart Powell of
Christchurch, Married Woman - 1.4.1974 at
10.10 a.m.

A.L.R.

FLAT PLAN No. 38418 DEPOSITED 27/9/1976

Transfer 218060/2 of the part Lot 2 DP 38418 herein
to David Alister Hiddleston - 16.3.1979 at 9.38 a.m.

A.L.R.

~~No. 218060/3 Settling the part Lot 2 DP 38418 herein
under the Joint Family Homes Act 1964 on David Alister
Hiddleston and Marie Patricia Hiddleston his wife
produced 16.3.1979 at 9.38 a.m. and entered
23.6.1979 at 9.00 a.m.~~

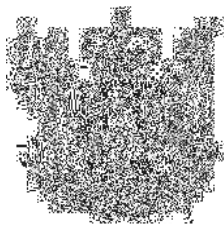
A.L.R.

Transfer 218060/4) Cancelled and new C_ST 20A/840 and 841
prod. 16.3.1979) issued for Lots 1 and 2 DP 38418
ent. 23.6.1979

A.L.R.

CANCELLED
DUPLICATE DESTROYED





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB20A/840**
Land Registration District **Canterbury**
Date Issued 23 June 1979

Prior References
CB4C/385 CB5C/29

Estate Fee Simple
Area 9.5850 hectares more or less
Legal Description Lot 1 Deposited Plan 38418

Original Registered Owners
David Francis Parris and Joan Elizabeth Parris

Interests

A306368.2 Mortgage to The National Bank of New Zealand Limited - 7.7.1997 at 3.40 pm
7304213.1 Variation of Mortgage A306368.2 - 2.4.2007 at 9:00 am
9924301.1 Discharge of Mortgage A306368.2 - 11.12.2014 at 4:59 pm
9924301.2 Mortgage to Westpac New Zealand Limited - 11.12.2014 at 4:59 pm

References

Prior C/T 5C/29, 4C/385

Transfer No. 218060/3

N/C. Order No.

Land and Deeds 69



REGISTER

No. 20A/840

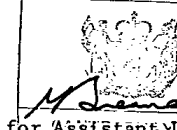
CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 23rd day of June one thousand nine hundred and seventy-nine under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that LYNDSAY STUART POWELL of Christchurch, Married Woman —

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 9.5850 hectares or thereabouts situated in Blocks IX and XIII of the Christchurch Survey District being Lot 1 on Deposited Plan 38418 —

DISTRICT LAND REGISTRAR



for Assistant Land Registrar

Mortgage 315723/1 to Bank of New Zealand - 12-3-1981 at 9.31

DISCHARGED
15/11/88
A.L.R.

NOTICE 403847/1 UNDER SECTION 42 OF THE MATRIMONIAL PROPERTIES ACT 1976 - 4.10.1982 at 1.30 p.m.

DISCHARGED
15/11/88
A.L.R.

for A.L.R.

Mortgage 448277/2 to United Building Society - 15.8.1983 at 10.48

DISCHARGED
31/10/83
A.L.R.

for A.L.R.

No. 448277/3 Memorandum of Priority making Mortgages 448277/2 and 315723/1 first and second mortgages respectively - 15.8.1983 at 10.48 a.m.

Transfer 720955/2 to Grahame James Roll, Engineer and Janice Margaret Roll, Housewife both of Christchurch - 15.1.1988 at 10.20am

DISCHARGED
17/12/88
A.L.R.

for A.L.R.

Mortgage 720955/3 to The Housing Corporation of New Zealand - 15.1.1988 at 10.20am

DISCHARGED
17/12/88
A.L.R.

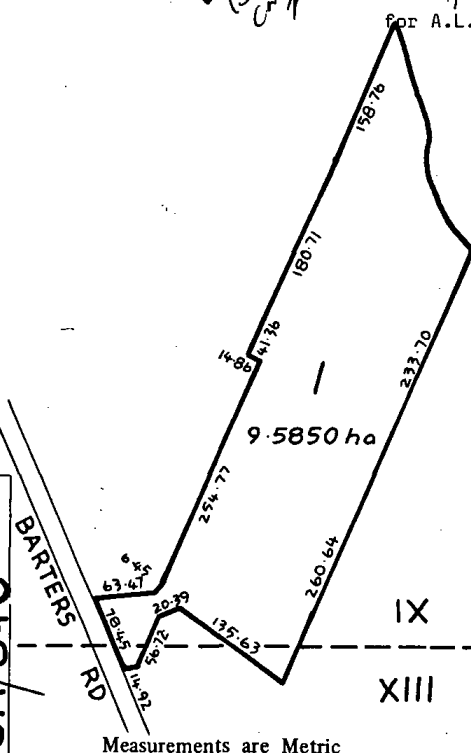
for A.L.R.

Mortgage 788294/1 to First Bank Canterbury Limited - 13.2.1989 at 10.47am

DISCHARGED
17/12/88
A.L.R.

for A.L.R.

over...



Measurements are Metric

No. 20A/840

20A/840

Transfer A168779/1 of Mortgage 720955X3 to
ANZ Banking Group (New Zealand) Limited -
19.4.1995 at 12.12pm

for A.L.R.

Transfer A274549/3 to David Francis
Parris of Christchurch, Barrister and
Solicitor and Joan Elizabeth Parris,
his wife

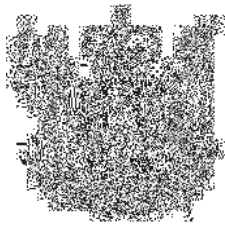
Mortgage A274549/4 to Farman & Co
Solicitors Nominees Company Limited

Both on 17.12.1996 at 9.03am

for A.L.R.

A306368.2 Mortgage to The National Bank of
New Zealand Limited
7.7.1997 at 3.40

for DLR



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB20A/841**
Land Registration District **Canterbury**
Date Issued 23 June 1979

Prior References
CB4C/385 CB5C/29

Estate Fee Simple
Area 2.1580 hectares more or less
Legal Description Lot 2 Deposited Plan 38418

Original Registered Owners
Larry Raymond Bagge and Carol Morven Bagge

Interests

11161911.1 Transmission to Carol Morven Bagge as survivor(s) - 16.7.2018 at 3:09 pm
12524243.1 Transfer to Trent James Williams and Kelly Jane Williams - 19.8.2022 at 12:02 pm
12524243.2 Mortgage to ANZ Bank New Zealand Limited - 19.8.2022 at 12:02 pm

References

Prior C/T 5C/29, 4C/385

Transfer No. 218060/3

N/C. Order No.

Land and Deeds 69



REGISTER

No. 20A/841

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 23rd day of June one thousand nine hundred and seventy-nine under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that DAVID ALISTER HIDDLESTON of Christchurch, Builder

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 2.1580 hectares or thereabouts situated in Blocks IX and XIII of the Christchurch Survey District being Lot 2 on Deposited Plan 38418



No. 218060/4 Settled under the Joint Family Homes Act 1964 on David Alister Hiddleston abovenamed and Marie Patricia Hiddleston his wife - 16.3.1979 at 9.38 a.m.

Mortgage 240629/1 to Marac Finance Company Limited - 8.4.1979 at 9.58 a.m.

Mortgage 218060/5 to Dorothy Muriel Archer, to Allan Cowen Grice, to Gladys Winifred Harman, to Alister James Greener, to Augustus Henry Watkins and to Murray Charles Loversidge in shares - 16.9.1979 at 9.39 a.m.

Mortgage 249417/1 to National Bank of New Zealand Limited - 26.10.1979 at 9.54 a.m.

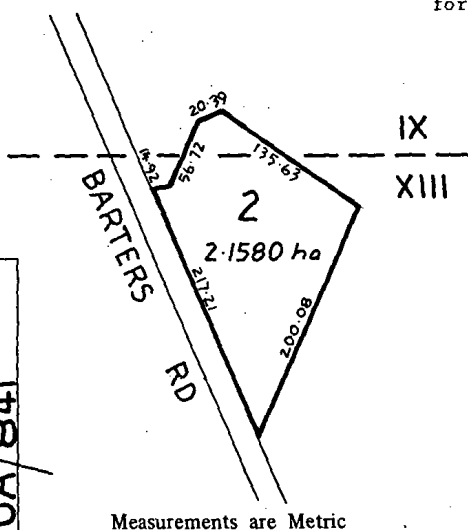
Mortgage 291149/1 of Marac Finance Limited - 9.11.1981 at 9.45 a.m.

No. 322952/4 Partial Discharge of Mortgage 291149/1 presented for registration 1.5.1981 at 10.26 a.m. and withdrawn from registration 21.5.1981

Transfer 322952/5 to Robin Donald Adams of Christchurch, Company Manager - produced 1.5.1981 at 10.26 a.m. and entered 4.5.1981 at 10.53 a.m.

Transfer 493161/1 to Larry Raymond Bagge of Christchurch, Motor Vehicle Dealer and Carol Morven Bagge his wife - 14.6.1984 at 11.57 a.m.

for A.L.R.



Measurements are Metric

No. 20A/841

394/165

NEW ZEALAND.

Land Transfer (Compulsory
Registration of Titles)
Act, 1921.
Deeds Index C. 2810
Application No. C. 4608



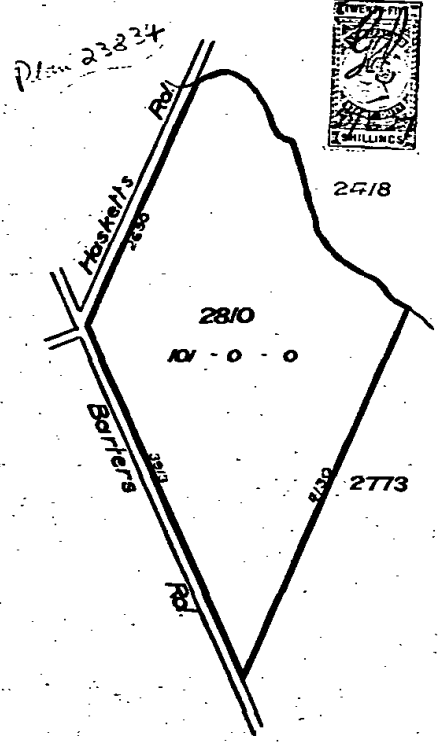
James Wed.
Register-book
Vol. 354, folio 166

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.
LIMITED AS TO PARCELS AND TITLE.

This Certificate, dated the Twenty-eighth day of May one thousand nine hundred and Twenty-seven
under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury Witnesseth that
NATHAN CLEGG of Hornby Bone-miller

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written
or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly
of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements
a little more or less, that is to say: All that parcel of land containing ONE HUNDRED AND ONE ACRES or thereabouts situated in
Block XIII of the Christchurch Survey District being Rural Section 2810 and being more particularly described
in Conveyance Registered No. 115457 (185/24)

Image Quality due
to Condition
of Original



394/166

Transmission 27513 to John Gerald
Baxter and Harold Clayton Baxter
both of 21 Templeton Farmers, dated 12
May 1951 at 2:52 pm.

John L. Love, Sr.
D.R.

349279 Transfer: John Gerald
Baxter and Harold Clayton
Baxter to the said John
Gerald Baxter produced
24 October 1951 at 11:20 am.

John L. Love, Sr.
D.R.

349280 Mortgage: John Gerald
Baxter ^{21/8/51} ~~21/8/51~~ ^{21/8/51} ~~21/8/51~~
Baxter ^{21/8/51} ~~21/8/51~~ ^{21/8/51} ~~21/8/51~~
1951 at 11:6 am.

John L. Love, Sr.
D.R.

Transfer 507111 John Gerald Baxter
to Norman Dean Thomas of
Christchurch Farmers produced
21/8/1959 at 12:6 pm.

John L. Love, Sr.
D.R.

Discharge
Mortgage 507112 Norman Dean
Thomas to John Gerald Baxter
produced 21/8/1959 at 12:6 pm.

① Mortgage 507553 Norman Dean Thomas to
Earlie Gray Thomas of Christchurch Farmers
produced 20/6/1960 at 2:36 pm.

Mortgage 527666 Earlie Gray Thomas to
Norman Dean Thomas produced 20/6/1960
at 2:37 pm.

Transfer of the terms of Mortgage 507553
to Mortgage 527666.

② Mortgage 507112 John Gerald Baxter
21/8/1959 at 12:6 pm.

Pursuant to Section 35(3) of the Land
Registration Act 1961 Part 21 DP 23834
vested in Her Majesty the Queen under
- 2/4/1965.

John L. Love, Sr.
D.R.

N.C. 649816 } cancelled and new C.S.
2/4/1965 } 41/377 to 386 and 396
issued for Lots 1 to 10
20 DP 23834.

John L. Love, Sr.
D.R.

Plans 41/377 to 386 and 396
Duplicate destroyed

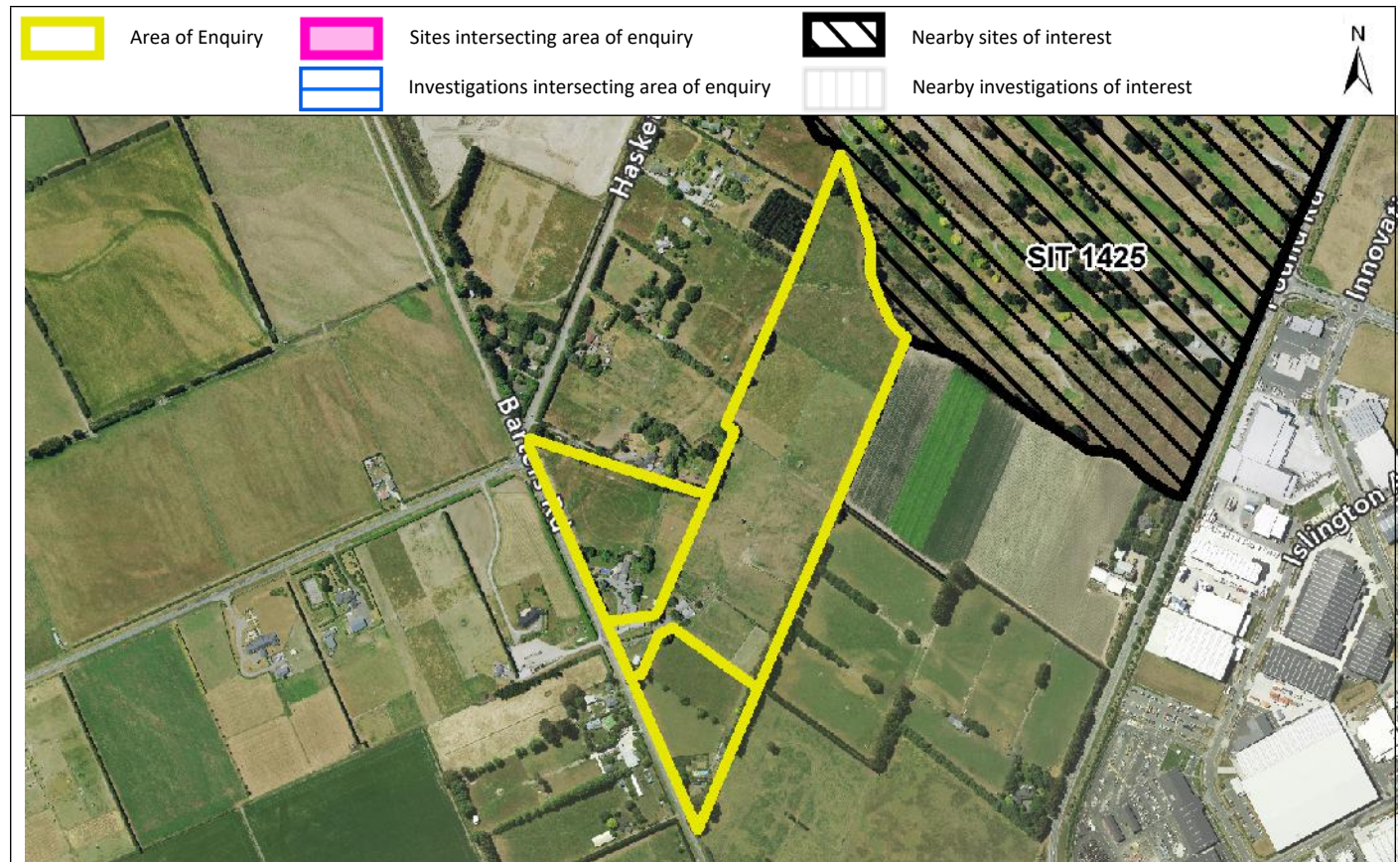
PLAN No. 23834 DEPOSITED 2-4-1965

Appendix B – LLUR Statement

Property Statement from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ360018

Date generated: 20 November 2023
Land parcels: Lot 2 DP 38418
Lot 1 DP 38418
Lot 7 DP 23834



The information presented in this map is specific to the area within a 100m radius of property you have selected. Information on properties outside the search radius may not be shown on this map, even if the property is visible.

Sites at a glance

 **Sites within enquiry area**

Site number	Name	Location	HAIL activity(s)	Category
-------------	------	----------	------------------	----------

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry only.

 **Nearby sites**

Site number	Name	Location	HAIL activity(s)	Category
1425	Templeton Country Club	Pound Road, Templeton, Christchurch	A17 - Storage tanks or drums for fuel, chemicals or liquid waste; A10 - Persistent pesticide bulk storage or use;	Not Investigated

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry within a 100m buffer.

More detail about the sites

Site 1425: Templeton Country Club (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: Pound Road, Templeton, Christchurch
Legal description(s): RES 2418; RES 5094; RS 38609; Lot 1 DP 34947

HAIL activity(s):	Period from	Period to	HAIL activity
	?	1993	Storage tanks or drums for fuel, chemicals or liquid waste
	Pre 1965	2011	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

Notes:

5 Jul 1999 1993: Two underground storage tanks on site, one 2350 L UST 3(a) product, and one 2300 L UST 3(c) product.
Land use = ?-1999: Golf Course

16 Nov 2017 Area defined from: 1965-2011 ECan Aerial Photographs Note: A sport turf golf course was noted on aerial photographs reviewed. 16/10/2013



Investigations:

There are no investigations associated with this site.



Nearby investigations of interest

There are no investigations associated with the area of enquiry.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

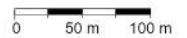
Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Appendix C – Historical Aerial Photographs



Legend

 Site Boundary



LINZ CC BY 4.0 © Imagery Basemap contributors, Land Information New Zealand, Environment Canterbury



Produced by **Datanest.earth**

Title: 1941 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings
Ltd

Project:
94 & 86 Barbers
Road

Drawn:
HG

Date: 20-11-2023

Checked:
NP

Proj No.: 817

Scale:
1:5545

Appendix: C
Size: A4

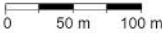
Version:
Final





Legend

Site Boundary



LINZ CC BY 4.0 © Imagery Basemap contributors, Land Information New Zealand, Environment Canterbury



Produced by Datanest.earth

Title: 1962 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings Ltd

Project:
94 & 86 Barbers Road

Date: 20-11-2023

Proj No.: 817

Drawn:
HG

Checked:
NP

Scale:
1:5545

Appendix: C
Size: A4

Version:
Final



Legend

 Site Boundary

0 50 m 100 m

LINZ CC BY 4.0 © Imagery Basemap contributors, Land
Information New Zealand, Environment Canterbury



Produced by **Datanest.earth**

Title: 1974 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings
Ltd

Project:
94 & 86 Barbers
Road

Drawn:
HG

Date: 20-11-2023

Checked:
NP

Proj No.: 817


Scale:
1:5545

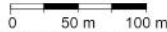
Appendix: C
Size: A4

Version:
Final



Legend

 Site Boundary



LINZ CC BY 4.0 © Imagery Basemap contributors, Land Information New Zealand, Ministry for Primary Industries, Environment Canterbury



Produced by **Datanest.earth**

Title: 1984 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings Ltd

Project:
94 & 86 Barbers Road

Date: 20-11-2023

Proj No.: 817

Drawn:
HG

Checked:
NP

Scale:
1:5545

Appendix: C
Size: A4

Version:
Final



Legend

□ Site Boundary

0 50 m 100 m

LINZ CC BY 4.0 © Imagery Basemap contributors, Land Information New Zealand, Environment Canterbury



Produced by **Datanest.earth**

Title: 1994 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings
Ltd

Project:
94 & 86 Barters
Road

Drawn:
HG

Date: 20-11-2023

Checked:
NP

Proj No.: 817

Scale:
1:5545

Appendix: C
Size: A4

Version:
Final



Legend

Site Boundary

0 50 m 100 m

LINZ CC BY 4.0 © Imagery Basemap contributors,



Produced by Datanest.earth

Title: 2005 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings
Ltd

Project:
94 & 86 Barbers
Road

Date: 20-11-2023

Proj No.: 817

Drawn:
HG

Checked:
NP

Scale:
1:5545

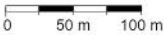
Appendix: C
Size: A4

Version:
Final



Legend

Site Boundary



LINZ CC BY 4.0 © Imagery Basemap contributors,
Environment Canterbury



Produced by **Datanest.earth**

Title: 2012 Historical Aerial Photograph

Client:
Ngai Tahu Development Holdings
Ltd

Project:
94 & 86 Barbers
Road

Date: 20-11-2023

Proj No.: 817

Drawn:
HG

Checked:
NP

Scale:
1:5545

Appendix: C
Size: A4

Version:
Final



Legend

 Site Boundary

0 50 m 100 m

LINZ CC BY 4.0 © Imagery Basemap contributors

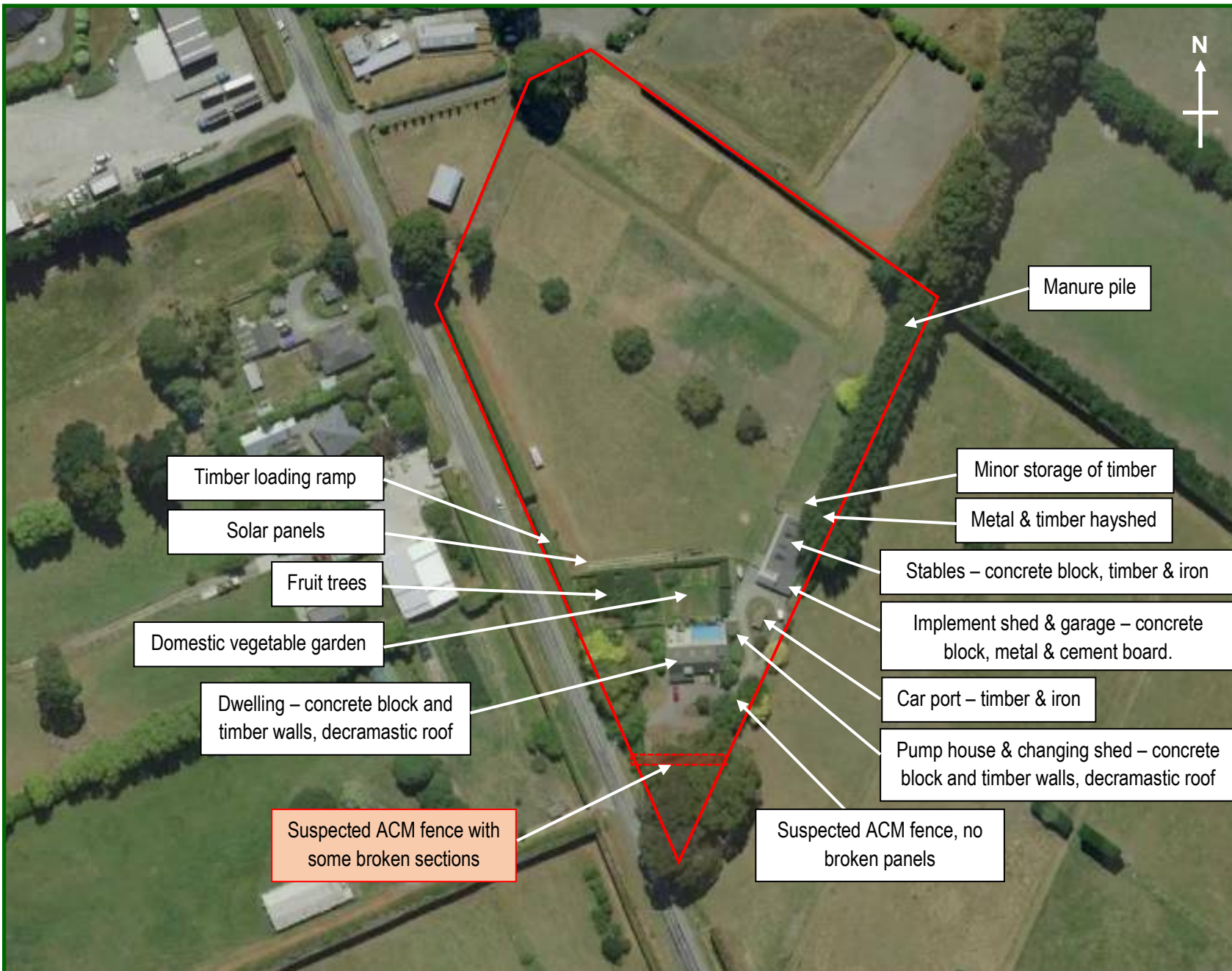


Produced by **Datanest.earth**

Title: Latest (2020) Aerial Photograph

Client: Ngai Tahu Development Holdings Ltd		Appendix: C Size: A4
Project: 94 & 86 Barbers Road	Drawn: HG	
Date: 20-11-2023	Checked: NP	
Proj No.: 817	Scale: 1:4915	
		Version: Final

Appendix D – Site Inspection Plans



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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/1

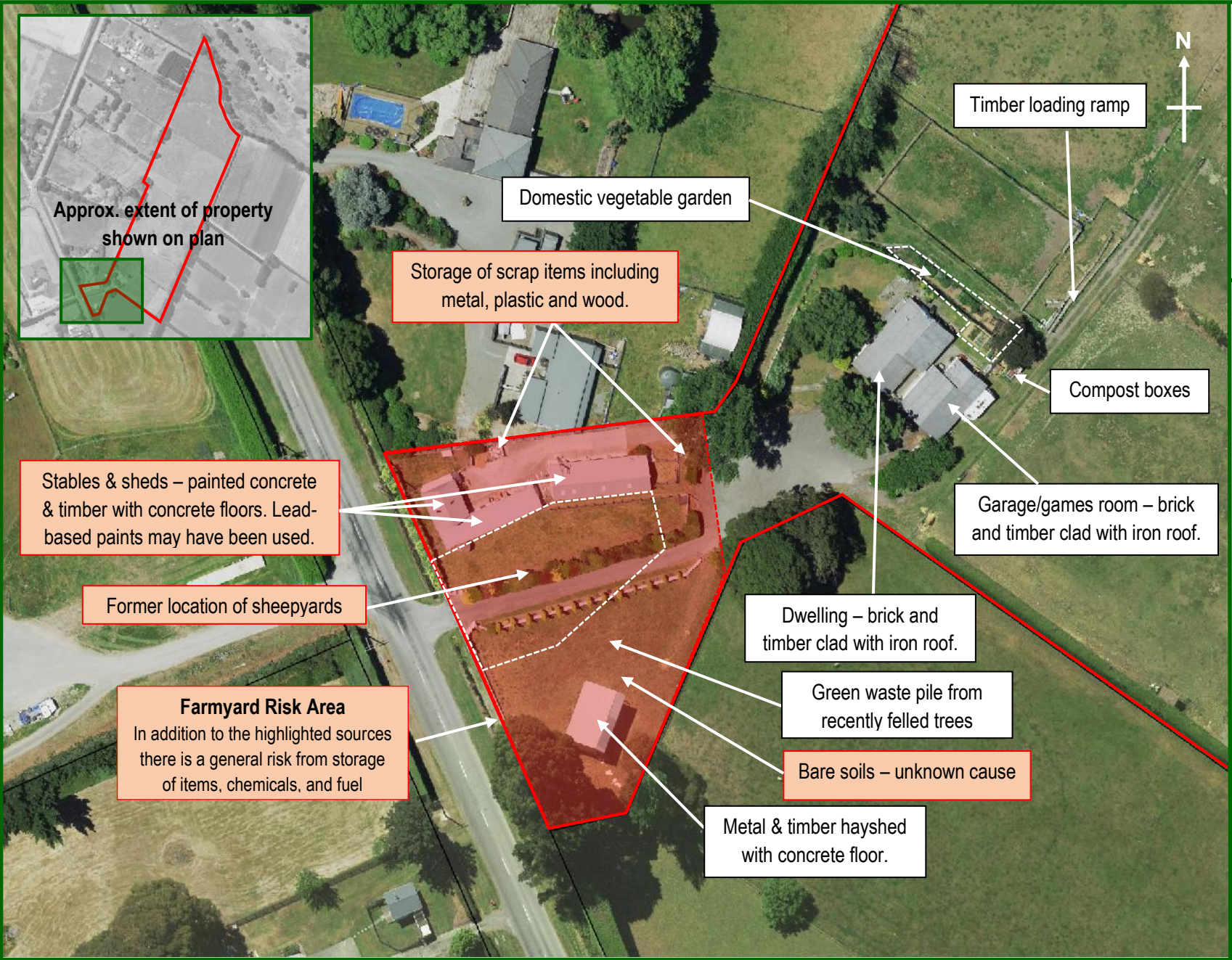
64 Barbers Road, Templeton Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



Approx. extent of property shown on plan



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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

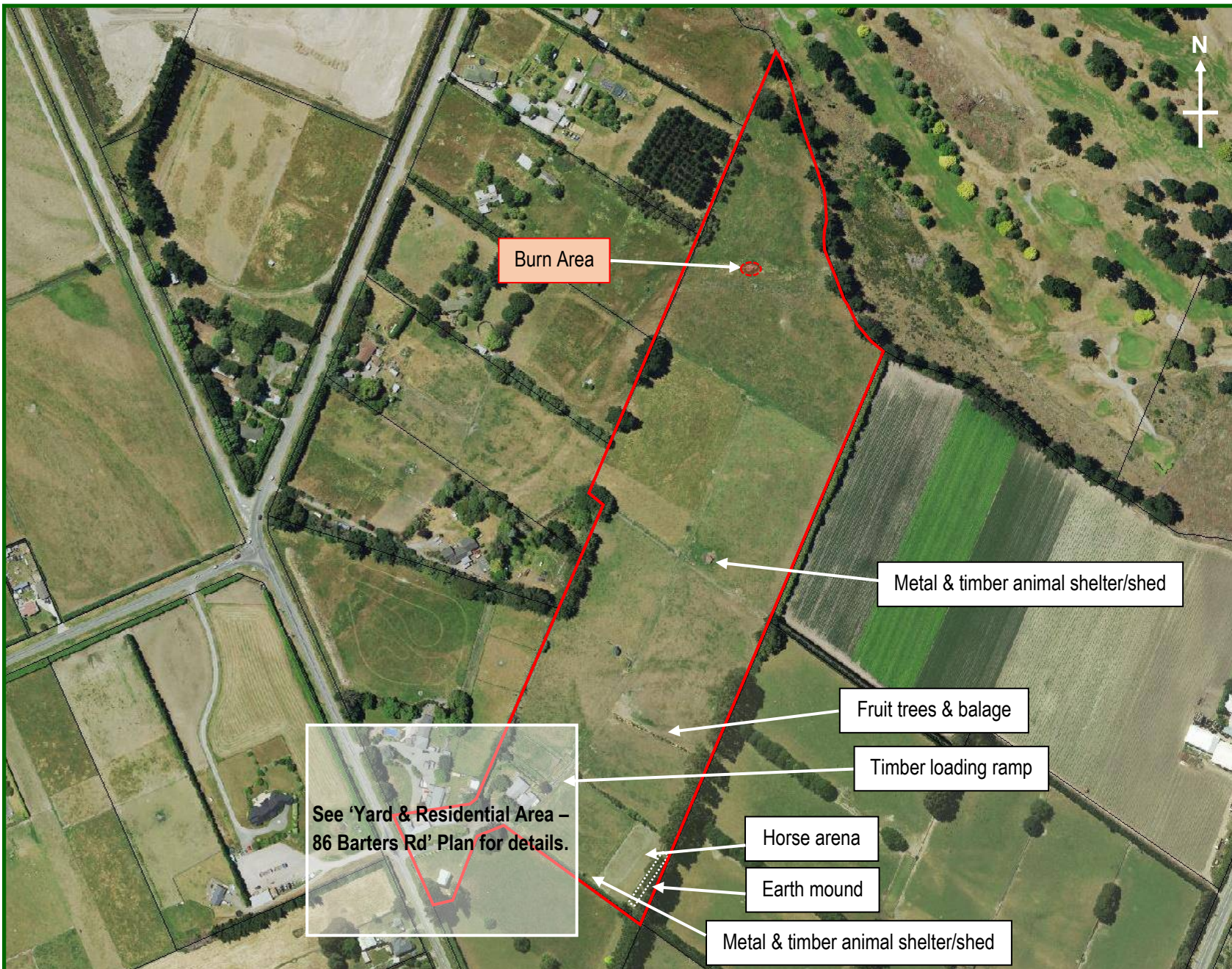


Graphic scale is approximate only

Date: 24 November 2023 Drawing No: 817/3

Yard & Residential Area - 86 Barters Road, Templeton
Site Inspection Plan

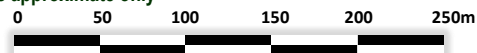
- Notes:
- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
 - 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
 - 3 Soil sample locations are approximate only



LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/2

86 Barter's Road, Templeton Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Residential & Farmyard Risk Area

In addition to the highlighted sources there is a general risk from lead based paint use on and storage of chemicals, and fuel in historical buildings

Dwelling – clad with brick and hardiplank, concrete tile roof.

Swimming pool

Duck pond




Approx. extent of property shown on plan



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LEGEND

-  Potential source of contamination
-  Description of structures/areas not considered to pose a risk
-  Approx. extent of risk areas



Play area

Shipping containers

Concrete & timber garage, concrete floor

Timber loading ramp

Minor storage of scrap metal

Caravan under a roof supported by two shipping containers.

Firewood piles

Concrete & timber woodshed

Water tank

Pump shed

Timber sleepout

AST

Concrete & timber shed, concrete floor

Concrete & timber sleepout/dwelling

Concrete & timber stables with sleepout/dwelling at southern end

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/5

Yard Area - 94 Barters Road, Templeton

Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Earth mound of unknown source. Includes bricks at southern end and embedded concrete pieces along length.

Bare soils – most likely due to water saturation

Storage of balage, few pallets and two tyres

Burn Area

See 'Yard Area – 94 Barters Road' Plan for further details.



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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/4

94 Barters Road, Templeton Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



**Soil Contamination Risk
Detailed Site Investigation Report**

**64, 86 & 94 Barters Road, Templeton,
Canterbury**

February 2024



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Specialist soil contamination experts, keeping your project moving.

QUALITY CONTROL AND CERTIFICATION SHEET

Client: NTP Development Holdings Ltd

Date of issue: 21 February 2024

Report written by:

Hollie Griffith, Senior Environmental Scientist, BEMP, CEnvP
(7 years contaminated land experience)

Signed: [REDACTED]

Email: [REDACTED]
[REDACTED]



Report reviewed and certified as a Suitably Qualified and Experienced Practitioner by:

Nicola Peacock, Principal Environmental Engineer, NZCE, CEnvP
(15 years contaminated land experience within 31 years environmental experience)

Signed: [REDACTED]
[REDACTED]
[REDACTED]



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APPENDICES

- A. PSI Site Inspection Plans
- B. Sample Location Plans
- C. Tables of Laboratory Results
- D. Laboratory Reports

1 Executive Summary

The site is located 64, 86 and 94 Barters Road in Templeton, Canterbury. The client is currently completing due diligence as part of the purchasing process. If purchased, the site is intended to be developed for industrial use in the future. This would involve the change of use of the land and future soil disturbance activities. As such, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) require an assessment of the likelihood of soil contamination being present. It is also noted that Momentum Environmental Ltd (MEL) is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016. This report details the work undertaken to assess the risks.

A Preliminary Site Investigation (PSI) was completed by MEL in December 2023 and showed the site has been used for rural and rural residential activities for its known history. Each of the individual properties within the site contains a dwelling, sheds and pastoral land used for grazing animals. The PSI identified the following potential sources of contamination, as per the Hazardous Activities and Industries List (HAIL):

- A potential livestock dip or spray race operation in animal yards visible in the 1962 aerial photograph at 86 Barters Road (HAIL A8).
- The potential use of farm structures for storage and mixing of persistent pesticides on both 86 and 94 Barters Road from as early as 1941 (HAIL A10).
- A rusted aboveground fuel storage tank present at 94 Barters Road (HAIL A17).
- A broken fence likely containing asbestos at 64 Barters Road (HAIL E1).
- Historical structures both existing and demolished posing a risk of lead contamination in surrounding soils at 86 and 94 Barters Road (HAIL I).
- Burn areas at 86 and 94 Barters Road (HAIL I).
- Storage areas including items of scrap such as metal, plastic and wood at 86 Barters Road (HAIL I).
- A bund of soils containing demolition debris at 94 Barters Road (HAIL I).

Based on the results of the NESCS assessment and preliminary conceptual site model, it was recommended that a Detailed Site Investigation (DSI) be undertaken on the site prior to future development.

Soil sampling was undertaken on 24 January 2024 as part of the DSI. The soil sampling results have shown one location contains concentrations of arsenic above the 'commercial/industrial' soil guideline values (SGV). This sampling location, BP2, is a burn area at 94 Barters Road.

While no other areas of the site contain soil contamination with concentrations above the 'commercial/industrial' guideline values, it is recommended that soils at sample location BP1, the burn area at 86 Barters Road, are also remediated due to the high levels of cadmium, copper, lead and zinc. Remediation of this burn area will likely assist with future soil disposal during the development phase.

In summary, the following recommendations have been made for the site as a whole:

- The DSI has identified two burn areas where remediation is recommended at 94 and 86 Barters Road. A Remediation Action Plan (RAP) will be required to support the remediation of the two burn areas

- It is recommended that the fence and all ACM are removed from 64 Barters Road and disposed of appropriately.
- Further asbestos assessment is recommended for the bund at 94 Barters Road, or alternatively capping should be considered.
- Robust erosion and sediment control measures will need to be implemented during any future earthworks on site to ensure contaminated soils do not enter adjacent waterways.
- Based on the presence of contaminant concentrations above expected background values in nearly every sample location, soils requiring off-site disposal from the investigated area are not suitable for disposal as cleanfill material. Soils from pastoral areas of the site where contaminating activities (HAIL areas) were not identified are likely to be suitable for disposal as cleanfill.

In terms of planning status at the time of writing of this report, the NESCS does apply to the site. Future activities that trigger the NESCS may require resource consent.

2 Objectives of the Investigation

This report has been written in general accordance with the Ministry for the Environment's (MfE) "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021" (CLMG1) and the "New Zealand Guidelines for Assessing and Managing Asbestos in Soils" (NZGAMAS). The report includes all requirements for a Detailed Site Investigation Report.

The objective of this investigation is to:

- Collect and assess information from multiple sources to understand previous and current land use.
- Describe the site's physical and environmental features to understand potential pathways and receptors.
- Collect and analyse site information, including soil sampling and testing, to determine the extent of any contamination present to inform remediation or site management options.
- Provide remediation or site management recommendations to the client based on identified human health and/or environmental risks.

3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Review of previous investigations undertaken on the site.
- Designing a sampling and analysis plan based on the identified contaminant risks.
- On site soil sampling and laboratory testing for contaminants of concern.
- Analysis of results against applicable soil guidelines values (SGVs).
- Preparation of this report in accordance with MfE guidelines.

4 Site Identification

The subject of this investigation is located at 64, 86 and 94 Barters Road in Templeton, Canterbury, from herein referred to as 'the site'. **Table 1** below outlines the key details of the site, also shown in **Figure 1** below.

Table 1 – Site Details

Site Address	Legal Description	Land Area
64 Barters Road	Lot 2 DP 38418	2.16ha
86 Barters Road	Lot 1 DP 38418	9.59ha
94 Barters Road	Lot 7 DP 23834	2.91ha
Total:		14.66ha

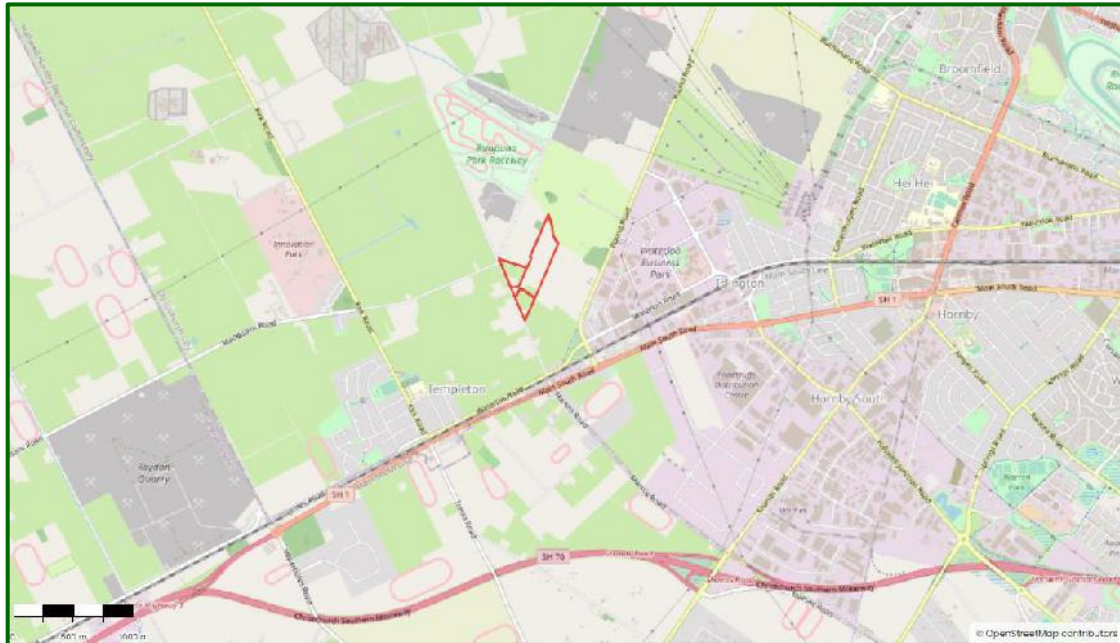


Figure 1 – Location Plan

5 Proposed Site Use

The client is currently completing due diligence as part of the purchasing process and has requested a Detailed Site Investigation be undertaken. If purchased, the site is intended to be developed for industrial use in the future. This would involve the change of use of the land and future soil disturbance activities.

6 Site Description

6.1 Environmental Setting

Table 2 – Environmental Setting

Topography	The topography of the site is generally flat land.
Geology	The ECan GIS database describes the soils at the site as a combination of the Selwyn moderately deep loam over sand, the Selwyn deep loam over sand and the Waimakariri deep silt. Information obtained from on-site and surrounding bore logs describe on-site and surrounding soils as topsoils underlain by silts or sands, followed by gravels.
Soil Trace Elements	According to the ECan GIS database, natural concentrations of trace elements for the site are those of the 'Regional, Recent' soil group.
Groundwater	The site lies over the unconfined and semiconfined gravel aquifer system. Information obtained from on-site and surrounding bore logs shows groundwater levels are approximately 14.57-16.80m deep. The direction of groundwater flow is generally in a south-easterly direction.
Surface Water	An unnamed drain runs through the centre of the site and parallel with Barters Road.

6.2 Site Layout and Current Site Uses

The site is used for rural residential purposes. Both 64 and 94 Barters Road contain a dwelling, swimming pool, multiple sheds and vacant paddocks. 86 Barters Road contains a dwelling, sheds, animal yards and vacant paddocks.

6.3 Surrounding Land Uses

The majority of the surrounding area is used for rural residential land.

6.4 Geotechnical Investigations

At the time of writing no geotechnical investigations were available to Momentum Environmental Ltd (MEL).

7 Summary of Preliminary Site Investigation

A Preliminary Site Investigation (PSI) for the site was completed by Momentum Environmental Ltd (MEL) in December 2023. The investigation included a review of ECan GIS data including the Listed Land Use Register (LLUR), historical aerial photographs, historical certificates of title and the Christchurch City Council property file. A site inspection was undertaken on 21 November 2023.

The PSI found that the site has been used for rural and rural residential activities for its known history. Each of the individual properties within the site currently contain a dwelling, sheds and pastoral land used for grazing animals. The PSI identified the following potential sources of contamination, as per the Hazardous Activities and Industries List (HAIL):

- A potential livestock dip or spray race operation in animal yards visible in the 1962 aerial photograph at 86 Barters Road (HAIL A8).
- The potential use of farm structures for storage and mixing of persistent pesticides on both 86 and 94 Barters Road from as early as 1941 (HAIL A10).
- A rusted aboveground fuel storage tank present at 94 Barters Road (HAIL A17).
- A broken fence likely containing asbestos at 64 Barters Road (HAIL E1).
- Historical structures both existing and demolished posing a risk of lead contamination in surrounding soils at 86 and 94 Barters Road (HAIL I).
- Burn areas at 86 and 94 Barters Road (HAIL I).
- Storage areas including items of scrap such as metal, plastic and wood at 86 Barters Road (HAIL I).
- A bund of soils containing demolition debris at 94 Barters Road (HAIL I).

The contaminants of concern were considered to include heavy metals, organochlorine pesticides, hydrocarbons and possibly asbestos. A copy of the PSI Site Inspection Plans which also shows the identified risk areas is included in **Appendix A**.

The PSI concluded that there may be a risk to human health from contaminated soils across the site associated with the above activities. It recommended that further investigation of the site be undertaken, and a Detailed Site Investigation completed.

8 Sampling and Analysis Plan

8.1 Sampling Design

The proposed use for the site is commercial/industrial. The Site Inspection Plans included in **Appendix A** show multiple risk areas situated across the three properties within the site. The various identified potentially contaminating activities have differing modes and likely depths of contamination and contaminants of concern. Therefore, for the purposes of sampling design there are five exposure areas within the site, these are the burn areas located at both 86 and 94 Barters Road, the bund of soil located at 94 Barters Road, the suspected ACM fence located at 64 Barters Road and each of the yards located at 86 and 94 Barters Road. The details of the sampling design for each exposure area are shown below in **Tables 3-7**.

Table 3 – Sampling Design (Burn Areas at 86 & 94 Barters Road)

Contaminants of Concern	Heavy metals and potentially asbestos
Media to be sampled	Soils
Number of sample locations	A judgemental sampling methodology is to be implemented with samples targeted to identified burn areas. XRF testing may be undertaken to guide sampling.
Depth of samples	Due to the likely mode of contamination a single sample will be collected from surface soils within each burn area.
Testing Methodology	All samples will be tested for heavy metals. Asbestos sampling will be completed if visual evidence of asbestos contamination is present within the burn areas.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.

Table 4 – Sampling Design (Soil bund at 94 Barters Road)

Contaminants of Concern	Heavy metals and asbestos
Media to be sampled	Soils
Number of sample locations	An approximate grid of 16 samples will be collected from the bund. Each sample is to be an in-field composite made up of soils from each segment of the grid.
Depth of samples	Each sample is to be an in-field composite made up of soils from each segment of the grid.
Testing Methodology	All samples will be analysed for heavy metals and semi quantitative analysis for asbestos.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.

Table 5 – Sampling Design (Suspected ACM fence at 64 Barters Road)

Contaminants of Concern	Asbestos
Media to be sampled	ACM fence and soils
Number of sample locations	A single sample is to be collected from soils beneath the fence and a single bulk sample will be collected from a fragment of the fence.
Depth of samples	Due to the likely mode of contamination sampling will be restricted to surface soils.
Testing Methodology	Semi quantitative analysis for asbestos in soils and presence/absence analysis on the bulk sample.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves. The samples will be double-bagged.

Table 6 – Sampling Design (Yard at 86 Barters Road)

Contaminants of Concern	Heavy metals and organochlorine pesticides (OCPs)
Media to be sampled	Soils
Number of sample locations	A judgemental sampling methodology is to be implemented with samples targeted to identified risk areas, approximately 20 sample locations.
Depth of samples	Due to the likely mode of contamination and future use of the site, samples will be collected from surface (0-50mm) and shallow soils (250mm).
Testing Methodology	All samples will be tested for heavy metals. Surface samples in the relevant risk areas will be analysed for OCPs as composite samples, with individual analysis following if required.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves. The samples will be double-bagged.

Table 7 – Sampling Design (Yard at 94 Barters Road)

Contaminants of Concern	Heavy metals and hydrocarbons
Media to be sampled	Soils
Number of sample locations	A judgemental sampling methodology is to be implemented with samples targeted to identified risk areas, approximately 20 sample locations.
Depth of samples	Due to the likely mode of contamination and future use of the site, samples will be collected from surface (0-50mm) and shallow soils (250mm).
Testing Methodology	All samples will be tested for heavy metals. Hydrocarbon analysis will be undertaken where visual or olfactory evidence is present.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves. The samples will be double-bagged.

8.2 Soil Guideline Values

Human health soil contaminant standards for a group of 12 priority contaminants were derived under a set of five land-use scenarios and are legally binding under The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NES). These standards have been applied where applicable. The regulations describe these as Soil Contaminant Standards. For contaminants other than the 12 priority contaminants, the hierarchy as set out in the Ministry for the Environment Contaminated Land Management Guidelines No 2 has been followed. These are generally described as Soil Guideline Values. For simplicity, this report uses the terminology Soil Guideline Values (SGVs) when referring to the appropriate soil contaminant standard or other derived value from the hierarchy. For soil, guideline values are predominantly risk based, in that they are typically derived using designated exposure scenarios that relate to different land uses. For each exposure scenario, selected pathways of exposure are used to derive guideline values. These pathways typically include soil ingestion, inhalation and dermal adsorption. The guideline values for the appropriate land use scenario relate to the most critical pathway.

The land-use scenario considered applicable for the proposed future use of this site and used as a proxy value to protect the health of construction workers is the 'commercial/industrial/outdoor workers' land-use scenario.

The adopted trigger values used to determine need for assessment of ecological receptors, also referred to as Ecological Guideline Values (EGVs) are the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (online) – Sediment GV-high (ANZWQ).

Heavy metal concentrations will also be assessed against the expected background levels as published in *Background Concentrations in Canterbury Soils*, Tonkin and Taylor, July 2007.

8.3 Quality Assurance and Quality Control

Field quality assurance measures as described in section 4.3.1 of the CLMG are to be followed, including using trained staff, choosing appropriate sample containers, accurate and individual labelling and recording of locations, completing appropriate laboratory chain of custody forms, chilling of samples as appropriate and timely delivery to laboratories. All non-disposable sampling equipment should be decontaminated between samples using Decon 90 and rinsed with tap water. All samples are to be submitted to IANZ accredited laboratories. Quality control to ensure freedom from sample cross-contamination is to be measured by the appropriate use of duplicate and rinsate blank samples.

9 Sampling Results

9.1 Summary of Works/Field Observations

Soil sampling was undertaken on the 22nd and 24th of January 2024. Sampling proceeded in general accordance with the proposed sampling plan. Sample Location Plans are included in **Appendix B**.

64 Barters Road

The pile of broken asbestos cement board observed during the site inspection had been removed from the property by the time of sampling. A soil sample (SS42A) was taken at the location of the former pile to confirm whether asbestos contamination of the underlying soils had occurred. A fragment of cement board fence panel was removed from the fence and submitted for asbestos presence analysis to confirm the fence panels do contain asbestos.



Photo 1 – Area cleared of ACM pieces

86 Barters Road

Eighteen judgemental sample locations (SS1-SS18) were sampled at surface and 250mm depth across the identified yard risk area. The observed soils were silty topsoils over silt with cobbles. Anthropogenic material including crushed concrete and angular gravel were observed at some sample locations. The samples were all submitted for heavy metal analysis. The samples within the former sheepyards were also submitted for OCP analysis as composite samples.

Surface soils were XRF tested in and around the current waste pile at the burn area on the north of the property. The XRF testing indicated that arsenic exceeding the 'commercial/industrial' SGV was present. A surface soil sample (BP1@50) was taken at the location of the highest XRF arsenic reading. The soil sample was submitted for heavy metal analysis.



Photo 2 – Burn area at 86 Barters Road

94 Barters Road

Twenty-three judgemental sample locations (SS19-SS41) were sampled at surface and 250mm depth across the identified yard risk area. The observed soils were mainly silty topsoil over silt/silt with stones. Anthropogenic material including fragments of brick, glass and concrete were observed 250mm depth at SS25, SS38, and SS40. A layer including gravel, brick fragments and a ceramic fragment was observed at 100mm depth at location SS33, so this layer was sampled instead of the surface soils. The samples were submitted for heavy metal analysis. A selection of samples from locations around the older yard area (SS36, SS37, SS38 and SS39) were also submitted for OCP analysis as composite samples.

The current owner advised that the fuel above ground storage tank observed in the yard area during the PSI site walkover had never been used on-site. There was also no visual or olfactory evidence of fuel spills from the tank. Therefore, no sampling at the tank location was considered necessary.

Surface soils were XRF tested in and around the current waste pile at the burn area on the north of the property. The waste pile included some timber and wire as well as green waste. The XRF testing indicated that arsenic likely exceeded the 'commercial/industrial' SGV. A surface soil sample (BP2@50) was taken at the location of the highest XRF arsenic reading. The soil sample was submitted for heavy metal analysis.



Photo 3 – 94 Barters Road burn area



Photo 4 – Timber within burn pile

Sixteen field composite samples were taken from the bund of soils along the western boundary of 94 Barters Road. Due to the soil being very dry and hard, samples were only able to be taken by hand from the top 100mm layer. Concrete, bitumen, brick, and wood pieces were observed amongst the stony soils along the length of the bund. A piece of suspected asbestos cement board was identified at SP3 and submitted for asbestos presence analysis. The soil samples from the bund were submitted for heavy metal and semi-quantitative asbestos analysis. Due to the presence of bitumen pieces samples from the bund were also submitted for PAH analysis as four composite samples.

A total of 108 samples including 4 duplicates were submitted to the laboratory for heavy metal analysis. 17 soil samples and 2 bulk samples were submitted for asbestos presence/absence analysis. 6 composite samples each containing 4 sub-samples were analysed for OCPs. 4 composite samples each containing 4 sub-samples were analysed for PAHs. No visual or olfactory evidence of TPH contamination was observed during sampling so no samples were submitted for TPH analysis.

9.2 Evaluation of Results

The laboratory results showed arsenic concentrations above the 'commercial/industrial' soil guideline value (SGV) of 70mg/kg at sample location BP2 within the burn area at 94 Barters Road. The arsenic result at sample location BP2 was 179mg/kg. There were no other exceedances of the 'commercial/industrial' SGVs at the site.

Lead and zinc concentrations exceeded the Ecological Guideline Values (EGVs) in multiple sample locations across the site. Of the lead exceedances, concentrations ranged from 250-600mg/kg, compared to the EGV of 220mg/kg. Of the zinc exceedances, the concentrations ranged from 420-1850mg/kg compared to the EGV of 410mg/kg. At sample location BP2, copper concentrations also exceeded the EGV with a result of 380mg/kg compared to the EGV of 270mg/kg. At sample location BP1 cadmium, copper, lead and zinc concentrations were above the EGVs. The cadmium result was 10.8mg/kg compared to the EGV of 10mg/kg, the copper result was 5900mg/kg, the lead result was 600mg/kg and the zinc result was 1850mg/kg.

Background concentrations were exceeded in the majority of sample locations.

The composite samples analysed for OCPs showed concentrations below the laboratory limit of detection in all but two composite samples. The composite sample consisting of samples SS8, SS9, SS12 and SS13, collected from the yard area at 86 Barters Road showed levels of dieldrin above expected background concentrations at both surface soils and at 250mm. The results were 0.052mg/kg at 50mm and 0.064 at 250mm compared to expected background levels of 0.0061mg/kg and the 'commercial/industrial' SGV of 160mg/kg.

The Polycyclic Aromatic Hydrocarbon (PAH) analysis completed on the composite samples from the bund at 94 Barters Road showed four compounds with concentrations above expected background values in the composite containing soils from SP9, SP10, SP11 and SP12. All the PAH results were below the applicable SGVs.

No asbestos was detected in the soil samples submitted for asbestos analysis. Presence/absence analysis completed on the two bulk samples collected from the site returned positive results. Chrysotile (white asbestos) was present in the bulk sample collected from the broken fence at 64 Barters Road. Chrysotile (white asbestos) and Amosite (brown asbestos) was present in the bulk samples collected from SP3 from within the soil bund at 94 Barters Road.

Tables of Laboratory Results are shown in **Appendix C**. Copies of the Laboratory Reports are included in **Appendix D**.

9.3 Results of Field & Laboratory Quality Assurance and Quality Control

No quality control issues were identified during sampling. The Relative Percentage Differences (RPD) for the four duplicate sample pairs ranged from 0-29%, within acceptable ranges for all analytes.

All laboratory tested samples were submitted to Hill Laboratories. Hill Laboratories hold IANZ accreditation. As part of holding accreditation the laboratory follows appropriate testing and quality control procedures. No quality control issues were identified.

10 Risk Assessment

The soil sampling results have shown one location contains concentrations of arsenic above the 'commercial/industrial' SGV. This sampling location, BP2, is a burn area at 94 Barters Road. Copper

and zinc concentrations also exceeded the EGV in this location. It is anticipated that the contamination is restricted to surface soils, as is typical of burn areas. It is recommended the burn area is remediated prior to development of the site.

While no other areas of the site contain soil contamination with concentrations above the applicable guideline values and therefore requiring remediation, it is recommended that soils at sample location BP1, the burn area at 86 Barthers Road, are also remediated due to the high levels of cadmium, copper, lead and zinc. Remediation of this burn area will likely assist with future soil disposal during the development phase.

Outside of the above burn areas, lead and zinc concentrations exceeded the EGVs in multiple sample locations across the site. In most locations the exceedances were not significant and restricted to the surface soils. It is recommended that robust erosion and sediment controls are in place during earthworks activities to prevent mobilisation of soils into the on-site and neighbouring drain.

The fence at 64 Barthers Road is confirmed as containing ACM however the asbestos has not impacted the underlying soils, as shown by the results of the semi-quantitative analysis. One ACM fragment was also identified in the bund of soil at 94 Barthers Road. The presence of further fragments in the bund cannot be ruled out.

The conceptual site model addresses the risks associated with the identified contaminants:

Table 8 – Conceptual Site Model

Conceptual Site Model – Heavy Metals in Burn Areas				
Source	Pathways		Receptor	Risk Assessment
High concentrations of heavy metals in two burn areas at the site exceeding 'commercial/industrial' SGV.	Human	Dermal contact, ingestion and inhalation	Future site occupiers / land users.	Moderate risk to human health in an industrial setting as arsenic concentrations exceed the 'commercial/industrial' SGV at BP2.
			Workers involved in soil disturbance at the site.	Moderate risk to human health as arsenic concentrations exceed the 'commercial/industrial' SGV at BP2.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.57-16.80m at the site.	Low risk given depth to groundwater.
		Surface runoff to waterways	On-site and neighbouring drain.	Moderate risk during earthworks. It is recommended that the burn areas are remediated completely on one fine day.

Conceptual Site Model – Heavy Metals on other Parts of Site				
Source	Pathways		Receptor	Risk Assessment
Moderate concentrations of heavy metals at various locations across the site exceeding Ecological Guideline Values	Human	Dermal contact, ingestion and inhalation	Future site occupiers / land users.	Low risk to human health as concentrations are below the 'commercial/industrial' SGV.
			Workers involved in soil disturbance at the site.	Low risk to human health as concentrations are below the 'commercial/industrial' SGV.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.57-16.80m at the site.	Low risk given depth to groundwater.
		Surface runoff to waterways	On-site and neighbouring drain.	Moderate risk during earthworks. It is recommended that robust erosion and sediment controls are implemented.

Conceptual Site Model - Asbestos				
Source	Pathways		Receptor	Risk Assessment
An ACM fragment identified in the bund at 94 Barthers Road. No asbestos in soils was identified within the bund. Limited depth of sampling.	Human	Inhalation	Future site occupiers / land users.	Low to moderate risk to human health in an industrial setting as the full depth of the bund was not able to be characterised with hand sampling.
			Workers involved in soil disturbance at the site.	Low to moderate risk to human health in an industrial setting as the full depth of the bund was not able to be characterised with hand sampling.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.57-16.80m at the site.	Low risk to groundwater as asbestos does not transport readily through soils.
		Surface runoff to waterways	On-site and neighbouring drain.	Low to moderate risk as the full depth of the bund was not able to be characterised with hand sampling.

11 Recommendations

Based on the above, it is recommended that remediation of the two burn areas occur prior to development of the site for industrial purposes. Given the relatively small areas requiring remediation, excavation and off-site disposal to an appropriate disposal facility is likely the most suitable remediation

option. A Remediation Action Plan (RAP) will be required to support the remediation of the two burn areas.

It is recommended that the fence and all ACM are removed from 64 Barters Road and disposed of appropriately as per the Health and Safety at Work (Asbestos) Regulations 2016.

One ACM fragment was also identified in the bund of soil at 94 Barters Road. Samples were only able to be taken by hand from the surface 100mm of this pile due to it being very dry and hard. The presence of further fragments in the bund cannot be ruled out. If the bund is to be removed from site, then it is recommended that further analysis of the bund be completed using a digger to access the soils in the middle, in order to determine an appropriate disposal location with confidence. Alternatively, keeping this bund on site and capping it with geofabric and clean soils would address the unknown risk.

Based on the presence of contaminant concentrations above expected background values across much of the investigated area, soils requiring off-site disposal in these locations are not suitable for disposal as cleanfill material. Soils from pastoral areas of the site where contaminating activities (HAIL areas) were not identified are likely to be suitable for disposal as cleanfill.

12 Regulatory Assessment

In terms of planning status at the time of writing of this report, the NESCS does apply to the site. Future activities that trigger the NESCS may require resource consent.

It is recommended that a planner fully assess all proposed activities associated with the development against the Land and Water Regional Plan to determine whether resource consents from ECan are necessary due to the identification of contaminated land.

13 Conclusion

A PSI completed by MEL in December 2023 identified a risk of heavy metal, OCP, hydrocarbon and possibly asbestos contamination in various areas of the site from multiple current and historical HAIL activities related to farming uses. It was recommended that a DSI be undertaken on the site prior to development for future industrial use and this was completed in January 2024 with the following recommendations having been made:

- The DSI has identified two burn areas where remediation is recommended at 94 and 86 Barters Road. A Remediation Action Plan (RAP) will be required to support the remediation of the two burn areas
- It is recommended that the fence and all ACM are removed from 64 Barters Road and disposed of appropriately.
- Further asbestos assessment is recommended for the bund at 94 Barters Road, or alternatively capping should be considered.
- Robust erosion and sediment control measures will need to be implemented during any future earthworks on site to ensure contaminated soils do not enter adjacent waterways.
- Based on the presence of contaminant concentrations above expected background values in nearly every sample location, soils requiring off-site disposal from the investigated area are not suitable for disposal as cleanfill material. Soils from pastoral areas of the site where

contaminating activities (HAIL areas) were not identified are likely to be suitable for disposal as cleanfill.

In terms of planning status at the time of writing of this report, the NESCS does apply to the site. Future activities that trigger the NESCS may require resource consent.

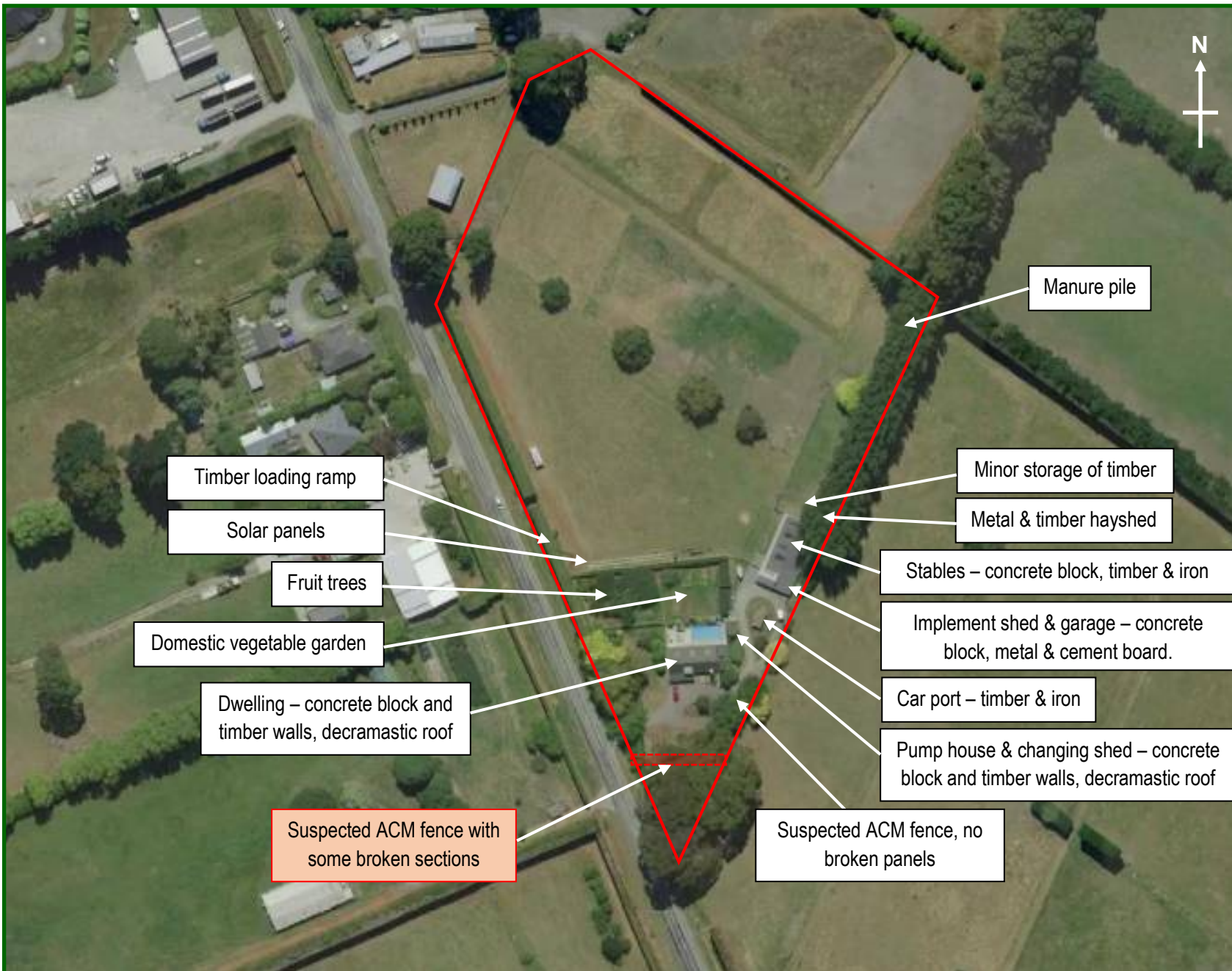
14 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the site, Malloch Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

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Appendix A – PSI Site Inspection Plans



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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/1

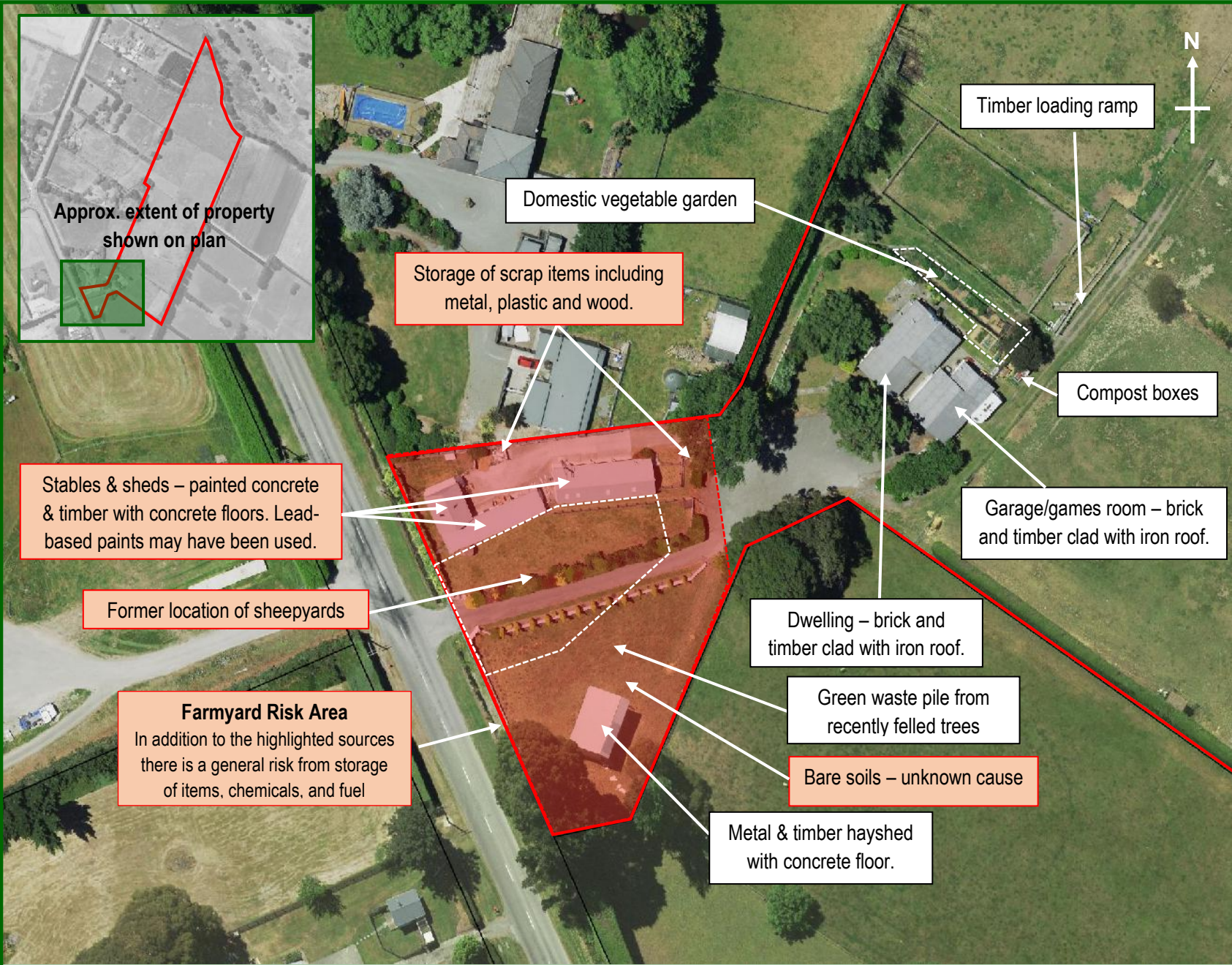
64 Barbers Road, Templeton Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



Approx. extent of property shown on plan



Domestic vegetable garden

Storage of scrap items including metal, plastic and wood.

Timber loading ramp

Compost boxes

Stables & sheds – painted concrete & timber with concrete floors. Lead-based paints may have been used.

Garage/games room – brick and timber clad with iron roof.

Former location of shepyards

Farmyard Risk Area
In addition to the highlighted sources there is a general risk from storage of items, chemicals, and fuel

Dwelling – brick and timber clad with iron roof.

Green waste pile from recently felled trees

Bare soils – unknown cause

Metal & timber hayshed with concrete floor.

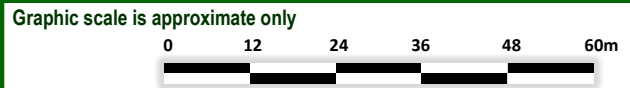


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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas



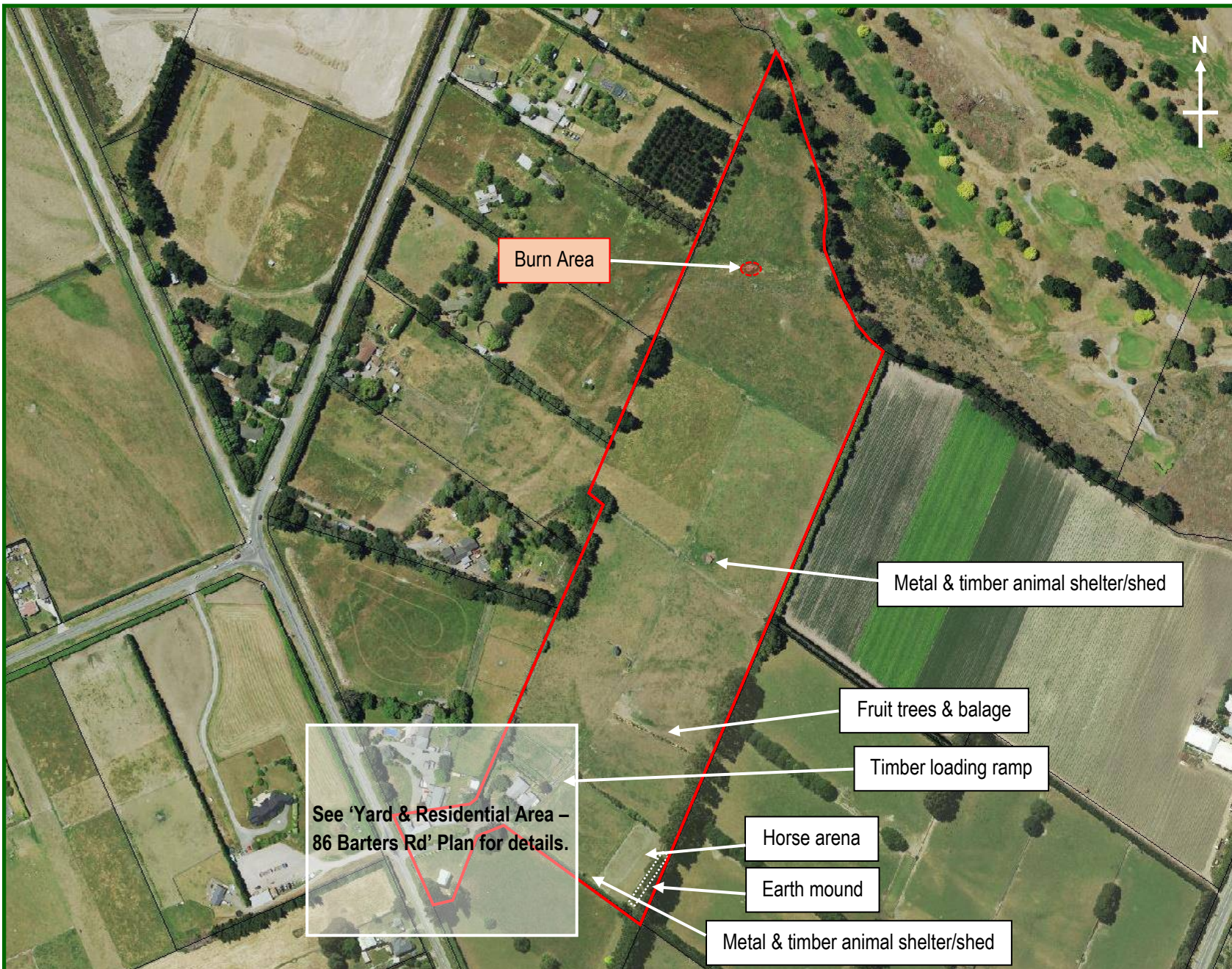
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Date: 24 November 2023 Drawing No: 817/3

Yard & Residential Area - 86 Barters Road, Templeton

Site Inspection Plan

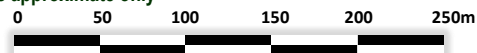
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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/2

86 Barter's Road, Templeton Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Residential & Farmyard Risk Area

In addition to the highlighted sources there is a general risk from lead based paint use on and storage of chemicals, and fuel in historical buildings

Dwelling – clad with brick and hardiplank, concrete tile roof.

Swimming pool

Duck pond




Approx. extent of property shown on plan



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LEGEND

-  text Potential source of contamination
-  text Description of structures/areas not considered to pose a risk
-  Approx. extent of risk areas



Play area

Shipping containers

Concrete & timber garage, concrete floor

Timber loading ramp

Minor storage of scrap metal

Caravan under a roof supported by two shipping containers.

Firewood piles

Concrete & timber woodshed

Water tank

Pump shed

Timber sleepout

AST

Concrete & timber shed, concrete floor

Concrete & timber sleepout/dwelling

Concrete & timber stables with sleepout/dwelling at southern end

Graphic scale is approximate only



Yard Area - 94 Barters Road, Templeton

Site Inspection Plan

Date: 24 November 2023

Drawing No: 817/5

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
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- 3 Soil sample locations are approximate only

Earth mound of unknown source. Includes bricks at southern end and embedded concrete pieces along length.

Bare soils – most likely due to water saturation

Storage of balage, few pallets and two tyres

Burn Area

See 'Yard Area – 94 Barters Road' Plan for further details.



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LEGEND

- text Potential source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of risk areas

Graphic scale is approximate only



Date: 24 November 2023

Drawing No: 817/4

94 Barters Road, Templeton Site Inspection Plan

Notes:

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Appendix B – Sample Location Plans



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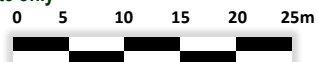
LEGEND

- **SS1A** Soil sample location tested for asbestos semi-quantitative
- **BULK** Bulk fragment tested for presence/absence
- **BULK** Bulk fragment tested positive for asbestos

PLAN MUST BE PRINTED IN COLOUR

• SS42A • **BULK** –
64 Barbers

Graphic scale is approximate only



Date: 29 January 2024

Drawing No: 817/6

64 Barbers Road, Templeton
Sample Location Plan

Notes:


- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

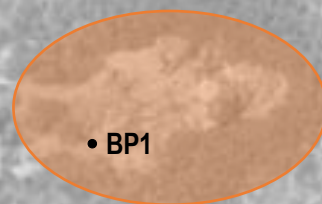


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LEGEND

- SS1 Soil sample location
-  Area recommended for remediation due to heavy metal concentrations



PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only



Date: 01 February 2024

Drawing No: 817/8

86 Barters Road, Templeton
Sample Location Plan – Burn Area

Notes:


- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



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LEGEND

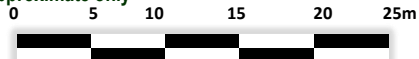
- SS1 Soil sample location
-  Composite sample grouping

PLAN MUST BE PRINTED IN COLOUR



Approx. extent of site shown on plan

Graphic scale is approximate only



Date: 01 February 2024




Drawing No: 817/7

86 Barbers Road, Templeton Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

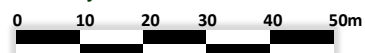
LEGEND

- **SS1** Soil sample location
- **SS1A** Soil sample location tested for asbestos semi-quantitative
- **BULK** Bulk fragment tested for presence/absence
- **BULK** Bulk fragment tested positive for asbestos
- ⊙ **SS1** Soil sample location exceeds commercial/industrial SGV for arsenic
-  Approximate extent of area requiring remediation
-  Composite sample groupings
-  Stockpile extent

PLAN MUST BE PRINTED IN COLOUR



Graphic scale is approximate only



Date: 02 February 2024

Drawing No: 817/10

94 Barbers Road, Templeton

Sample Location Plan – Burn Area and Stockpile

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

LEGEND

- SS1 Soil sample location
- Composite sample grouping

PLAN MUST BE PRINTED IN COLOUR



Graphic scale is approximate only



Date: 01 February 2024

Drawing No: 817/9

94 Barbers Road, Templeton Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Appendix C – Table of Laboratory Results

Table of Laboratory Results - 64, 86 & 94 Barters Road, Templeton

Date of sampling: 24 January 2024



Analyte	Sample Name:	SS1@50	SS1@250	SS2@50	DUP1	SS2@250	SS3@50	SS3@250	SS4@50	RPD	Soil Guideline Values				
Soil Results	Depth (mm)	50	250	50	50	250	50	250	50	DUP1 & SS2@50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.1	3451017.2	3451017.3	3451017.83	3451017.4	3451017.5	3451017.6	3451017.7						
Heavy Metals															
Arsenic	mg/kg dry wt	5	4	13	11	5	5	5	6	17%	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.15	< 0.10	0.23	0.2	0.13	1.11	0.42	0.12	14%	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	12	25	20	15	13	14	15	26	29%	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	11	8	26	27	17	17	12	10	4%	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	28	19.5	173	167	65	69	36	23	4%	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	10	11	13	12	12	11	12	9	8%	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	81	55	145	142	79	570	320	83	2%	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS4@250	SS5@50	SS5@250	SS6@50	SS6@250	SS7@50	SS7@250	SS8@50	SS8@250	Soil Guideline Values				
Soil Results	Depth (mm)	250	50	250	50	250	50	250	50	250	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.8	3451017.9	3451017.1	3451017.11	3451017.12	3451017.13	3451017.14	3451017.15	3451017.16					
Heavy Metals															
Arsenic	mg/kg dry wt	6	5	5	7	5	12	11	5	5	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.12	0.16	0.12	0.13	< 0.10	0.13	0.13	0.13	0.14	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	16	14	15	16	15	18	15	14	15	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	14	17	13	15	11	17	28	11	16	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	37	380	48	40	24	43	42	23	36	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	10	11	12	11	12	11	11	10	11	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	94	151	102	103	90	96	91	76	107	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS9@50	SS9@250	SS10@50	DUP2	SS10@250	SS11@50	SS11@250	SS12@50	RPD	Soil Guideline Values				
Soil Results	Depth (mm)	50	250	50	50	250	50	250	50	DUP2 & SS10@50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.17	3451017.18	3451017.19	3451017.84	3451017.2	3451017.21	3451017.22	3451017.23						
Heavy Metals															
Arsenic	mg/kg dry wt	6	6	8	8	6	6	5	5	0%	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.14	0.13	0.15	0.15	0.14	0.17	0.12	0.14	0%	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	15	16	16	16	15	15	15	15	0%	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	16	19	14	14	15	17	14	16	0%	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	48	70	68	67	59	139	83	197	1%	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	11	12	12	12	12	11	12	11	0%	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	116	128	133	134	107	145	109	142	1%	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'commercial/industrial' guideline value
Indicates result exceeds ecological guideline value
Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
NEPM - National Environmental Protection Measures 2013, Formerly NEPC, Australia
ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high
Concentrations for "Regional, Recent" soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 64, 86 & 94 Barters Road, Templeton

Date of sampling: 24 January 2024



Analyte	Sample Name:	SS12@250	SS13@50	SS13@250	SS14@50	SS14@250	SS15@50	SS15@250	SS16@50	SS16@250	Soil Guideline Values				
Soil Results	Depth (mm)	250	50	250	50	250	50	250	50	250	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.24	3451017.25	3451017.26	3451017.27	3451017.28	3451017.29	3451017.3	3451017.31	3451017.32					
Heavy Metals															
Arsenic	mg/kg dry wt	5	7	6	7	6	6	6	9	6	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	< 0.10	0.19	0.11	0.29	0.28	0.18	0.12	0.23	< 0.10	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	16	16	15	16	16	16	14	17	15	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	13	21	17	16	13	17	16	24	11	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	69	210	90	92	59	147	112	31	46	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	13	12	12	12	12	10	11	10	11	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	104	169	126	420	290	147	104	220	96	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS17@50	SS17@250	SS18@50	SS18@250	SS19@50	SS19@250	SS20@50	SS20@250	SS21@50	Soil Guideline Values				
Soil Results	Depth (mm)	50	250	50	250	50	250	50	250	50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.33	3451017.34	3451017.35	3451017.36	3451017.37	3451017.38	3451017.39	3451017.4	3451017.41					
Heavy Metals															
Arsenic	mg/kg dry wt	6	6	6	6	5	6	5	5	7	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.14	< 0.10	0.64	0.54	< 0.10	< 0.10	0.11	< 0.10	0.12	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	15	16	15	15	15	15	14	15	15	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	15	8	15	13	9	9	10	8	9	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	53	20	100	67	21	50	128	68	53	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	12	13	11	12	11	12	12	11	10	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	143	77	580	530	57	80	94	67	76	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS21@250	SS22@50	SS22@250	SS23@50	SS23@250	SS24@50	SS24@250	SS25@50	RPD	Soil Guideline Values				
Soil Results	Depth (mm)	250	50	250	50	250	50	250	50	DUP3 & SS25@50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.42	3451017.43	3451017.44	3451017.45	3451017.46	3451017.47	3451017.48	3451017.49						
Heavy Metals															
Arsenic	mg/kg dry wt	5	7	6	6	5	8	6	9	0%	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	< 0.10	0.12	< 0.10	0.16	0.13	0.15	< 0.10	0.24	19%	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	14	16	16	16	15	16	16	18	0%	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	7	14	15	14	12	13	12	24	8%	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	26	41	34	330	184	42	41	220	24%	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	11	11	12	12	13	13	12	12	0%	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	59	83	72	155	130	99	93	240	4%	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'commercial/industrial' guideline value
Indicates result exceeds ecological guideline value
Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
NEPM - National Environmental Protection Measures 2013, Formerly NEPC, Australia
ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high
Concentrations for "Regional, Recent" soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 64, 86 & 94 Barters Road, Templeton

Date of sampling: 24 January 2024



Analyte	Sample Name:	DUP3	SS25@250	SS26@50	SS26@250	SS27@50	SS27@250	SS28@50	SS28@250	SS29@50	Soil Guideline Values				
Soil Results	Depth (mm)	50	250	50	250	50	250	50	250	50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.85	3451017.5	3451017.51	3451017.52	3451017.53	3451017.54	3451017.55	3451017.56	3451017.57					
Heavy Metals															
Arsenic	mg/kg dry wt	9	8	6	6	5	5	10	12	32	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.29	0.24	< 0.10	< 0.10	0.24	0.19	0.46	0.43	0.28	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	18	18	15	17	15	15	16	17	27	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	26	24	11	13	29	15	27	45	42	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	280	270	36	40	54	47	178	140	550	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	12	12	11	13	11	11	12	12	12	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	250	210	75	74	125	116	410	340	400	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS29@250	SS30@50	SS30@250	SS31@50	SS31@250	SS32@50	SS32@250	SS33@100	SS33@250	Soil Guideline Values				
Soil Results	Depth (mm)	250	50	250	50	250	50	250	100	250	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.58	3451017.59	3451017.6	3451017.61	3451017.62	3451017.63	3451017.64	3451017.65	3451017.66					
Heavy Metals															
Arsenic	mg/kg dry wt	27	5	5	10	6	7	7	8	6	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.24	0.16	0.11	0.32	0.15	0.18	0.13	0.29	0.26	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	22	15	16	20	15	14	14	16	15	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	32	14	12	27	16	18	15	22	17	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	250	56	45	80	49	220	78	179	141	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	12	12	12	13	11	10	10	11	12	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	370	102	83	210	137	134	96	260	240	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS34@50	DUP4	SS34@250	SS35@50	SS35@250	SS36@50	SS36@250	SS37@50	RPD	Soil Guideline Values				
Soil Results	Depth (mm)	50	50	250	50	250	50	250	50	DUP4 & SS34@50	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.67	3451017.86	3451017.68	3451017.69	3451017.7	3451017.71	3451017.72	3451017.73						
Heavy Metals															
Arsenic	mg/kg dry wt	6	6	9	7	7	6	7	16	0%	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.14	0.12	0.2	< 0.10	0.28	< 0.10	0.21	1.06	15%	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	15	16	18	15	17	16	18	22	6%	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	29	28	38	19	28	14	28	600	4%	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	55	57	72	36	126	73	76	280	4%	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	13	13	12	13	14	12	12	13	0%	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	102	100	112	87	330	138	390	450	2%	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'commercial/industrial' guideline value
Indicates result exceeds ecological guideline value
Indicates result exceeds background value for soil type

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Concentrations for "Regional, Recent" soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 64, 86 & 94 Barters Road, Templeton

Date of sampling: 24 January 2024



Analyte	Sample Name:	SS37@250	SS38@50	SS38@250	SS39@50	SS39@250	SS40@50	SS40@250	SS41@50	SS41@250	Soil Guideline Values				
Soil Results	Depth (mm)	250	50	250	50	250	50	250	50	250	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.74	3451017.75	3451017.76	3451017.77	3451017.78	3451017.79	3451017.8	3451017.81	3451017.82					
Heavy Metals															
Arsenic	mg/kg dry wt	14	4	11	6	10	5	5	5	5	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.44	< 0.10	0.13	0.17	0.41	0.13	0.1	0.11	< 0.10	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	24	12	16	15	19	14	15	15	15	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	56	8	16	15	23	10	10	10	9	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	183	22	85	49	102	33	32	28	24	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	12	9	12	11	10	11	12	12	12	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	260	45	111	147	380	76	72	81	72	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	BP1@50	BP2@50	SP1	SP2	SP3	SP4	SP5	SP6	SP7	Soil Guideline Values				
Soil Results	Depth (mm)	50	50	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.87	3451017.88	3451017.89	3451017.9	3451017.91	3451017.92	3451017.93	3451017.94	3451017.95					
Heavy Metals															
Arsenic	mg/kg dry wt	69	179	12	9	12	7	8	7	8	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	10.8	0.65	0.12	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	90	111	15	16	13	14	13	14	16	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	5,900	380	14	11	10	10	7	11	12	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	600	59	64	28	28	36	72	46	33	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	45	17	10	13	10	11	10	10	12	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	1,850	950	102	105	68	80	67	93	86	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15	SP16	Soil Guideline Values				
Soil Results	Depth (mm)	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background
	Lab Number:	3451017.96	3451017.97	3451017.98	3451017.99	3451017.1	3451017.101	3451017.102	3451017.103	3451017.104					
Heavy Metals															
Arsenic	mg/kg dry wt	6	7	8	7	6	7	9	7	11	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	< 0.10	0.11	0.14	< 0.10	< 0.10	0.11	< 0.10	< 0.10	0.1	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	14	16	14	14	14	15	15	16	14	6,300	NES	370	ANZWQ	22.70
Copper	mg/kg dry wt	9	11	13	12	10	11	13	10	13	>10,000	NES	270	ANZWQ	20.30
Lead	mg/kg dry wt	24	31	44	68	24	52	34	66	53	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	10	11	10	10	12	10	11	11	10	6,000	NEPM	52	ANZWQ	20.70
Zinc	mg/kg dry wt	71	80	108	93	59	91	71	81	90	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'commercial/industrial' guideline value

Indicates result exceeds ecological guideline value

Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

NEPM - National Environmental Protection Measures 2013, Formerly NEPC, Australia

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high

Concentrations for "Regional, Recent" soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of XRF Results - 64, 86 & 94 Barters Road, Templeton

Date of testing: 22 & 24 January 2024

Units: ppm



XRF Reading No	Description	Sample Depth (mm)	Date	Time	Test Duration (secs)	Total Recoverable Arsenic		Total Recoverable Lead		Total Recoverable Zinc	
						Result	Error	Result	Error	Result	Error
1	Calibration Test	0	22/01/2024	11:46:27	40	487	5	491	5	82	3
2	Calibration Test	0	22/01/2024	11:47:35	40	9	1	16	1	111	2
3	Blank	0	22/01/2024	11:48:46	40	<LOD	3	<LOD	4	<LOD	7
4	86 Barters Road - burn area	0	22/01/2024	11:51:00	40	5	1	55	1	278	3
5	86 Barters Road - burn area	0	22/01/2024	11:51:54	40	6	1	55	1	495	5
6	86 Barters Road - burn area	0	22/01/2024	12:34:19	40	22	1	18	1	399	4
7	86 Barters Road - burn area	0	22/01/2024	12:35:24	40	10	1	8	1	141	2
8	86 Barters Road - burn area	0	22/01/2024	12:36:43	40	7	1	7	1	94	2
9	86 Barters Road - burn area	0	22/01/2024	12:37:50	40	4	1	8	1	161	2
10	86 Barters Road - burn area	0	22/01/2024	12:38:56	40	21	1	11	1	184	2
11	86 Barters Road - burn area	0	22/01/2024	12:40:14	40	14	1	16	1	114	2
12	86 Barters Road - burn area	0	22/01/2024	12:41:10	40	67	1	47	1	268	3
13	86 Barters Road - burn area	0	22/01/2024	12:42:08	40	80	2	328	2	1095	6
14	86 Barters Road - burn area	0	22/01/2024	12:44:30	40	18	1	22	1	125	2
15	86 Barters Road - burn area	0	22/01/2024	12:45:47	40	35	1	23	1	110	2
16	86 Barters Road - burn area	0	22/01/2024	12:47:10	40	28	1	14	1	105	2
1	Calibration Test	0	24/01/2024	11:00:42	40	485	5	463	5	84	3
2	Calibration Test	0	24/01/2024	11:01:42	40	11	1	15	1	107	3
3	Blank	0	24/01/2024	11:02:53	40	<LOD	3	<LOD	4	<LOD	6
4	94 Barters Road - burn area	0	24/01/2024	11:10:25	40	13	1	15	1	192	2
5	94 Barters Road - burn area	0	24/01/2024	11:13:57	40	5	1	10	1	74	2
6	94 Barters Road - burn area	0	24/01/2024	11:15:08	40	61	1	9	1	599	5
7	Blank	0	24/01/2024	11:34:19	40	<LOD	4	<LOD	5	<LOD	8
Soil Guideline Values	Commercial/Industrial Outdoor Worker SGV					70 _{NES}		3300 _{NES}		400000 _{NEPM}	
	Ecological Guideline Values (ANZWQ)					70		3,300		410	

Result exceeds 'commercial/industrial' SGV
Indicates result exceeds ecological guideline value

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
NEPM - National Environmental Protection Measures 2013, Australia
ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high

Appendix D – Laboratory Reports

Certificate of Analysis

Page 1 of 4

Client:	Momentum Environmental Limited	Lab No:	3451016	A2Pv1
Contact:	Nicola Peacock C/- Momentum Environmental Limited 19 Robertsons Road Kirwee 7671	Date Received:	24-Jan-2024	
		Date Reported:	25-Jan-2024	
		Quote No:	72157	
		Order No:		
		Client Reference:	817 - Barbers Road	
		Submitted By:	Nicola Peacock	

Sample Type: Soil

Sample Name:	SS42A@50 24-Jan-2024 11:58 am	SP1A 24-Jan-2024 9:20 am	SP2A 24-Jan-2024 9:30 am	SP3A 24-Jan-2024 9:42 am	SP4A 24-Jan-2024 9:52 am
Lab Number:	3451016.1	3451016.2	3451016.3	3451016.4	3451016.5
Asbestos Presence / Absence	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form	-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w < 0.001	% 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 619.4	g 706.5	g 464.1	g 568.3	g 630.7
Dry Weight	g 504.9	g 618.4	g 389.5	g 505.6	g 565.9
Moisture*	% 18	% 12	% 16	% 11	% 10
Sample Fraction >10mm	g dry wt 6.5	g dry wt 31.5	g dry wt 69.5	g dry wt 80.4	g dry wt 99.5
Sample Fraction <10mm to >2mm	g dry wt 30.5	g dry wt 170.6	g dry wt 137.1	g dry wt 200.7	g dry wt 156.7
Sample Fraction <2mm	g dry wt 467.2	g dry wt 416.0	g dry wt 182.5	g dry wt 224.2	g dry wt 309.4
<2mm Subsample Weight	g dry wt 56.4	g dry wt 53.8	g dry wt 57.5	g dry wt 55.9	g dry wt 56.1
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	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:	SP5A 24-Jan-2024 11:06 am	SP6A 24-Jan-2024 11:05 am	SP7A 24-Jan-2024 11:17 am	SP8A 24-Jan-2024 11:19 am	SP9A 24-Jan-2024 11:29 am
Lab Number:	3451016.6	3451016.7	3451016.8	3451016.9	3451016.10
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 669.2	g 783.0	g 539.3	g 764.6	g 714.5
Dry Weight	g 609.0	g 686.5	g 474.8	g 689.6	g 635.9



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.

Sample Type: Soil					
Sample Name:		SP5A 24-Jan-2024 11:06 am	SP6A 24-Jan-2024 11:05 am	SP7A 24-Jan-2024 11:17 am	SP8A 24-Jan-2024 11:19 am
Lab Number:		3451016.6	3451016.7	3451016.8	3451016.9
Moisture*	%	9	12	12	10
Sample Fraction >10mm	g dry wt	69.1	60.3	18.6	73.1
Sample Fraction <10mm to >2mm	g dry wt	136.2	138.5	118.9	153.7
Sample Fraction <2mm	g dry wt	403.4	487.5	336.8	462.2
<2mm Subsample Weight	g dry wt	52.7	58.5	52.7	52.5
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		SP10A 24-Jan-2024 11:32 am	SP11A 24-Jan-2024 11:42 am	SP12A 24-Jan-2024 11:41 am	SP13A 24-Jan-2024 10:40 am
Lab Number:		3451016.11	3451016.12	3451016.13	3451016.14
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	563.2	620.6	734.0	729.4
Dry Weight	g	496.2	543.7	641.9	654.5
Moisture*	%	12	12	13	10
Sample Fraction >10mm	g dry wt	67.0	60.1	100.8	109.3
Sample Fraction <10mm to >2mm	g dry wt	104.9	157.6	152.4	190.2
Sample Fraction <2mm	g dry wt	323.6	325.5	387.7	354.8
<2mm Subsample Weight	g dry wt	57.6	56.2	56.8	54.9
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		SP15A 24-Jan-2024 10:18 am	SP16A 24-Jan-2024 10:08 am
Lab Number:		3451016.16	3451016.17
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001
As Received Weight	g	512.3	509.4
Dry Weight	g	432.5	435.3
Moisture*	%	16	15
Sample Fraction >10mm	g dry wt	35.5	8.2
Sample Fraction <10mm to >2mm	g dry wt	83.8	141.6
Sample Fraction <2mm	g dry wt	312.7	285.3

Sample Type: Soil			
Sample Name:		SP15A 24-Jan-2024 10:18 am	SP16A 24-Jan-2024 10:08 am
Lab Number:		3451016.16	3451016.17
<2mm Subsample Weight	g dry wt	55.8	59.2
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001

Glossary of Terms

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

For further details, please contact the Asbestos Team.

Please refer to the **BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil**.

<https://www.branz.co.nz/asbestos>

The following assumptions have been made:

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

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

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill 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	1-17
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	1-17
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-17
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	1-17
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	1-17
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	1-17
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%	1-17
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-17
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	1-17
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-17

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
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	1-17
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-17
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	1-17
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-17
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-17

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

Testing was completed on 25-Jan-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.



Rhodri Williams BSc (Hons)
Technical Manager - Asbestos

Certificate of Analysis

Page 1 of 8

Client:	Momentum Environmental Limited	Lab No:	3451017	SPV1
Contact:	Nicola Peacock	Date Received:	24-Jan-2024	
	C/- Momentum Environmental Limited	Date Reported:	30-Jan-2024	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	817 - Barters Road	
		Submitted By:	Nicola Peacock	

Sample Type: Soil

Sample Name:	SS1@50	SS1@250	SS2@50	SS2@250	SS3@50
	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024
Lab Number:	3451017.1	3451017.2	3451017.3	3451017.4	3451017.5

Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	13	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.15	< 0.10	0.23	0.13	1.11
Total Recoverable Chromium	mg/kg dry wt	12	25	20	13	14
Total Recoverable Copper	mg/kg dry wt	11	8	26	17	17
Total Recoverable Lead	mg/kg dry wt	28	19.5	173	65	69
Total Recoverable Nickel	mg/kg dry wt	10	11	13	12	11
Total Recoverable Zinc	mg/kg dry wt	81	55	145	79	570

Sample Name:	SS3@250	SS4@50	SS4@250	SS5@50	SS5@250
	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024
Lab Number:	3451017.6	3451017.7	3451017.8	3451017.9	3451017.10

Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	6	6	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.42	0.12	0.12	0.16	0.12
Total Recoverable Chromium	mg/kg dry wt	15	26	16	14	15
Total Recoverable Copper	mg/kg dry wt	12	10	14	17	13
Total Recoverable Lead	mg/kg dry wt	36	23	37	380	48
Total Recoverable Nickel	mg/kg dry wt	12	9	10	11	12
Total Recoverable Zinc	mg/kg dry wt	320	83	94	151	102

Sample Name:	SS6@50	SS6@250	SS7@50	SS7@250	SS8@50
	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024
Lab Number:	3451017.11	3451017.12	3451017.13	3451017.14	3451017.15

Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	5	12	11	5
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	0.13	0.13	0.13
Total Recoverable Chromium	mg/kg dry wt	16	15	18	15	14
Total Recoverable Copper	mg/kg dry wt	15	11	17	28	11
Total Recoverable Lead	mg/kg dry wt	40	24	43	42	23
Total Recoverable Nickel	mg/kg dry wt	11	12	11	11	10
Total Recoverable Zinc	mg/kg dry wt	103	90	96	91	76

Sample Name:	SS8@250	SS9@50	SS9@250	SS10@50	SS10@250
	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024	22-Jan-2024
Lab Number:	3451017.16	3451017.17	3451017.18	3451017.19	3451017.20

Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	6	6	8	6
Total Recoverable Cadmium	mg/kg dry wt	0.14	0.14	0.13	0.15	0.14
Total Recoverable Chromium	mg/kg dry wt	15	15	16	16	15
Total Recoverable Copper	mg/kg dry wt	16	16	19	14	15
Total Recoverable Lead	mg/kg dry wt	36	48	70	68	59



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Sample Type: Soil						
Sample Name:		SS8@250 22-Jan-2024	SS9@50 22-Jan-2024	SS9@250 22-Jan-2024	SS10@50 22-Jan-2024	SS10@250 22-Jan-2024
Lab Number:		3451017.16	3451017.17	3451017.18	3451017.19	3451017.20
Heavy Metals, Screen Level						
Total Recoverable Nickel	mg/kg dry wt	11	11	12	12	12
Total Recoverable Zinc	mg/kg dry wt	107	116	128	133	107
Sample Name:		SS11@50 22-Jan-2024	SS11@250 22-Jan-2024	SS12@50 22-Jan-2024	SS12@250 22-Jan-2024	SS13@50 22-Jan-2024
Lab Number:		3451017.21	3451017.22	3451017.23	3451017.24	3451017.25
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	5	5	5	7
Total Recoverable Cadmium	mg/kg dry wt	0.17	0.12	0.14	< 0.10	0.19
Total Recoverable Chromium	mg/kg dry wt	15	15	15	16	16
Total Recoverable Copper	mg/kg dry wt	17	14	16	13	21
Total Recoverable Lead	mg/kg dry wt	139	83	197	69	210
Total Recoverable Nickel	mg/kg dry wt	11	12	11	13	12
Total Recoverable Zinc	mg/kg dry wt	145	109	142	104	169
Sample Name:		SS13@250 22-Jan-2024	SS14@50 22-Jan-2024	SS14@250 22-Jan-2024	SS15@50 22-Jan-2024	SS15@250 22-Jan-2024
Lab Number:		3451017.26	3451017.27	3451017.28	3451017.29	3451017.30
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	7	6	6	6
Total Recoverable Cadmium	mg/kg dry wt	0.11	0.29	0.28	0.18	0.12
Total Recoverable Chromium	mg/kg dry wt	15	16	16	16	14
Total Recoverable Copper	mg/kg dry wt	17	16	13	17	16
Total Recoverable Lead	mg/kg dry wt	90	92	59	147	112
Total Recoverable Nickel	mg/kg dry wt	12	12	12	10	11
Total Recoverable Zinc	mg/kg dry wt	126	420	290	147	104
Sample Name:		SS16@50 22-Jan-2024	SS16@250 22-Jan-2024	SS17@50 22-Jan-2024	SS17@250 22-Jan-2024	SS18@50 22-Jan-2024
Lab Number:		3451017.31	3451017.32	3451017.33	3451017.34	3451017.35
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	9	6	6	6	6
Total Recoverable Cadmium	mg/kg dry wt	0.23	< 0.10	0.14	< 0.10	0.64
Total Recoverable Chromium	mg/kg dry wt	17	15	15	16	15
Total Recoverable Copper	mg/kg dry wt	24	11	15	8	15
Total Recoverable Lead	mg/kg dry wt	31	46	53	20	100
Total Recoverable Nickel	mg/kg dry wt	10	11	12	13	11
Total Recoverable Zinc	mg/kg dry wt	220	96	143	77	580
Sample Name:		SS18@250 22-Jan-2024	SS19@50 22-Jan-2024	SS19@250 22-Jan-2024	SS20@50 22-Jan-2024	SS20@250 22-Jan-2024
Lab Number:		3451017.36	3451017.37	3451017.38	3451017.39	3451017.40
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	5	6	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.54	< 0.10	< 0.10	0.11	< 0.10
Total Recoverable Chromium	mg/kg dry wt	15	15	15	14	15
Total Recoverable Copper	mg/kg dry wt	13	9	9	10	8
Total Recoverable Lead	mg/kg dry wt	67	21	50	128	68
Total Recoverable Nickel	mg/kg dry wt	12	11	12	12	11
Total Recoverable Zinc	mg/kg dry wt	530	57	80	94	67
Sample Name:		SS21@50 22-Jan-2024	SS21@250 22-Jan-2024	SS22@50 22-Jan-2024	SS22@250 22-Jan-2024	SS23@50 22-Jan-2024
Lab Number:		3451017.41	3451017.42	3451017.43	3451017.44	3451017.45
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	5	7	6	6
Total Recoverable Cadmium	mg/kg dry wt	0.12	< 0.10	0.12	< 0.10	0.16
Total Recoverable Chromium	mg/kg dry wt	15	14	16	16	16
Total Recoverable Copper	mg/kg dry wt	9	7	14	15	14

Sample Type: Soil						
Sample Name:		SS21@50 22-Jan-2024	SS21@250 22-Jan-2024	SS22@50 22-Jan-2024	SS22@250 22-Jan-2024	SS23@50 22-Jan-2024
Lab Number:		3451017.41	3451017.42	3451017.43	3451017.44	3451017.45
Heavy Metals, Screen Level						
Total Recoverable Lead	mg/kg dry wt	53	26	41	34	330
Total Recoverable Nickel	mg/kg dry wt	10	11	11	12	12
Total Recoverable Zinc	mg/kg dry wt	76	59	83	72	155
Sample Name:		SS23@250 22-Jan-2024	SS24@50 22-Jan-2024	SS24@250 22-Jan-2024	SS25@50 22-Jan-2024	SS25@250 22-Jan-2024
Lab Number:		3451017.46	3451017.47	3451017.48	3451017.49	3451017.50
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	8	6	9	8
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.15	< 0.10	0.24	0.24
Total Recoverable Chromium	mg/kg dry wt	15	16	16	18	18
Total Recoverable Copper	mg/kg dry wt	12	13	12	24	24
Total Recoverable Lead	mg/kg dry wt	184	42	41	220	270
Total Recoverable Nickel	mg/kg dry wt	13	13	12	12	12
Total Recoverable Zinc	mg/kg dry wt	130	99	93	240	210
Sample Name:		SS26@50 22-Jan-2024	SS26@250 22-Jan-2024	SS27@50 22-Jan-2024	SS27@250 22-Jan-2024	SS28@50 22-Jan-2024
Lab Number:		3451017.51	3451017.52	3451017.53	3451017.54	3451017.55
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	6	5	5	10
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	0.24	0.19	0.46
Total Recoverable Chromium	mg/kg dry wt	15	17	15	15	16
Total Recoverable Copper	mg/kg dry wt	11	13	29	15	27
Total Recoverable Lead	mg/kg dry wt	36	40	54	47	178
Total Recoverable Nickel	mg/kg dry wt	11	13	11	11	12
Total Recoverable Zinc	mg/kg dry wt	75	74	125	116	410
Sample Name:		SS28@250 22-Jan-2024	SS29@50 24-Jan-2024	SS29@250 24-Jan-2024	SS30@50 24-Jan-2024	SS30@250 24-Jan-2024
Lab Number:		3451017.56	3451017.57	3451017.58	3451017.59	3451017.60
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	12	32	27	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.43	0.28	0.24	0.16	0.11
Total Recoverable Chromium	mg/kg dry wt	17	27	22	15	16
Total Recoverable Copper	mg/kg dry wt	45	42	32	14	12
Total Recoverable Lead	mg/kg dry wt	140	550	250	56	45
Total Recoverable Nickel	mg/kg dry wt	12	12	12	12	12
Total Recoverable Zinc	mg/kg dry wt	340	400	370	102	83
Sample Name:		SS31@50 24-Jan-2024	SS31@250 24-Jan-2024	SS32@50 24-Jan-2024	SS32@250 24-Jan-2024	SS33@100 24-Jan-2024
Lab Number:		3451017.61	3451017.62	3451017.63	3451017.64	3451017.65
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	10	6	7	7	8
Total Recoverable Cadmium	mg/kg dry wt	0.32	0.15	0.18	0.13	0.29
Total Recoverable Chromium	mg/kg dry wt	20	15	14	14	16
Total Recoverable Copper	mg/kg dry wt	27	16	18	15	22
Total Recoverable Lead	mg/kg dry wt	80	49	220	78	179
Total Recoverable Nickel	mg/kg dry wt	13	11	10	10	11
Total Recoverable Zinc	mg/kg dry wt	210	137	134	96	260
Sample Name:		SS33@250 24-Jan-2024	SS34@50 24-Jan-2024	SS34@250 24-Jan-2024	SS35@50 24-Jan-2024	SS35@250 24-Jan-2024
Lab Number:		3451017.66	3451017.67	3451017.68	3451017.69	3451017.70
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	6	9	7	7
Total Recoverable Cadmium	mg/kg dry wt	0.26	0.14	0.20	< 0.10	0.28
Total Recoverable Chromium	mg/kg dry wt	15	15	18	15	17

Sample Type: Soil						
Sample Name:		SS33@250 24-Jan-2024	SS34@50 24-Jan-2024	SS34@250 24-Jan-2024	SS35@50 24-Jan-2024	SS35@250 24-Jan-2024
Lab Number:		3451017.66	3451017.67	3451017.68	3451017.69	3451017.70
Heavy Metals, Screen Level						
Total Recoverable Copper	mg/kg dry wt	17	29	38	19	28
Total Recoverable Lead	mg/kg dry wt	141	55	72	36	126
Total Recoverable Nickel	mg/kg dry wt	12	13	12	13	14
Total Recoverable Zinc	mg/kg dry wt	240	102	112	87	330
Sample Name:		SS36@50 24-Jan-2024	SS36@250 24-Jan-2024	SS37@50 24-Jan-2024	SS37@250 24-Jan-2024	SS38@50 24-Jan-2024
Lab Number:		3451017.71	3451017.72	3451017.73	3451017.74	3451017.75
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	7	16	14	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.21	1.06	0.44	< 0.10
Total Recoverable Chromium	mg/kg dry wt	16	18	22	24	12
Total Recoverable Copper	mg/kg dry wt	14	28	600	56	8
Total Recoverable Lead	mg/kg dry wt	73	76	280	183	22
Total Recoverable Nickel	mg/kg dry wt	12	12	13	12	9
Total Recoverable Zinc	mg/kg dry wt	138	390	450	260	45
Sample Name:		SS38@250 24-Jan-2024	SS39@50 24-Jan-2024	SS39@250 24-Jan-2024	SS40@50 24-Jan-2024	SS40@250 24-Jan-2024
Lab Number:		3451017.76	3451017.77	3451017.78	3451017.79	3451017.80
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	11	6	10	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.17	0.41	0.13	0.10
Total Recoverable Chromium	mg/kg dry wt	16	15	19	14	15
Total Recoverable Copper	mg/kg dry wt	16	15	23	10	10
Total Recoverable Lead	mg/kg dry wt	85	49	102	33	32
Total Recoverable Nickel	mg/kg dry wt	12	11	10	11	12
Total Recoverable Zinc	mg/kg dry wt	111	147	380	76	72
Sample Name:		SS41@50 24-Jan-2024	SS41@250 24-Jan-2024	Dup1 22-Jan-2024	Dup2 22-Jan-2024	Dup3 22-Jan-2024
Lab Number:		3451017.81	3451017.82	3451017.83	3451017.84	3451017.85
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	5	11	8	9
Total Recoverable Cadmium	mg/kg dry wt	0.11	< 0.10	0.2	0.15	0.29
Total Recoverable Chromium	mg/kg dry wt	15	15	15	16	18
Total Recoverable Copper	mg/kg dry wt	10	9	27	14	26
Total Recoverable Lead	mg/kg dry wt	28	24	167	67	280
Total Recoverable Nickel	mg/kg dry wt	12	12	12	12	12
Total Recoverable Zinc	mg/kg dry wt	81	72	142	134	250
Sample Name:		Dup4 24-Jan-2024	BP1@50 22-Jan-2024	BP2@50 24-Jan-2024	SP1 24-Jan-2024	SP2 24-Jan-2024
Lab Number:		3451017.86	3451017.87	3451017.88	3451017.89	3451017.90
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	69	179	12	9
Total Recoverable Cadmium	mg/kg dry wt	0.12	10.8	0.65	0.12	< 0.10
Total Recoverable Chromium	mg/kg dry wt	16	90	111	15	16
Total Recoverable Copper	mg/kg dry wt	28	5,900	380	14	11
Total Recoverable Lead	mg/kg dry wt	57	600	59	64	28
Total Recoverable Nickel	mg/kg dry wt	13	45	17	10	13
Total Recoverable Zinc	mg/kg dry wt	100	1,850	950	102	105
Sample Name:		SP3 24-Jan-2024	SP4 24-Jan-2024	SP5 24-Jan-2024	SP6 24-Jan-2024	SP7 24-Jan-2024
Lab Number:		3451017.91	3451017.92	3451017.93	3451017.94	3451017.95
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	12	7	8	7	8
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.11	< 0.10
Total Recoverable Chromium	mg/kg dry wt	13	14	13	14	16

Sample Type: Soil						
Sample Name:		SP3 24-Jan-2024	SP4 24-Jan-2024	SP5 24-Jan-2024	SP6 24-Jan-2024	SP7 24-Jan-2024
Lab Number:		3451017.91	3451017.92	3451017.93	3451017.94	3451017.95
Heavy Metals, Screen Level						
Total Recoverable Copper	mg/kg dry wt	10	10	7	11	12
Total Recoverable Lead	mg/kg dry wt	28	36	72	46	33
Total Recoverable Nickel	mg/kg dry wt	10	11	10	10	12
Total Recoverable Zinc	mg/kg dry wt	68	80	67	93	86
Sample Name:		SP8 24-Jan-2024	SP9 24-Jan-2024	SP10 24-Jan-2024	SP11 24-Jan-2024	SP12 24-Jan-2024
Lab Number:		3451017.96	3451017.97	3451017.98	3451017.99	3451017.100
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	7	8	7	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.11	0.14	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	14	16	14	14	14
Total Recoverable Copper	mg/kg dry wt	9	11	13	12	10
Total Recoverable Lead	mg/kg dry wt	24	31	44	68	24
Total Recoverable Nickel	mg/kg dry wt	10	11	10	10	12
Total Recoverable Zinc	mg/kg dry wt	71	80	108	93	59
Sample Name:		SP13 24-Jan-2024	SP14 24-Jan-2024	SP15 24-Jan-2024	SP16 24-Jan-2024	Composite of SS6@50, SS10@50, SS11@50 & SS14@50
Lab Number:		3451017.101	3451017.102	3451017.103	3451017.104	3451017.105
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	-	-	84
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	9	7	11	-
Total Recoverable Cadmium	mg/kg dry wt	0.11	< 0.10	< 0.10	0.10	-
Total Recoverable Chromium	mg/kg dry wt	15	15	16	14	-
Total Recoverable Copper	mg/kg dry wt	11	13	10	13	-
Total Recoverable Lead	mg/kg dry wt	52	34	66	53	-
Total Recoverable Nickel	mg/kg dry wt	10	11	11	10	-
Total Recoverable Zinc	mg/kg dry wt	91	71	81	90	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	-	-	< 0.012
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.012
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.012
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.012
cis-Chlordane	mg/kg dry wt	-	-	-	-	< 0.012
trans-Chlordane	mg/kg dry wt	-	-	-	-	< 0.012
2,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.012
2,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.012
2,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.012
Total DDT Isomers	mg/kg dry wt	-	-	-	-	< 0.07
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.012
Endosulfan I	mg/kg dry wt	-	-	-	-	< 0.012
Endosulfan II	mg/kg dry wt	-	-	-	-	< 0.012
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 0.012
Endrin	mg/kg dry wt	-	-	-	-	< 0.012
Endrin aldehyde	mg/kg dry wt	-	-	-	-	< 0.012
Endrin ketone	mg/kg dry wt	-	-	-	-	< 0.012
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.012
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.012
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.012

Sample Type: Soil						
Sample Name:		SP13 24-Jan-2024	SP14 24-Jan-2024	SP15 24-Jan-2024	SP16 24-Jan-2024	Composite of SS6@50, SS10@50, SS11@50 & SS14@50
Lab Number:		3451017.101	3451017.102	3451017.103	3451017.104	3451017.105
Organochlorine Pesticides Screening in Soil						
Methoxychlor	mg/kg dry wt	-	-	-	-	< 0.012
Sample Name:		Composite of SS8@50, SS9@50, SS12@50 & SS13@50	Composite of SS6@250, SS10@250, SS11@250 & SS14@250	Composite of SS8@250, SS9@250, SS12@250 & SS13@250	Composite of SS36@50, SS37@50, SS38@50 & SS39@50	Composite of SS36@250, SS37@250, SS38@250 & SS39@250
Lab Number:		3451017.106	3451017.107	3451017.108	3451017.109	3451017.110
Individual Tests						
Dry Matter	g/100g as rcvd	85	86	86	86	86
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
alpha-BHC	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
beta-BHC	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
delta-BHC	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
cis-Chlordane	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
trans-Chlordane	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
2,4'-DDD	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
4,4'-DDD	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
2,4'-DDE	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
4,4'-DDE	mg/kg dry wt	0.030	< 0.012	< 0.012	< 0.012	< 0.012
2,4'-DDT	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
4,4'-DDT	mg/kg dry wt	0.011	< 0.012	< 0.012	< 0.012	< 0.012
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	0.052	< 0.012	0.064	< 0.012	< 0.012
Endosulfan I	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Endosulfan II	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Endosulfan sulphate	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Endrin	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Endrin aldehyde	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Endrin ketone	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Heptachlor	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Heptachlor epoxide	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Hexachlorobenzene	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Methoxychlor	mg/kg dry wt	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
Sample Name:		Composite of SP1, SP2, SP3 & SP4	Composite of SP5, SP6, SP7 & SP8	Composite of SP9, SP10, SP11 & SP12	Composite of SP13, SP14, SP15 & SP16	
Lab Number:		3451017.111	3451017.112	3451017.113	3451017.114	
Individual Tests						
Dry Matter	g/100g as rcvd	85	89	86	86	
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	0.6	0.5	7.3	1.2	
1-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	
2-Methylnaphthalene	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	
Acenaphthylene	mg/kg dry wt	< 0.012	< 0.011	0.037	0.015	
Acenaphthene	mg/kg dry wt	< 0.012	< 0.011	0.024	< 0.012	
Anthracene	mg/kg dry wt	< 0.012	< 0.011	0.199	< 0.012	
Benzo[a]anthracene	mg/kg dry wt	0.040	0.032	0.54	0.081	
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.055	0.041	0.54	0.121	
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.080	0.061	0.81	0.177	
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.080	0.061	0.79	0.175	

Sample Type: Soil					
Sample Name:		Composite of SP1, SP2, SP3 & SP4	Composite of SP5, SP6, SP7 & SP8	Composite of SP9, SP10, SP11 & SP12	Composite of SP13, SP14, SP15 & SP16
Lab Number:		3451017.111	3451017.112	3451017.113	3451017.114
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.062	0.050	0.60	0.146
Benzo[e]pyrene	mg/kg dry wt	0.036	0.030	0.30	0.079
Benzo[g,h,i]perylene	mg/kg dry wt	0.039	0.033	0.36	0.090
Benzo[k]fluoranthene	mg/kg dry wt	0.026	0.018	0.23	0.050
Chrysene	mg/kg dry wt	0.044	0.034	0.47	0.085
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.012	< 0.011	0.070	0.016
Fluoranthene	mg/kg dry wt	0.089	0.068	1.33	0.153
Fluorene	mg/kg dry wt	< 0.012	< 0.011	0.035	< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.043	0.035	0.40	0.104
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt	0.014	< 0.011	0.129	0.028
Phenanthrene	mg/kg dry wt	0.044	0.030	0.74	0.050
Pyrene	mg/kg dry wt	0.089	0.069	1.32	0.163

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%.	-	1-104
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	111-114
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	1-104
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	105-110
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	111-114
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	105-114
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	11-12, 15-28, 71-78, 89-104
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	111-114
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	111-114

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

Testing was completed between 25-Jan-2024 and 30-Jan-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.



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

Certificate of Analysis

Page 1 of 2

Client:	Momentum Environmental Limited	Lab No:	3451028	A2Pv1
Contact:	Nicola Peacock	Date Received:	24-Jan-2024	
	C/- Momentum Environmental Limited	Date Reported:	25-Jan-2024	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	817- Barbers Road	
		Submitted By:	Nicola Peacock	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
Bulk-64 Barbers	3451028.1	Fibre Cement	15.66	Chrysotile (White Asbestos) detected.	N/A
Bulk 1 @ SP3	3451028.2	Fibre Cement	13.34	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.	N/A

Glossary of Terms

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

For further details, please contact the Asbestos Team.

Summary of Methods

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

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-2
Sample Weight on receipt	Sample weight (approximate). Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.01 g	1-2
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%	1-2
Description of Asbestos in Non Homogeneous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-2



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

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

Testing was completed on 25-Jan-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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Rhodri Williams BSc (Hons)
Technical Manager - Asbestos



**Soil Contamination Risk
Preliminary Site Investigation Report**

**44, 22 & 30 Hasketts Road,
Templeton, Canterbury**

Revision 1

August 2024



www.momentumenviro.co.nz

Specialist soil contamination experts, keeping your project moving.

QUALITY CONTROL AND CERTIFICATION SHEET

Client: NTP Holdings Ltd

Date of issue: 12 August 2024

Version: R1 – report amended to include limited sampling within asbestos risk areas

Report written by:

Fran Hobkirk, Environmental Scientist, BSc.
(7 years contaminated land experience)

Signed:

[Redacted Signature]

[Redacted Name]
[Redacted Title]

Report reviewed and certified as a Suitably Qualified and Experienced Practitioner by:

Nicola Peacock, Principal Environmental Engineer, NZCE, CEnvP
(15 years contaminated land experience within 31 years environmental experience)

[Redacted Signature]

[Redacted Name]
[Redacted Title]



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E	Table of XRF Results
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1 Executive Summary

The subject site consists of three rural residential lots with street addresses 4, 22 and 30 Hasketts, Templeton, Canterbury. Momentum Environmental Ltd (MEL) were engaged to undertake an assessment of the likelihood of soil contamination being present under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCSCS) for the purposes of pre-purchase due diligence. If the subject site is purchased by the client, it is proposed to develop the subject site for industrial use. This will involve a change in land use and possible future subdivision and soil disturbance activities. It is also noted that Momentum Environmental Ltd is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016. This report details the work undertaken to assess the risks.

This Preliminary Site Investigation (PSI) has identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site and there may be a risk to human health from contaminated soils. The following HAIL activity has been identified:

- Possible heavy metal contamination within existing and possible former burn areas (HAIL I).

It is recommended that a Detailed Site Investigation, in terms of the Ministry for the Environment's Contaminated Land Management Guidelines, be undertaken on the identified risk areas prior to development. These areas are shown on the Site Inspection and Risk Area Plan in **Appendix D** of this report.

In terms of planning status, the Preliminary Site Investigation has identified evidence of HAIL activities occurring on the subject site. Therefore, the NESCSCS does apply, and resource consent may be required for future change of use, subdivision and soil disturbance.

2 Objectives of the Investigation

This report has been prepared in general accordance with the Ministry for the Environment's "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021". This report includes all requirements for a Preliminary Site Investigation report.

The objective of this report is to:

- Collect and assess information from multiple sources to understand previous and current land uses.
- To describe the subject site's physical and environmental features to understand potential pathways and receptors.
- To establish under the NESCS whether it is more likely than not that an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, or has been, undertaken on the site.
- To assess whether there is any risk to potential receptors that would warrant further investigation.

3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Obtaining and review of Environment Canterbury (ECan) GIS data including the Listed Land Use Register (LLUR).
- Search of the Land Information New Zealand (LINZ) orchard database.
- Review of relevant historical aerial photographs.
- Review of relevant historical certificates of title (CTs).
- Review of Christchurch City Council (CCC) property files.
- Site inspection and limited XRF screening.
- Preparation of this report in accordance with MfE guidelines.

4 Site Identification

The subject site is located 4, 22 and 30 Hasketts Road, Templeton, Canterbury as shown on the plan in **Figure 1** below. Details of each property included in the subject site are given in **Table 1** below:

Street Address	Legal Description	Area (ha)
4 Hasketts Road	Lot 6 DP 23834	2.0234
22 Hasketts Road	Lot 2 DP 24156	2.0277
30 Hasketts Road	Lot 1 DP 24156	2.0573
	Total	6.1084

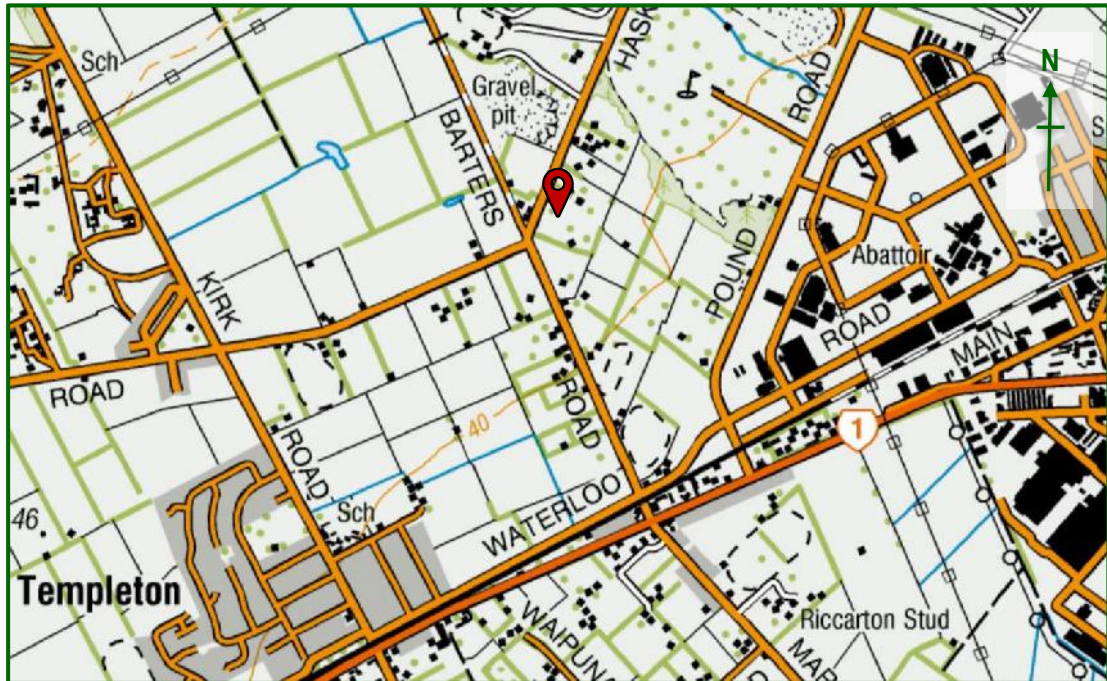


Figure 1 – Location Plan

5 Proposed Site Use

It is proposed to develop the subject site for industrial use. This will involve future change in use, subdivision and potential disturbance of soils.

6 Site Description

6.1 Environmental Setting

Table 2 – Environmental Setting

Topography	The subject site is generally flat land. A gully crosses the eastern end of the subject site.
Geology	The ECan GIS database describes the soils at the subject site as a combination of Waimakariri deep loam, Waimakariri moderately deep loam, Selwyn deep loam over sand, Selwyn moderately deep loam over sand and Rakaia stony loam. Bore log information from wells in the area indicate that topsoils are underlain by layers of sandy gravels, claybound gravels, sandy claybound gravels, and gravel.
Soil Trace Elements	According to the ECan GIS database, natural concentrations of trace elements for the subject site are those of the 'Regional, Recent' soil group.
Groundwater	The subject site lies over the unconfined/semiconfined gravel aquifer system. Groundwater levels recorded on nearby bore logs are between 14.5m and 16.8m deep. The direction of groundwater flow is generally in a south-easterly direction.
Surface Water	A water race runs along part of the southern boundary of 4 Hasketts Road.

6.2 Site Layout & Current Site Uses

The subject site is currently vacant but has most recently been used for rural residential purposes. There is a dwelling on each of the three properties that make up the subject site. Each property also contains multiple sheds / stables.

6.3 Surrounding Land Uses

The surrounding land is mainly a combination of rural and rural residential land. A quarry and clean fill facility is located to the north-west of the subject site.

6.4 Geotechnical Investigations

At the time of writing no geotechnical investigations were made available to Momentum Environmental Ltd (MEL).

7 Historical Site Use Assessment

7.1 Previous Site Ownership and Use

Historical Certificates of Title (CTs) were searched, and the following ownership information was obtained:

28 May 1927	Nathan Clegg, bonemiller
22 July 1927	Andrew Richard Carter, farmer
13 May 1936	John Gerald Carter and Harold Selwyn Carter, farmers
24 October 1951	John Gerald Carter, farmer
21 August 1959	Norman Dean Thomas, farmer
28 June 1960	Leslie Gray Thomas, farmer

4 Hasketts Road

15 July 1965	William Harris, labourer
29 August 1966	David Rivers Cattell, branch manager
03 November 1971	David McLeod, retired runholder and Frances Mary O'Donel McLeod, his wife
09 February 1990	Diana Joan White, married woman
04 May 2004	John William Townsend and Barbara Robyn Townsend
27 November 2009	Christchurch City Council

22 Hasketts Road

13 May 1965	Victor Douglas Clutterbuck, horse trainer
24 November 1965	Rodger Ian Stark, stock agent and Judith Ann Stark, his wife
13 August 1968	David Joseph Fifield, assistant accountant and Julie Dale Fifield, his wife
08 June 1971	Edith May Cresswell, widow
28 October 1994	Arthur David Didham, airline serviceman and Fay Lynette Didham, pharmacy retail manager
11 December 2009	Christchurch City Council

30 Hasketts Road

13 May 1965	Victor Douglas Clutterbuck, horse trainer
18 July 1966	Brian David Willis, plumber
30 September 1970	Brian David Willis and Elizabeth Margaret Willis, his wife
29 August 2006	Elizabeth Margaret Willis
27 November 2009	Christchurch City Council

Note that some of the older information was of poor quality and difficult to follow, therefore the accuracy of the spelling of names and dates is not guaranteed. Copies of the historical CTs are included in **Appendix A**.

7.2 District Council Records

The site is zoned Rural Urban Fringe Zone in the operative Christchurch District Plan.

The property file for the subject site was provided by Christchurch City Council on 23 July 2024. The property file included the following permits/consents for the subject site:

4 Hasketts Road

- Land Information Memorandum (LIM) reports from October 2003 and May 2024 indicate a building permit was issued on 28 August 1967 to erect a dwelling. There are no further details about this permit in the file. No other information relevant to soil contamination was found within the LIMs.
- Building permit issued on 15 January 1990 for dwelling additions.
- Building consent issued on 21 May 2004 to install a solid fuel heater.

22 Hasketts Road

- Building permit issued on 20 April 1970 to erect a dwelling. Plans indicate the roof will be constructed from decramastic tiles. Decramastic tiles of this era sometimes contain asbestos.
- Building permit issued on 21 August 1970 to erect a double garage.
- Building permit issued on 21 October 1971 to erect a storage shed.
- Building consent issued on 12 May 1995 to install a solid fuel heater.

- Resource consent granted on 26 February 1996 to allow a relative unit (family flat) on a site containing an existing rural dwelling.
- Building consent issued on 27 February 1996 to erect a granny flat and detached garage.
- Building consent issued on 26 April 2003 for bathroom alterations.
- Building consent issued on 23 January 2004 for dwelling additions.
- Building consent issued 08 December 2009 to remove the family flat from the property.
- A LIM dated 15 May 2024 contained no information relevant to soil contamination.

30 Hasketts Road

- A LIM dated 15 May 2024 indicates that a building permit was issued to erect a garage on 12 December 1967 and a building permit was issued to erect a dwelling on 23 August 1968. No further details about these permits were found in the property file. No other information relevant to soil contamination was found in the LIM.
- Building permit issued on 15 February 1971 for a dwelling extension.
- Building permit issued on 10 September 1980 to erect a hay shed.
- Building permit issued on 25 October 1983 to erect a farm shed.
- Building permit issued on 18 February 1986 to install a solid fuel heater.

7.3 Regional Council Records

The subject site is not listed on ECan's Listed Land Use Registry (LLUR) for land use activities and industries associated with the Hazardous Activities and Industries List (HAIL).

Two sites located within 100m of the subject site are listed on the LLUR:

- Templeton Country Club is listed for 'A17 – Storage tanks or drums for fuel, chemicals or liquid waste'. As of 1993 two underground fuel storage tanks were present on the site. The site is categorised as 'Verified HAIL has not been investigated'. The listed site is approximately 100m north-east of the subject site. However, the fuel tanks are highly likely to be located near to buildings on the Country Club site, the nearest of which is approximately 440m east of the subject site.
- Site 29261, part of 40 Hasketts Rd is listed for 'A11 – Pest control' from circa 1973 to circa 1984 after a poultry farm and a glasshouse were noted on aerial photographs. The site is categorised as 'Verified HAIL has not been investigated'. The site is adjacent to the northern boundary of the subject site. However, any contamination caused by these activities is likely to be highly localised and unlikely to extend onto the subject site.

See the LLUR Statement in **Appendix B**.

According to the ECan GIS database, there are four active bores on the subject site used for domestic supply, irrigation and stock water supply. There are several similar bores within 100m of the subject site.

According to the ECan GIS database, there are no active resource consents for the subject site. There is an active resource consent for 40 Hasketts Road to discharge domestic wastewater to land. 146 Barbers Road and 35 Hasketts Road, to the north-west of the subject site, has active resource consents related to its use as a quarry and clean fill facility. The resource consents include: to use land for the deposition of material (cleanfill) into excavated land, to discharge leachate from cleanfill deposited into or onto excavated land and to discharge contaminants to air from extraction, handling, processing and conveying of bulk material as a result of deposition of material onto and or into land. There are no other active resource consents for properties within 100m of the subject site.

7.4 LINZ Records

The LINZ Orchard layer does not show the subject site, or any nearby properties as having listed orchards.

7.5 Review of Historical Aerial Photographs

A total of nine aerial photographs have been sourced from the ECan GIS database. Copies of the aerial photographs used are included in **Appendix C**.

- The earliest available aerial photograph is from **1941**. The subject site is pastoral farmland. The surrounding land is mainly similar pastoral farmland. There are two dwellings and some farm sheds beyond the subject site to the west.
- The next available aerial photograph is from **1962**. There are no significant changes to the subject site. Additional farm buildings have been added beyond the subject site to the west. The Templeton Country Club is visible beyond the subject site to the north-east.
- The **1974** aerial photograph shows dwelling have been added to each of the three properties within the subject site. A dwelling and sheds, including two poultry sheds are now present beyond the subject site to the north. A dwelling has also been constructed beyond the subject site, between 4 and 22 Hasketts Road.
- The next available aerial photograph is compiled from images taken in **1982** and **1984**. It shows two sheds have been added to 30 Hasketts Road. The poultry sheds beyond the subject site to the north appear to have been removed. A new smaller shed is now present.
- The **1994** aerial photograph shows no significant changes to the subject site or surrounding area.
- The **2000** aerial photograph shows new sheds and a granny flat have been added to 22 Hasketts Road. Possible horticultural activities are visible beyond the subject site to the west.
- The **2005** aerial photograph shows a possible burn area on the south-east end side of 22 Hasketts Road and a possible burn area on the south-east end side of 30 Hasketts Road. There are no significant changes to the surrounding land.
- The **2012** aerial photograph shows a possible burn area on 4 Hasketts Road. The granny flat on the northern corner of 22 Hasketts Road appears to have been removed. There are no other significant changes to the subject site or surrounding land.
- The latest aerial photograph is dated **2020**. It shows a possible burn area to the north of the farm sheds on 30 Hasketts Road. Another possible burn area is visible to the south-east of the dwelling on 30 Hasketts Road. There are no other significant changes to the subject site or surrounding area.

8 Site Inspection

A site inspection was undertaken on 24 July 2024 to assess the likelihood of soil contamination on the subject site. Site Inspection & Risk Areas Plans detailing the structures present on the subject site and any potential sources of soil contamination observed are included in **Appendix D**. Limited XRF screening of some locations potentially contaminated with heavy metals was also undertaken. The XRF readings are included in **Appendix E**. As the client's proposed use for the subject site is industrial the XRF readings were compared with 'commercial/industrial outdoor worker' soil guideline values (SGVs).

4 Hasketts Road

The structures on 4 Hasketts Road include a dwelling, garage, sheds and a wooden loading ramp. The dwelling is partially brick clad and partially timber clad with a metal roof. To the rear of the dwelling are a timber clad garage and shed. A dilapidated, painted metal garage and a metal and timber stable/shed are present on the eastern end of the subject site. No suspected asbestos containing materials (ACM)

in a deteriorated state were observed on the dwelling or anywhere else on 4 Hasketts Road. There was no evidence of a livestock dip or spray race being present within the loading ramp area.

A possible burn area (labelled on the plan as Burn Area A) was observed on the north-west paddock of the subject site on aerial photographs from 2012 onwards. At the time of the site inspection this area was marked by white tape. No burn pile is currently present and the area is overgrown with weeds. A few charred wood, metal and plastic items were visible within this area indicating that burning of waste items has previously occurred in this location. Four XRF tests of surface soils within this area were performed. One reading showed arsenic elevated above background levels but well below 'commercial/industrial' SGVs. The other readings indicated heavy metals were below background levels. Although burning of waste items is considered 'more likely than not' to have occurred in this area, it is considered unlikely that significant contamination of the soils has occurred that would pose a risk to human health in an industrial use.

A second burn area was observed on the eastern end of the subject site. 'Burn Area B' is an approximate 5m diameter circle of bare, blackened soils with charred waste items including glass and metal. An XRF test within this area confirmed arsenic contamination exceeding the 'commercial/industrial' SGV is present within this area. Lead contamination above background levels but below the 'commercial/industrial' SGV is also present.



Photo 1 – Dwelling (4 Hasketts Rd)



Photo 2 - Garage



Photo 3 – Shed opposite garage



Photo 4 - Dilapidated, painted metal garage



Photo 5 – Stable/shed



Photo 6 – Wooden loading ramp



Photo 7 – Burn Area A



Photo 8 – Burn Area B

22 Hasketts Road

The structures on 22 Hasketts Road include a dwelling with attached garage, stables, triple garage and a hay shed. The dwelling is constructed from concrete block walls with a decramastic tile roof. The decramastic tiles appear slightly worn. If the tiles contain asbestos this could have caused contamination of the surrounding soils. To the south-east of the dwelling is a concrete block stable building with a metal roof, a metal triple garage and a metal and timber hay shed. No likely sources of contamination were observed around these structures.

To the north of the dwelling is an area of scrubby vegetation. This is the former location of the granny flat. Drain covers and a few pieces of embedded concrete indicate the location of the former building. No likely potential sources of contamination were observed.

At the eastern end of the property is a large pile of household waste including appliances, mattresses, scrap metal and timber. None of the surficial items appeared charred and nor were the two trees the waste items were piled around. It was not possible to view or XRF test the underlying soils due to the quantity of waste items in the pile and the growth of grass around it. Potentially no burning has occurred at this location. If no burning has occurred, the risk of significant soil contamination is much reduced.

To the north-east of the household waste pile is a smaller pile which only appeared to include green waste. Burning of materials at this location could not be confirmed/disproved due to the material in the pile and the growth of grass around it. The underlying soils could not be viewed or XRF tested.



Photo 9 – Dwelling with attached garage (22 Hasketts Rd)



Photo 10 - Stables



Photo 11 – Triple garage



Photo 12 - Iron & timber hay shed



Photo 13 – Former granny flat location



Photo 14 – Large waste pile



Photo 15 – Green waste pile

30 Hasketts Road

The structures on 30 Hasketts Road include a dwelling, garage and two farm sheds. The dwelling is constructed from concrete block walls with a decramastic tile roof. The decramastic tiles appear very worn. If the tiles contain asbestos this could have caused contamination of the surrounding soils. The garage is also constructed from concrete block. The garage roof is flat making it difficult to determine the roofing material from the ground, however, it appeared to be metal. The two farm sheds are constructed from corrugated iron and timber. One is divided into stables and the other is divided into looseboxes. No likely sources of contamination were observed around these structures.

The possible burn area observed on the latest aerial to the south-east of the dwelling was seen to be a pile of broken timber. There was no evidence of burning and no evidence of ACM. This is considered unlikely to pose a risk of significant soil contamination.

A waste pile and evidence of ash/charred items was present at the location of the possible burn area observed on aerial photographs to the north of the farm sheds (Burn Area C). XRF testing of the reachable, peripheral soils indicated that arsenic contamination that exceeds the 'commercial/industrial' SGV may be present in this location.

A circular area of greener grass which could indicate another former burn area was observed within one of the paddocks during the site inspection. Closer inspection noted patches of hay and no ash or charred items. Four XRF tests spread across the area detected no elevated heavy metals. Therefore, it is considered most likely that this was a former feed area and burning has not occurred (Feed Area D).

The possible burn area observed on aerial photographs on the eastern end of the subject site was observed to be gorse bushes on a small mound within a gully (Possible Burn Area E). No ash or charred items were visible. Three XRF readings within this area detected no elevated heavy metals. Therefore, it is considered unlikely burning, in particular burning of non-green waste, has occurred in this location.



Photo 16 – Dwelling (30 Hasketts Rd)



Photo 17 – Farm shed used as stables



Photo 18 – Farm shed used as looseboxes



Photo 19 – Pile of broken timber SE of dwelling



Photo 20 – Burn Area C



Photo 21 – Feed Area D



Photo 22 – Gorse bush (Possible Burn Area E)

9 Asbestos Sampling

On 02 August 2024, MEL staff revisited the subject site to undertake asbestos in soil sampling around the dwellings on 22 and 30 Hasketts Road which have decramastic tile roofs. The surface soils were sampled on each side of the two dwellings and submitted for asbestos presence/absence analysis. The sample locations are shown on the Site Inspection & Risk Areas Plans in **Appendix D**.

Field quality assurance measures as described in Section 4.3.1 of the “Contaminated Land Management Guidelines No 5: Site Investigation and Analysis of Soils, revised 2021” (CLMG) were followed. The samples were submitted to Hill Laboratories for analysis. Hill Laboratories holds IANZ accreditation. As part of holding accreditation the laboratory follows appropriate testing and quality control procedures.

No asbestos was detected in any of the eight samples. It is considered highly unlikely that the decramastic roofs have caused asbestos contamination of the soils around these two dwellings. A copy of the laboratory report is included in **Appendix F**.

10 Risk Assessment

10.1 Potential HAIL Uses Identified

The Hazardous Activities and Industries List (HAIL) compiled by The Ministry for the Environment include the following categories (*in italics*) that could be associated with the historical uses of the site with a summary of the risk of these activities having been carried out on the site.

A – Chemical manufacture, application and bulk storage

10. Persistent pesticide bulk storage or use, including sport turfs, market gardens, orchards, glasshouses or spray sheds

The majority of the subject site has been used for pastoral farming activities for its known history. The normal uses of fertilisers and pastoral weed controls associated with pastoral use is unlikely to have caused soil contamination that would pose a risk to human health.

H – Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

The LLUR identified two listed sites near to the subject site. Based on the information included in the LLUR statement is it considered highly unlikely either of these sites would pose a risk of migration of significant quantities of contaminants to the subject site.

A quarry and cleanfill facility is located to the north-west of the subject site. Given the conditions of consent of the quarry/cleanfill, it is considered highly unlikely that this facility poses a risk of migration of significant quantities of contaminants to the subject site.

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.

Buildings were constructed on the subject site from 1967 onwards. Given the era of construction, asbestos containing building materials may have been used in/on these buildings. During the site inspection the only observed suspected asbestos containing materials in a deteriorated state were the decramastic tile roofs on the dwellings at 22 and 30 Hasketts Road. However, soil sampling has shown no asbestos contamination is present around these two dwellings. It is considered highly unlikely that the decramastic roofs have caused asbestos contamination of the soils around these two dwellings.

Burning of materials including non-green waste has or has 'more likely than not' occurred within four burn areas on the subject site. Limited XRF testing indicates two of the four burn areas are contaminated with arsenic above the 'commercial/industrial' SGV of 70mg/kg. Contaminants of concern include heavy metals.

10.2 NESCS Regulation 6(3) Probability Assessment

In terms of the NESCS, Regulation 5(7) states that land is considered to be covered if an activity or industry described in the HAIL is being undertaken; has been undertaken; or is more likely than not to have been undertaken on it. Regulation 6 describes the methods for determining this. Method 6(3) is to rely on a Preliminary Site Investigation. The NESCS Users Guide indicates the test for 'more likely than not' is that there is more than a 50 percent likelihood of the HAIL having occurred. The table below states the likelihood of each HAIL identified:

Table 3 – NESCS Probability Assessment

HAIL Category	6(3)a - Is being undertaken	6(3)b – has been undertaken	6(3)c – likelihood of having been undertaken (if not confirmed)
A10 – Persistent pesticide bulk storage or use	-	-	Highly unlikely
H – Migration of contaminants to the subject site	-	-	Highly unlikely
I – Any other – asbestos from buildings	-	-	Highly unlikely
I – Any other – burn areas	-	Yes	More likely than not

Therefore, the NESCS does apply to the subject site and resource consent may be required for activities controlled by the NESCS.

10.3 Conceptual Site Model

The following conceptual site model for the risk areas identified on the subject site indicates potentially complete exposure pathways.

Table 4 – Conceptual Site Model

Conceptual Site Model				
Source	Pathways		Receptor	Exposure Pathway and Risk Status
<ul style="list-style-type: none"> Heavy metal contamination within existing and possible burn areas. 	Human	Dermal contact, ingestion and inhalation through soil contact	Current and future site occupiers and workers involved in soil disturbance activities	Potentially complete
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.5-16.8m deep at the site	Likely incomplete as heavy metals bind well to soils and the depth to groundwater is large.
		Surface runoff to waterways	Water race along part of southern boundary (not visible during site inspection).	Likely incomplete due to separation distance between the risk areas and the water races.

It is recommended that a Detailed Site Investigation, in terms of the Ministry for the Environments Contaminated Land Management Guidelines, be undertaken on the identified risk areas prior to any development. These areas are shown on the Site Inspection and Risk Area Plans in **Appendix D**.

11 Conclusion

This investigation has identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site and there may be a risk to human health from contaminated soils. The following HAIL activity has been identified:

- Heavy metal contamination within existing and possible former burn areas (HAIL I).

It is recommended that a Detailed Site Investigation, in terms of the Ministry for the Environments Contaminated Land Management Guidelines, be undertaken on the identified risk areas prior to any development.

In terms of planning status, the Preliminary Site Investigation has identified evidence of HAIL activities occurring on the subject site. Therefore, the NESCS does apply, and resource consent may be required for future change of use, subdivision and soil disturbance.

12 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the

site, Momentum Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

No part of this report may be reproduced, distributed, publicly displayed, or made into a derivative work without the permission of Momentum Environmental Ltd, other than the distribution in its entirety for the purposes it is intended.

Appendix A – Historical Certificates of Title

Reference:
Prior C/T. 394/166

Transfer No.
N/C. Order No. 649816



Land and Deeds 69

CANCELLED

REGISTER

4C/379

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 11 acres 1 roods 31 perches or thereabouts, being Lot 3 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas
Clutterbuck of Christchurch Horse
Trainer - 13.5.1965 at 9.38a.m.

W. J. Morrison
A.L.R.

Mortgage 652284 to The New Zealand
Insurance Company Limited - 13.5.1965
at 9.39a.m.

W. J. Morrison
A.L.R.

Mortgage 652285 to *W. J. Morrison*
13.5.1965 at 9.40a.m. *W. J. Morrison*
A.L.R.

DISCHARGED

PLAN No. 24156 DEPOSITED 1.10.1965

N.C.O. 670332 } Cancelled and C's.T.
- 8/12/1965 } 5C/28 and 29 issued
for Lot 1 and the part
Lot 3 D.P. 24156
herein respectively

W. J. Morrison
A.L.R.

CANCELLED : DUPLICATE DESTROYED

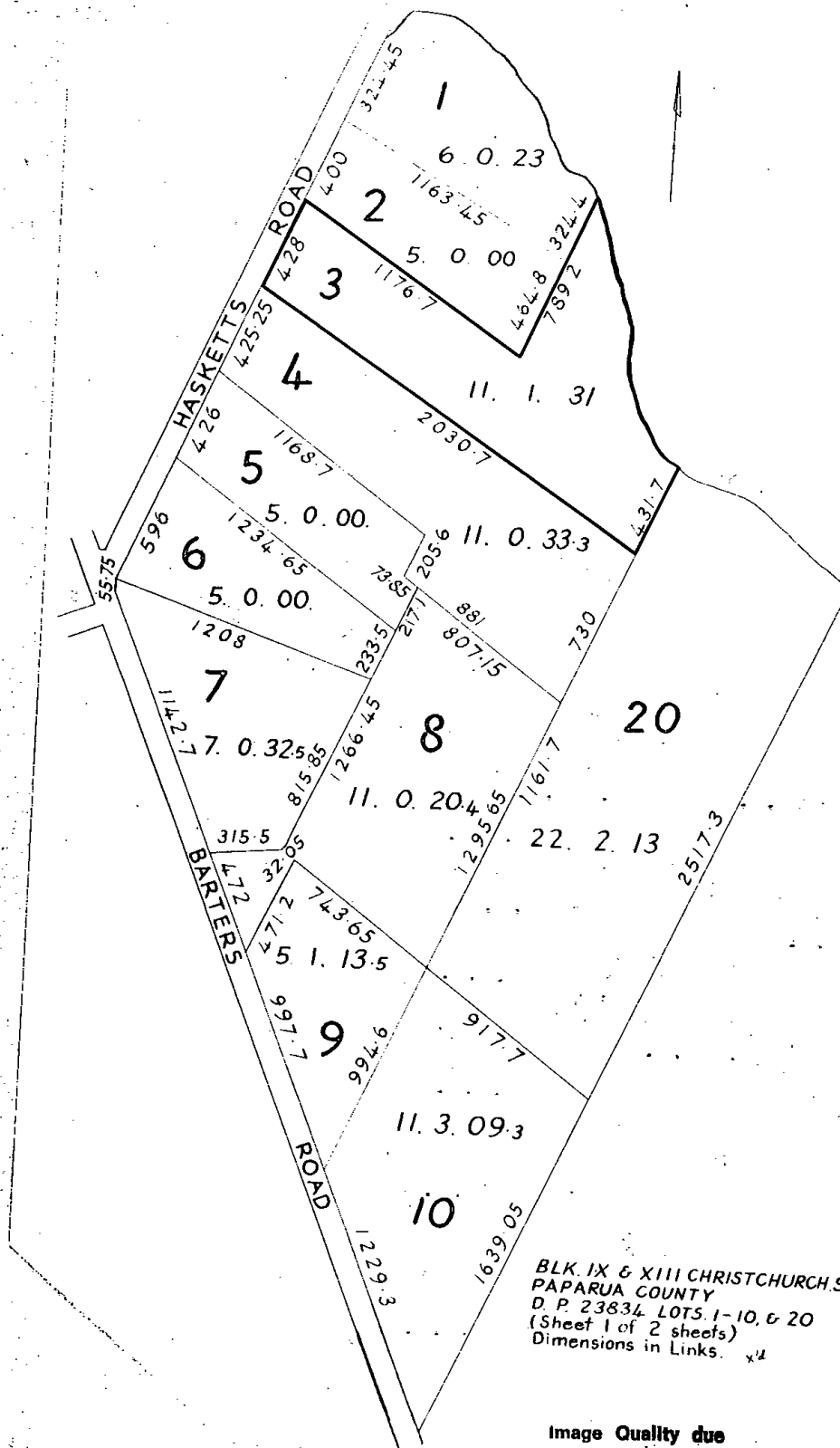
For diagram see back

Scale: 1 inch =

30,00/12/61-48318 W

Register copy for L. & D. 69, 71, 72

No. 4C/379



BLK. IX & XIII CHRISTCHURCH.S.D
 PAPARUA COUNTY
 D. P. 23834. LOTS. 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links. x/4

Image Quality due
 to Condition
 of Original



Reference:
Prior C/T. 394/166

Transfer No.
N/C. Order No. 649816



Land and Deeds 69

REGISTER

PART CANCELLED

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 11 acres 0 roods 33.3 perches or thereabouts being Lot 4 on Deposited Plan 24156 part of Rural Section 2810



District Land Registrar

Transfer 652283 to Victor Douglas
Clutterbuck of Christchurch Horse
Trainer - 13.5.1965 at 9.38a.m.

N.C.O. 670332 } Cancelled and C.T.
- 8/12/1965 } 50/29 issued for
the part Lot 3 D.P.
24156 herein

[Signature]
A.L.R.

[Signature]
A.L.R.

Mortgage 652284 to The New Zealand
Insurance Company Limited - 13.5.1965
at 9.39a.m.

CANCELLED : DUPLICATE DESTROYED

[Signature]
A.L.R.

Mortgage 652285 to Barbara Foley
13.5.1965 at 9.40a.m.

DISCHARGED
[Signature]
A.L.R.

PLAN No. 24156 DEPOSITED 1.10.1965

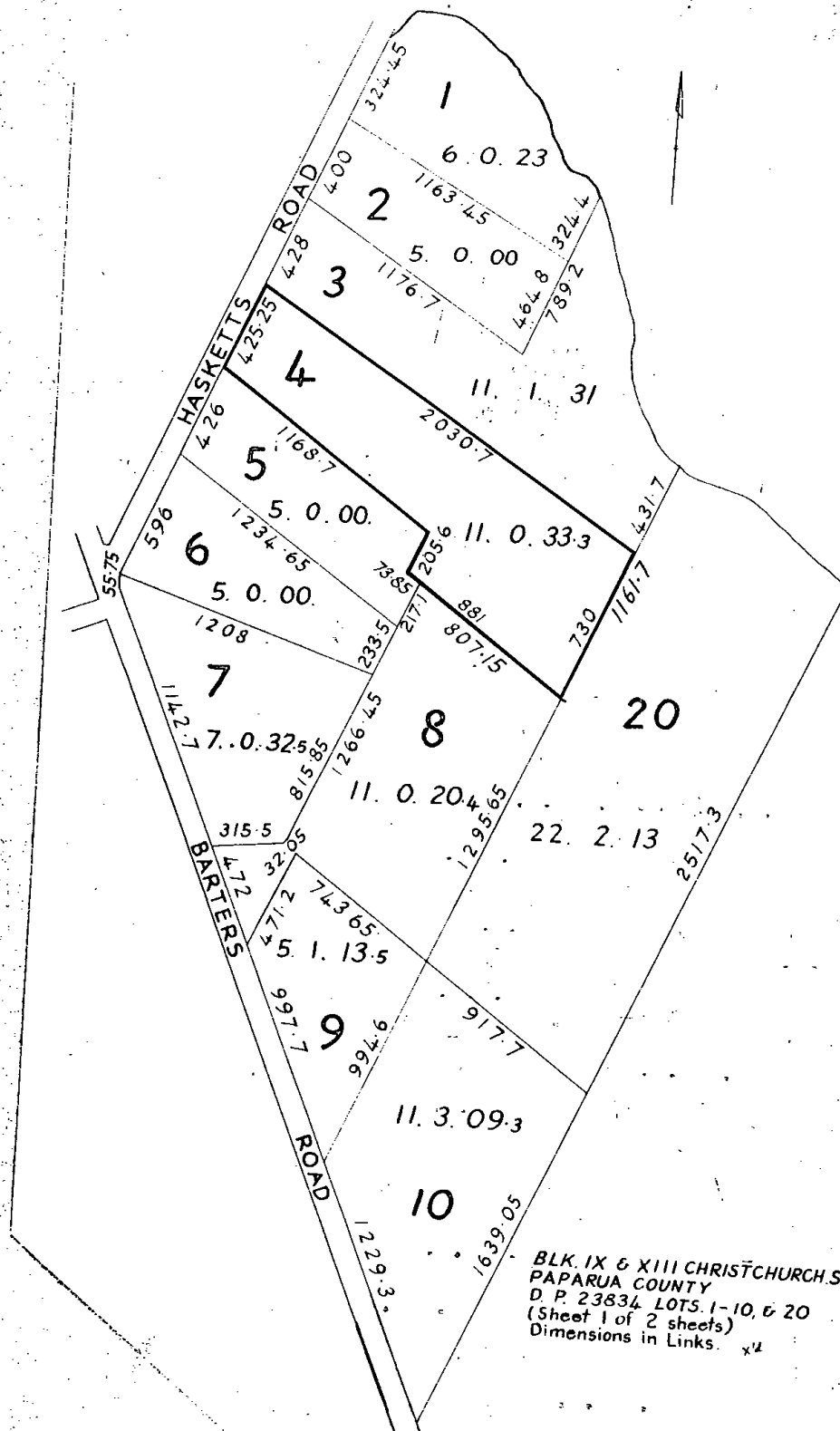
Discharge of Mortgage 652284 as to Lot
2 D.P. 24156 - 24/11/1965 at 9.25a.m.

[Signature]
A.L.R.

Transfer 669002 of Lot 2 D.P. 24156 to
Rodger Ian Stark and Judith Ann Stark
- 24/11/1965 at 9.27a.m.
5B/4280

[Signature]
A.L.R.

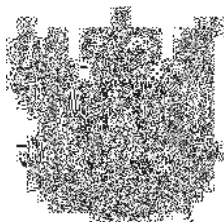
PART CANCELLED
For diagram see back
Scale: 1 inch =



BLK. IX & XIII CHRISTCHURCH S.D
 PAPARUA COUNTY
 D. P. 23834 LOTS. 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links. x2

Image Quality due
 to Condition
 of Original





RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB4C/382**
Land Registration District **Canterbury**
Date Issued 08 April 1965

Prior References
CB394/166

Estate Fee Simple
Area 2.0234 hectares more or less
Legal Description Lot 6 Deposited Plan 23834

Original Registered Owners
Diana Joan White

Interests

5989967.1 Transfer to John William Townsend and Barbara Robyn Townsend - 4.5.2004 at 9:00 am

8298522.1 Transfer to Christchurch City Council - 27.11.2009 at 1:52 pm

Land Covenant (in gross) in favour of Christchurch City Council created by Covenant Instrument 12943298.1 - 22.2.2024 at 2:47 pm

Reference:

Prior C/T. 394/166

Land and Deeds 69

Transfer No.

N/C. Order No. 649816



REGISTER

4C/382

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 5 acres - roods

- perches or thereabouts being Lot 6 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 657975 to William Harris of Christchurch Labourer - 15.7.1965 at 11.56a.m.

A.L.R.

Variation of Mortgage 847676 19.10.1977 at 11.47 a.m.

A.L.R.

Transfer 691019 to David Rivers Cattell of Christchurch Branch Manager - 29/8/1966 at 9.52a.m.

A.L.R.

Variation of Mortgage 847676 - 1.10.1979 at 9.45 a.m.

for A.L.R.

Mortgage 736253 to Ian West Taylor and William George Phillips Cunningham and to Ina Francis Warner in shares - 6/5/1968 at 2.35 p.m.

A.L.R.

Transfer 855069/1 to Diana Joan White of Christchurch, Married Woman - 9.2.1990 at 10.30am

for A.L.R.

Transfer 847675 to David McLeod of Templeton, Retired Runholder - 3.11.1971 at 11.35 a.m.

A.L.R.

Mortgage 847676 to the Clergy Pension Trust Board - 11.35 a.m.

A.L.R.

Settled under the Joint Family Homes Act 1964 on David McLeod abovenamed and Frances Mary O'Donel McLeod his wife - 3.11.1971 at 11.35 a.m.

Application 32445 for diagram see back

A.L.R.

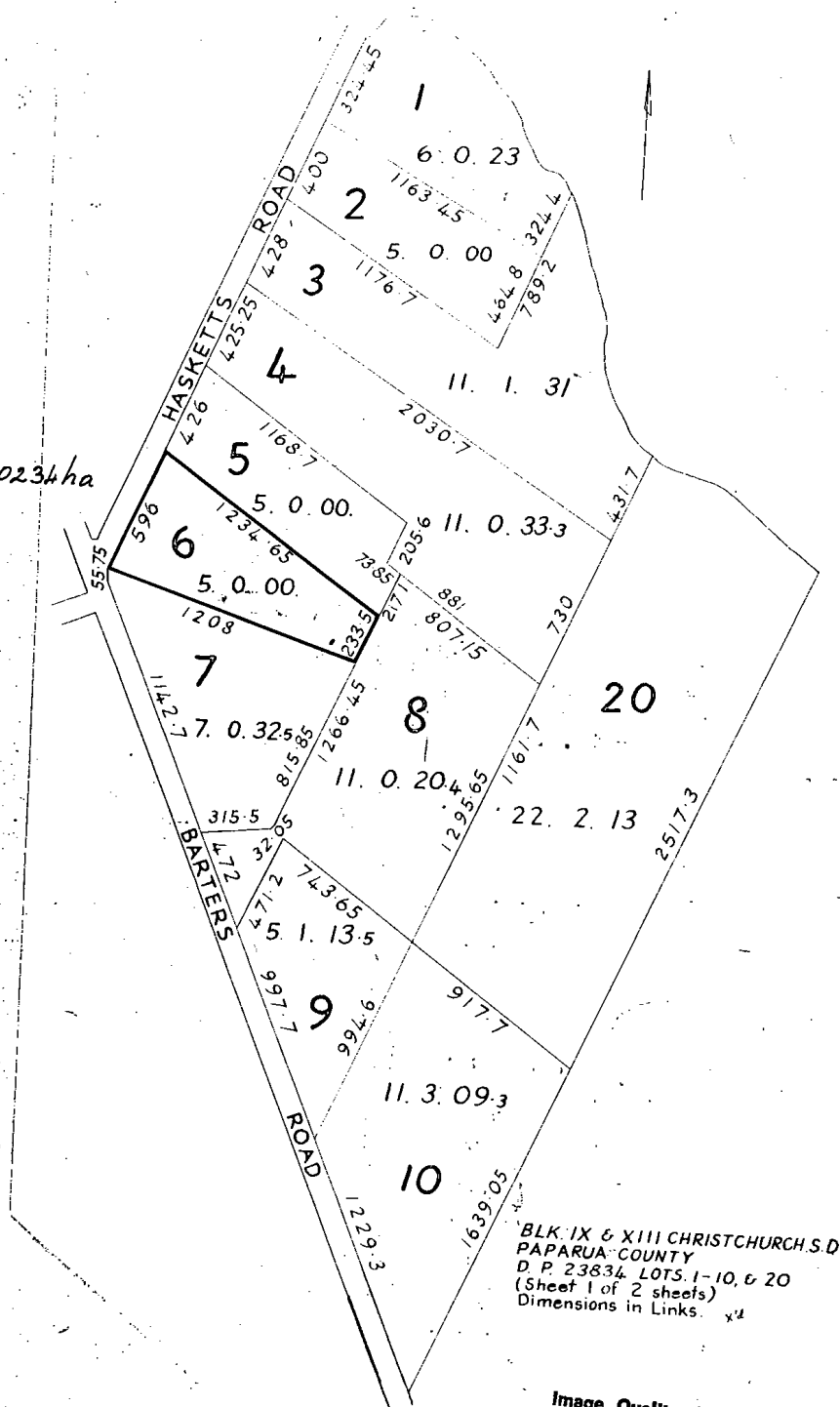
Scale: 1 inch =

No. 4C/382

30,00/12/61-48318 W

Register copy for L. & D. 69, 71, 72

METRIC AREA: 2.0234 ha



Reference:
Prior C/T. 4C/380
Transfer No. 669002
N/C. Order No.



CANCELLED

CANCELLED

Land and Deeds 69

REGISTER

No. 5B/1280

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 24th day of November one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that RODGER IAN STARK of Edendale Stock Agent and JUDITH ANN STARK his wife are

seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 5 acres 1.7 perches or thereabouts situated in Block IX Christchurch Survey District being Lot 2 on Deposited Plan No. 24156 part Rural Section 2810



Assistant Land Registrar

Mortgage 669003 to John Robert Price and Edna Jean Price - 11/11/1965 at 9.28a.m.

Mortgage 670331 to Victor Douglas Clutterbuck - 11/11/1966 at 11.9 a.m.

Transfer 743725 to David Joseph of Fifield of Christchurch, Assistant Accountant and Julie Dale Fifield his wife - 13/8/1968 at 9.20 a.m.

Mortgage 803442 to The State Advances Corporation - 24/7/1970 at 9.25 a.m.

Mortgage 803443 to Alma Winifred West - 24/7/1970 at 9.25 a.m.

Transfer 833191 to Edith May Cresswell of Christchurch, Widow - 8/6/1971 at 11.32 a.m.

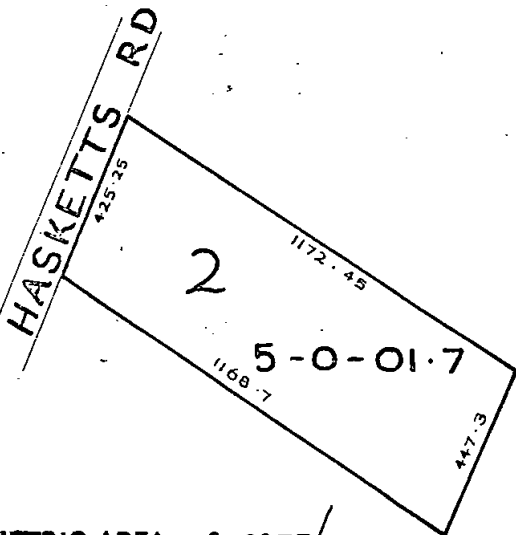
CAVEAT A131388/1 BY ARTHUR DAVID DIDHAM AND FAY LYNETTE DIDHAM - 30.8.1994 AT 9.45AM

for A.L.R.

No. A133146/1 the outstanding duplicate hereof having been declared lost this certificate of title is hereby cancelled and a new certificate of title 39D/83 issued herefor - produced 7.9.1994 and entered 29.9.1994 at 9.00am

CANCELLED

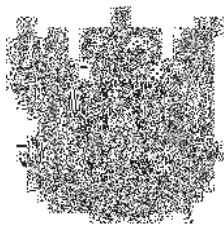
DUPLICATE DESTROYED 4/11/1995



METRIC AREA: 2.0277ha

Scale: 1 inch = 4 chains

No. 5B/1280



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB5C/28**
Land Registration District **Canterbury**
Date Issued 08 December 1965

Prior References
CB4C/379

Estate Fee Simple
Area 2.0573 hectares more or less
Legal Description Lot 1 Deposited Plan 24156

Original Registered Owners
Brian David Willis and Elizabeth Margaret Willis

Interests

29944 Settled under the Joint Family Homes Act 1964 - 30.9.1970 at 11.22 am
229224.1 Mortgage to D.F.C. New Zealand Limited - 6.6.1979 at 9.51 am
6661792.1 Discharge of Mortgage 229224.1 - 24.11.2005 at 9:00 am
7007014.1 Transmission to Elizabeth Margaret Willis as survivor - 29.8.2006 at 9:00 am
8325377.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981 - 27.10.2009 at 9:00 am
8349986.1 Transfer to Christchurch City Council - 27.11.2009 at 1:53 pm
8349986.1 Cancellation of Joint Family Home Settlement
8349986.2 Discharge of Compensation Certificate 8325377.1 - 27.11.2009 at 1:53 pm
Land Covenant (in gross) in favour of Christchurch City Council created by Covenant Instrument 12943298.1 - 22.2.2024 at 2:47 pm

Reference:
Prior C/T. 40/379
Transfer No.
N/C. Order No. 670332



Land and Deeds 69

REGISTER

No. 5C/28

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of December one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that VICTOR DOUGLAS CLUTTERBUCK of Christchurch Horse Trainer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 5 acres 13.4 perches or thereabouts situated in Block IX Christchurch Survey District being Lot 1 on Deposited Plan No. 24156 part Rural Section

Image Quality due
to Condition
of Original



Assistant Land Registrar

Mortgage 652284 to The New Zealand
Insurance Company Limited - 17.5.1965
at 9.39a.m.

A.L.R.

Mortgage 810033 to Henry Ellmers
- 30/9/1970 at 12.22.14.20

A.L.R.

Transfer 687320 to Brian David Willis
of Christchurch Plumber- 18.7.1966
at 12.4 p.m.

A.L.R.

Settled under the Joint Family Homes
Act 1964 on Brian David Willis
abovenamed and Elizabeth Margaret Willis
his wife - 30/9/1970 at 11.22 a.m.
Application 29944

A.L.R.

Transmission 849953 of Mortgage 810033
to Pyne Gould Guinness Limited -
24/11/1971 at 11.40 a.m.

Mortgage 64101/2 to Harry Pascoe
Nominees Limited - 2.11.1968 at
10.57 a.m.

A.L.R.

Mortgage 229224/1 to The Prudential Building
and Investment Society of Canterbury - 6.6.1979
at 9.51 am.

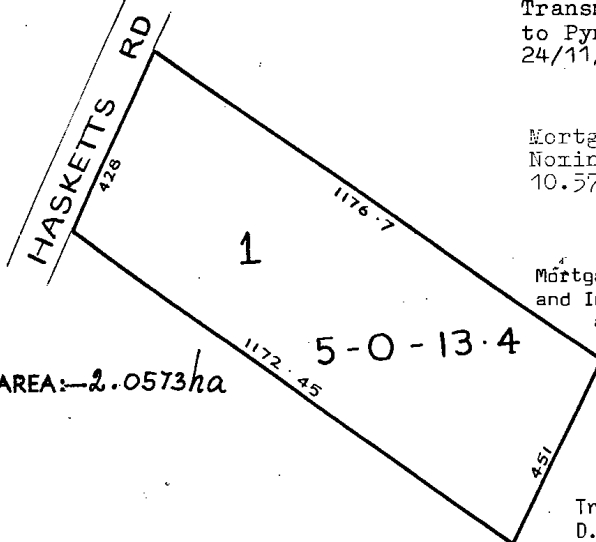
for A.L.R.

Transfer 963235/1 of Mortgage 229224/1
to Brookstock No.17 Limited (in
Receivership) - 4.11.1991 at 2.23pm

A.L.R.

Transfer 984565/1 of Mortgage 229224/1 to
D.F.C. New Zealand Limited - 24.3.1992 at
11.22am

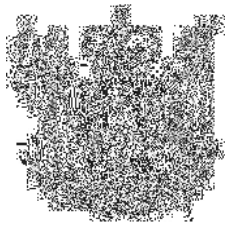
15,000/3/63 A.L.R.



METRIC AREA:-2.0573ha

Scale: 1 inch = 3 chains

No. 5C/28



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB39D/83**
Land Registration District **Canterbury**
Date Issued 29 September 1994

Prior References
CB5B/1280

Estate Fee Simple
Area 2.0277 hectares more or less
Legal Description Lot 2 Deposited Plan 24156
Original Registered Owners
Arthur David Didham and Fay Lynette Didham

Interests

A141911.3 Mortgage to Post Office Bank Limited - 28.10.1994 at 2.53 pm
A297147.1 CAVEAT BY CHRISTCHURCH CITY COUNCIL - 14.5.1997 AT 10.45 AM
8364845.1 Withdrawal of Caveat A297147.1 - 11.12.2009 at 12:10 pm
8364845.2 Discharge of Mortgage A141911.3 - 11.12.2009 at 12:10 pm
8364845.3 Transfer to Christchurch City Council - 11.12.2009 at 12:10 pm
Land Covenant (in gross) in favour of Christchurch City Council created by Covenant Instrument 12943298.1 - 22.2.2024 at 2:47 pm

References

Prior C/T 5B/1280

Land and Deeds 69

Transfer No.

N/C. Order No. D/L A133146/1 - 7.9.1994



REGISTRE

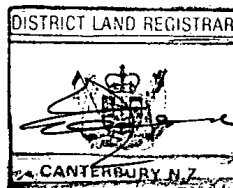
No. 39D/83

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 29th day of September one thousand nine hundred and ninety four under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that EDITH MAY CRESSWELL of Christchurch, Widow ---

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 2.0277 hectares or thereabouts being Lot 2 Deposited Plan No. 24156 ---



ASSISTANT LAND REGISTRAR

Subject to:

CAVEAT A131388/1 BY ARTHUR DAVID DIDHAM AND
FAY LYNETTE DIDHAM - 30.2.1994 at 9.45am

Transfer A141911/2 to Arthur David Didham,
Airline Serviceman and Fay Lynette Didham,
Pharmacy Retail Manager, both of
Christchurch - 28.10.1994 at 2.53pm

Christchurch City

A.L.R.

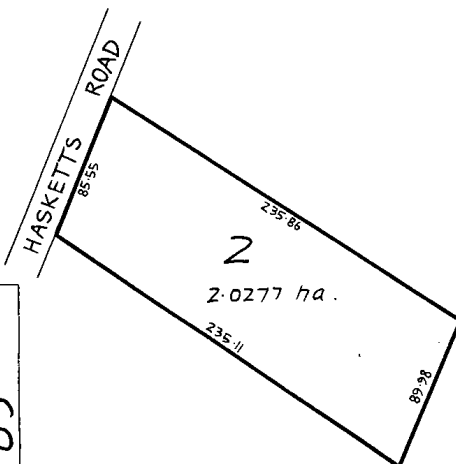
Mortgage A141911/3 to Post Office Bank
Limited - 28.10.1994 at 2.53pm

for A.L.R.

for A.L.R.

CAVEAT A297147/1 BY CHRISTCHURCH CITY
COUNCIL - 14.5.1997 at 10.45am

for A.L.R.



Measurements are Metric

No. 39D/83

are
on
no.

CERTIFICATE OF TITLE No. /



394/165

NEW ZEALAND.

Land Transfer (Compulsory Registration of Titles) Act, 1921.
Deeds Index C. 2810
Application No. C. 4608



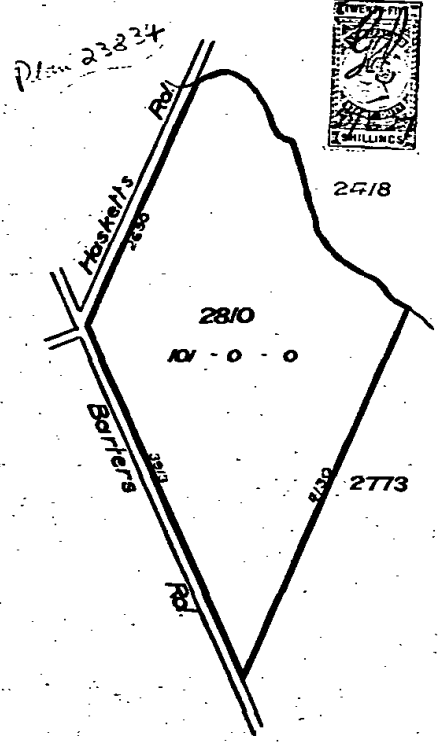
James Wed.
Register-book
Vol. 354, folio 166

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.
LIMITED AS TO PARCELS AND TITLE.

This Certificate, dated the Twenty-eighth day of May one thousand nine hundred and Twenty-seven
under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury Witnesseth that
NATHAN CLEGG of Hornby Bone-miller

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, that is to say: All that parcel of land containing ONE HUNDRED AND ONE ACRES or thereabouts situated in Block XIII of the Christchurch Survey District being Rural Section 2810 and being more particularly described in Conveyance Registered No. 115457 (185/24)

Image Quality due to Condition of Original



394/166

Transmission 27513 to John Gerald Carter and Harold Clayton Carter both of 21 Templeton Farmers, dated 12 May 1951 at 2:52 pm.

John Carter
D.R.

349279 Transfer: John Gerald Carter and Harold Clayton Carter to the said John Gerald Carter produced 24 October 1951 at 11:20 am.

John Carter
D.R.

349280 Mortgage: John Gerald Carter and Harold Clayton Carter produced 21/8/1951 at 11:6 am.

DISCHARGE

John Carter
D.R.

Transfer 507111 John Gerald Carter to Norman Dean Thomas of Christchurch Farmers produced 21/8/1959 at 12:6 pm.

Norman Thomas
D.R.

Discharge in error to John Gerald Carter produced 21/8/1959 at 12:6 pm.
Norman Thomas
D.R.

Transfer 527553 Norman Dean Thomas to Leslie Gray Thomas of Christchurch Farmers produced 20/6/1960 at 2:36 pm.

Norman Thomas
D.R.

Mortgage 527556 Leslie Gray Thomas of Norman Dean Thomas produced 20/6/1960 at 2:37 pm.

Norman Thomas
D.R.

Transfer of the terms of mortgage 527556 to Leslie Gray Thomas produced 20/6/1960 at 10:30 am.

Norman Thomas
D.R.

⑤ Mortgage 507112 John Gerald Carter - 21/8/1959 at 12:6 pm.

John Carter
D.R.

Pursuant to Section 35(3) of the Land Registration Act 1961 Part 21 DP 23834 vested in Her Majesty the Queen under - 2/4/1965.

Norman Thomas
D.R.

N.C. 647816 cancelled and new C.S. 2/4/1965 41/377 to 386 and 396 issued for Part 1 to 10 of 20 DP 23834.

Norman Thomas
D.R.

James R. H. Duplicate destroyed

PLAN No. 23834 DEPOSITED 2-4-1965

Appendix B – LLUR Statement

Property Statement from the Listed Land Use Register



Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ384458

Date generated: 15 July 2024
Land parcels: Lot 1 DP 24156
Lot 2 DP 24156
Lot 6 DP 23834



The information presented in this map is specific to the area within a 100m radius of property you have selected. Information on properties outside the search radius may not be shown on this map, even if the property is visible.

Sites at a glance

 Sites within enquiry area

Site number	Name	Location	HAIL activity(s)	Category
-------------	------	----------	------------------	----------

Please note that the above table represents a summary of sites and HAILS intersecting the area of enquiry only.

 Nearby sites

Site number	Name	Location	HAIL activity(s)	Category
1425	Templeton Country Club	Pound Road, Templeton, Christchurch	A17 - Storage tanks or drums for fuel, chemicals or liquid waste;	Not Investigated
29261	29261	Paparua	A11 - Pest control;	Not Investigated

Please note that the above table represents a summary of sites and HAILS intersecting the area of enquiry within a 100m buffer.

More detail about the sites

Site 1425: Templeton Country Club (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: Pound Road, Templeton, Christchurch
Legal description(s): RES 2418; RES 5094; RS 38609; Lot 1 DP 34947

HAIL activity(s):	Period from	Period to	HAIL activity
	?	1993	Storage tanks or drums for fuel, chemicals or liquid waste

Notes:

5 Jul 1999 1993: Two underground storage tanks on site, one 2350 L UST 3(a) product, and one 2300 L UST 3(c) product.
Land use = ?-1999: Golf Course

16 Nov 2017 Area defined from: 1965-2011 ECan Aerial Photographs Note: A sport turf golf course was noted on aerial photographs reviewed. 16/10/2013



Investigations:

There are no investigations associated with this site.

Site 29261: 29261 (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: Paparua
Legal description(s): Lot 2 DP 23834

HAIL activity(s):	Period from	Period to	HAIL activity
	Pre 1973	Pre 1984	Pest control including the premises of commercial pest control operators or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application

Notes:

16 Oct 2013 Area defined from: 1973-1984 ECan Aerial Photographs.
Note: A poultry farm was noted in early aerial photographs an a glass house was noted in later photographs reviewed.



Investigations:

There are no investigations associated with this site.



Nearby investigations of interest

There are no investigations associated with the area of enquiry.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or

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Appendix C – Historical Aerial Photographs

1941 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 18/07/2024 at 5:09 PM



1962 Aerial

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Scale: 1:3,000 @A4

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1974 Aerial

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1982/1984 Aerial

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1994 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 18/07/2024 at 5:15 PM



2000 Aerial

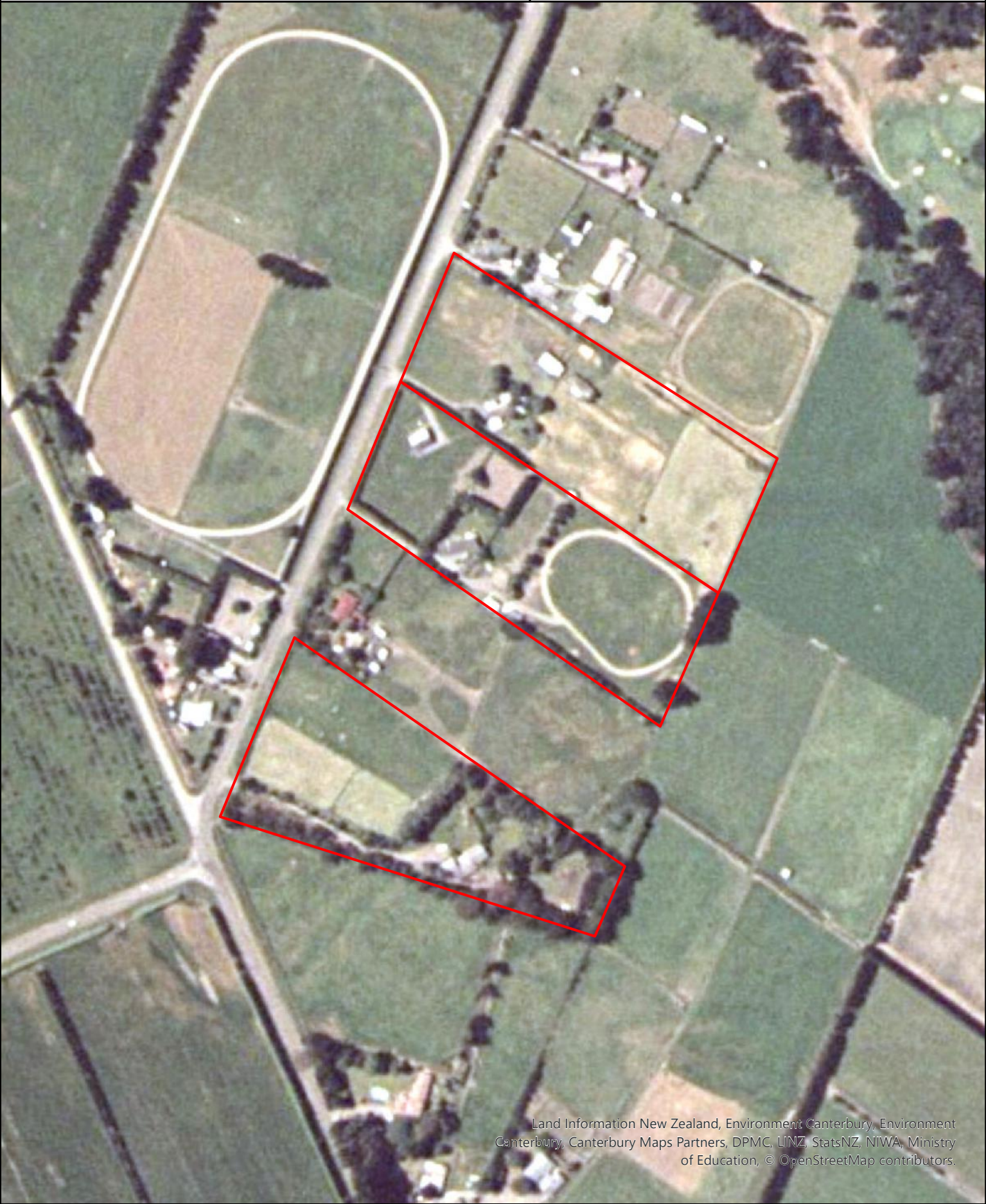
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2005 Aerial

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Scale: 1:3,000 @A4

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2012 Aerial

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2020 Aerial

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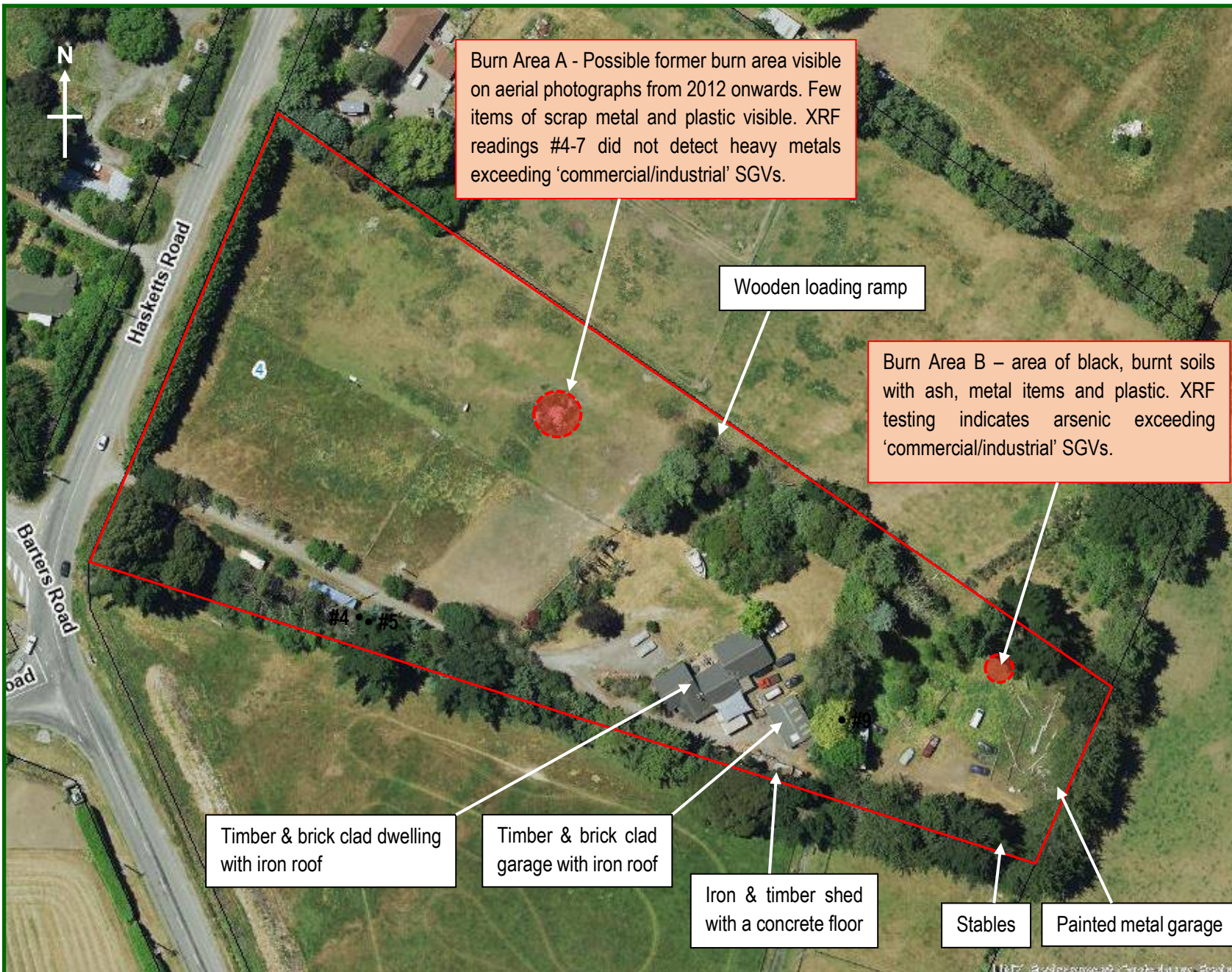


Scale: 1:3,000 @A4

Map Created by MEL on 18/07/2024 at 5:18 PM



Appendix D – Site Inspection & Risk Areas Plan



LEGEND

text	Potential HAIL activity / source of contamination
	Approx. extent of risk area
text	Description of structures/areas

Graphic scale is approximate only



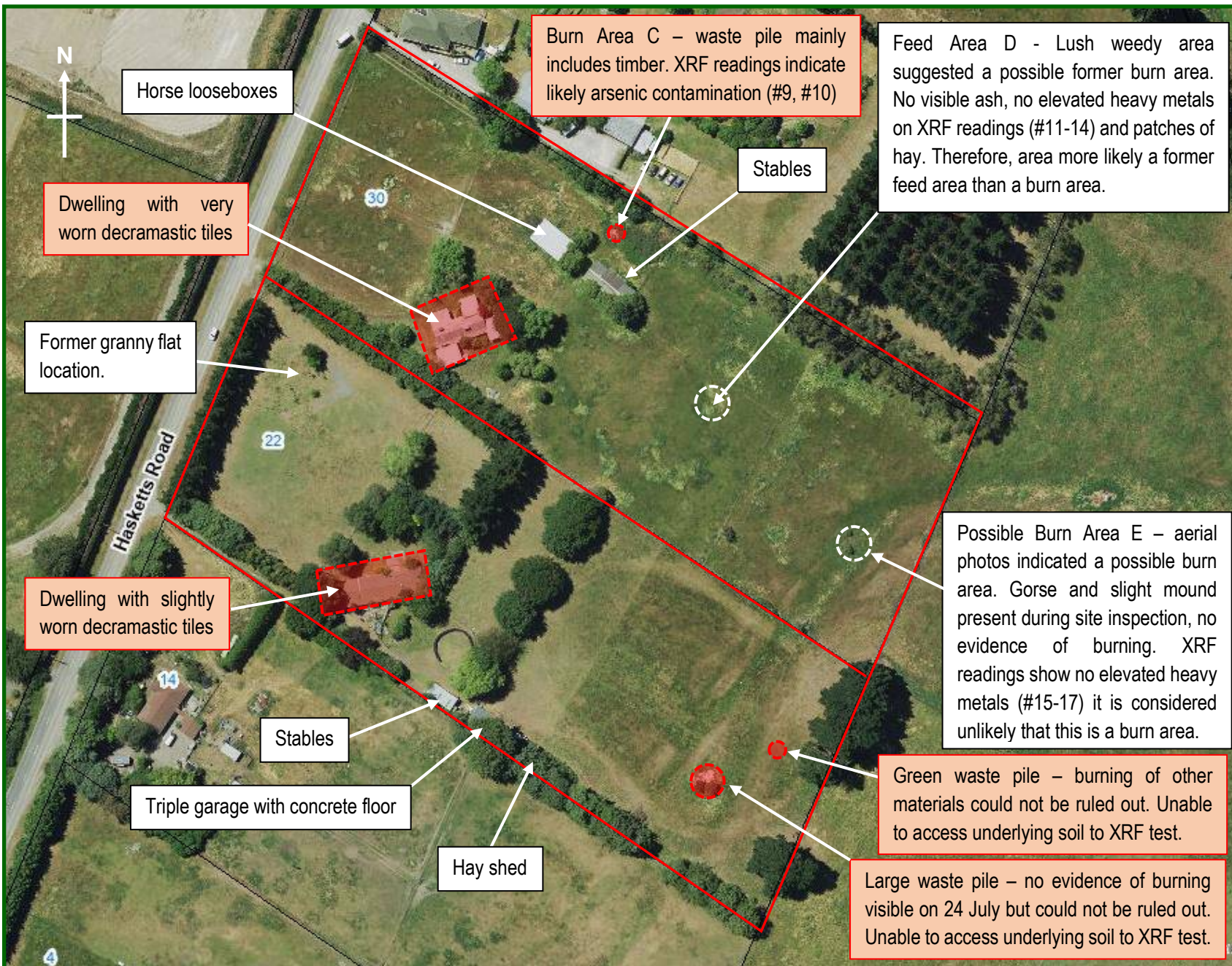
Date: 24 July 2024

Drawing No: 874/1

4 Hasketts Road, Templeton Site Inspection and Risk Area Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



LEGEND

- text Potential HAIL activity / source of contamination
- Approx. extent of risk area
- text Description of structures/areas

Graphic scale is approximate only



Date: 24 July 2024

Drawing No: 874/2

22 & 30 Hasketts Road, Templeton Site Inspection and Risk Area Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Appendix E – Table of XRF Results

Table of XRF Results - 4, 22 & 30 Hasketts Road, Templeton

Date of testing: 24 July 2024

Units: ppm



Sample ID (Lab tested in bold)	Sample Depth (mm)	XRF Reading No	Date	Time	Test Duration (secs)	Total Recoverable Arsenic		Total Recoverable Lead	
						Result	Error	Result	Error
Calibration Test	-	1	24/07/2024	9:04:38	40.0	441	4	483	4
Calibration Test	-	2	24/07/2024	9:05:37	40.0	12	1	15	1
Blank	-	3	24/07/2024	9:06:59	40.0	<LOD	3	<LOD	5
4 Hasketts - Burn area A	0	4	24/07/2024	9:57:17	30.7	18	1	10	1
4 Hasketts - Burn area A	0	5	24/07/2024	9:58:18	30.0	4	1	14	1
4 Hasketts - Burn area A	0	6	24/07/2024	9:59:08	30.0	8	1	12	1
4 Hasketts - Burn area A	0	7	24/07/2024	10:00:05	30.7	6	1	11	1
4 Hasketts - Burn area B	0	8	24/07/2024	10:03:37	21.2	162	5	1075	6
30 Hasketts - Burn area C	0	9	24/07/2024	10:54:24	30.0	7	1	26	1
30 Hasketts - Burn area C	0	10	24/07/2024	10:55:21	31.7	49	2	328	3
30 Hasketts - Feed area D	0	11	24/07/2024	10:57:20	30.0	<LOD	2	<LOD	3
30 Hasketts - Feed area D	0	12	24/07/2024	10:58:13	30.0	2	1	7	1
30 Hasketts - Feed area D	0	13	24/07/2024	10:59:01	31.1	2	1	8	1
30 Hasketts - Feed area D	0	14	24/07/2024	10:59:54	30.0	5	1	10	1
30 Hasketts - Possible burn area E	0	15	24/07/2024	11:02:34	30.0	3	1	12	1
30 Hasketts - Possible burn area E	0	16	24/07/2024	11:03:33	30.0	4	1	13	1
30 Hasketts - Possible burn area E	0	17	24/07/2024	11:04:33	31.1	4	1	13	1
Blank	0	18	24/07/2024	11:10:52	40.0	<LOD	3	<LOD	4
Soil Guideline Values	Commercial/Industrial Outdoor Worker					70		3,300	
	Reference					NES		NES	

Result exceeds 'commercial/industrial' SGV

Result likely exceeds 'commercial/industrial' SGV based on previous experience

Appendix F – Lab Report

Certificate of Analysis

Page 1 of 2

Client:	Momentum Environmental Limited	Lab No:	3641276	A2Pv1
Contact:	Fran Hobkirk	Date Received:	02-Aug-2024	
	C/- Momentum Environmental Limited	Date Reported:	06-Aug-2024	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	884-22+30 Hasketts Road	
		Submitted By:	Fran Hobkirk	

Sample Type: Soil						
Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
ASB1	3641276.1	79.9	39.7	34.4	Asbestos NOT detected.	-
ASB2	3641276.2	120.6	70.9	48.3	Asbestos NOT detected.	-
ASB3	3641276.3	193.1	168.3	29.2	Asbestos NOT detected.	-
ASB4	3641276.4	130.4	94.6	50.8	Asbestos NOT detected.	-
ASB5	3641276.5	141.4	99.0	51.0	Asbestos NOT detected.	-
ASB6	3641276.6	137.1	87.7	50.3	Asbestos NOT detected.	-
ASB7	3641276.7	150.5	111.2	57.8	Asbestos NOT detected.	-
ASB8	3641276.8	132.8	93.4	50.0	Asbestos NOT detected.	-

Glossary of Terms

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

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-8
Dry Weight Presence / Absence Testing	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	1-8
<2mm Subsample Weight Presence / Absence Testing	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-8

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Asbestos Presence / Absence from Presence / Absence Testing	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%	1-8
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present.	-	1-8
Asbestos in Soil Presence / Absence Testing ESdat Electronic Transfer			
Amosite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-8
Chrysotile Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-8
Crocidolite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-8

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

Testing was completed on 06-Aug-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



Soil Contamination Investigations

Pound Road Industrial Development, Christchurch

May 2025



www.momentumenviro.co.nz

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Quality Control and Certification Sheet

Client: NTP Development Holdings Ltd

Date of Issue: 28 May 2025

Report co-written by:

Julia Hopkins, Graduate Environmental Scientist

Signed: [REDACTED]

Email: [REDACTED]

Report co-written by:

Fran Hobkirk, Senior Environmental Scientist, BSc.
(8 years contaminated land experience)

Signed: [REDACTED]

Email: [REDACTED]

Phone: [REDACTED]

Report reviewed and certified as a Suitably Qualified and Experienced Practitioner by:

Nicola Peacock, Principal Environmental Engineer, NZCE, CEnvP
(16 years contaminated land experience within 32 years environmental experience)

Signed: [REDACTED]

[REDACTED]
[REDACTED]



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1 Executive Summary

The subject of this investigation is located across several rural and rural residential properties located between Pound Road, Waterloo Road, Barters Road and Hasketts Road on the outskirts of Christchurch. The client is proposing to subdivide the site for industrial use. This will involve subdivision, change of use of the land and likely soil disturbance activities and off-site disposal of soils. As a result, an assessment under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NESCS) is required. It is also noted that Momentum Environmental Ltd (MEL) is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016.

This and previous Preliminary Site Investigations identified potential sources of contamination on the site associated with confirmed or likely Hazardous Activities and Industries List (HAIL) activities, including:

- Potential heavy metal and organonitrogen and organophosphorus pesticide (ONOP) contamination within the farmyard and across the paddocks on 173 Pound Road from possible persistent pesticide bulk storage and use since approximately 1990 (HAIL A10).
- Potential heavy metal and organochlorine pesticide (OCP) contamination from possible horticultural activities occurring at 48 Hasketts Rd in the 1970s (HAIL A10).
- Potential heavy metal and ONOP contamination from horticultural activities occurring at 40 Hasketts Rd from 2000 onwards (HAIL A10).
- Potential heavy metal and OCP contamination from pest control within poultry sheds on 40 Hasketts Rd in the 1970s (HAIL A11).
- Potential Total Petroleum Hydrocarbon (TPH) contamination from diesel above ground storage tanks (ASTs) on 173 Pound Rd (HAIL A17).
- Possible heavy metal contamination within a burn pile and stockpile on 173 Pound Rd (HAIL G5).
- Possible heavy metal contamination within a pit and nearby stockpiles including one with visible ashy soils and burnt items on 2 Barters Rd (HAIL G5).
- Possible heavy metal contamination from the use of lead-based paints on pre-1941 buildings on 2 Barters Rd and 570 Waterloo Road (HAIL I).
- Possible asbestos contamination from 1970s era buildings on 40 Hasketts Rd (HAIL I).
- Possible heavy metal contamination within burn areas on 173 Pound Rd, 578 Waterloo Rd, 38 Barters Rd, 86 Barters Road, 94 Barters Rd, 4 Hasketts Rd, 22 Hasketts Rd, and 30 Hasketts Rd (HAIL I).
- Possible heavy metal and PAH contamination on a former horse training track across 40 and 48 Hasketts Rd (HAIL I).

Soil sampling undertaken on the identified risk areas during this and previous investigations have confirmed several areas of contamination above the relevant human health standard are present on the site:

- Laboratory results show five burn areas located on 578 Waterloo Road, 94 Barters Road, 4 Hasketts Road, 22 Hasketts Road and 30 Hasketts Road are contaminated with arsenic above the 'commercial/industrial' soil guideline value (SGV).
- Dumped material on 22 Hasketts Road is contaminated with arsenic above 'commercial/industrial' SGVs.
- XRF testing of a further three burn areas located on 173 Pound Road, 86 Barters Road and 4 Hasketts Road and some ashy soils on a stockpile on 2 Barters Road indicates that

some exceedances of the arsenic 'commercial/industrial' SGV are likely present despite the laboratory results being below the SGV.

- TPH (C10-C14 fraction) exceeds the 'commercial/industrial' SGV in soils under an AST on 173 Pound Road. TPH concentrations were below the 'commercial/industrial' SGV under a second AST. TPH exceeds Ecological Guideline Values in soils under both ASTs identified on this property.
- Fragments of asbestos containing cement board (ACM) were identified within a bund on 94 Barbers Road. The asbestos in soil results from the bund were all 'Asbestos NOT detected'.

Based on the risk to existing and future site users, it is recommended that the six burn areas, the area of dumped material and the TPH contaminated area with contaminants that exceed 'commercial/industrial' SGVs are remediated. Due to the likely presence of contamination exceeding 'commercial/industrial' SGVs and to assist with future soil disposal during the redevelopment of the site, remediation of the three additional burn areas and the ashy soils on a stockpile is also recommended. Remediation can occur prior to or in conjunction with redevelopment of the site. While multiple options are available, in terms of practicality and consenting requirements, excavation and off-site disposal to an approved facility is the likely preferred methodology. The Remediation Action Plan included in this report has been written to support this method. A Site Validation Report should be produced and provided to Christchurch City Council and ECan following the successful remediation of the site

In addition to the recommended remediation, the following actions are recommended for the site:

- The pit on 2 Barbers Road should be managed during redevelopment of the site using an 'Unexpected Contamination Discovery Protocol'. If waste materials other than green waste or hardfill (non-ACM) are found when the pit is excavated, further investigation should be undertaken.
- Site inspections of 111 Pound Road and 40 Hasketts Road should be undertaken prior to redevelopment of the site for industrial use. To date no likely HAIL activities have been identified for 111 Pound Road so a DSI may not be required. Likely HAIL activities have been identified for 40 Hasketts Road and a DSI is likely required.
- The material in the burn pile at 38 Barbers Road should be removed and XRF testing or sampling of the underlying soils undertaken prior to development of this part of the site to confirm the DSI findings that contaminant concentrations do not exceed 'commercial/industrial' SGVs as sampling to date has been limited by the presence of the waste pile.
- The ACM fence should be removed from 64 Barbers Road and disposed of appropriately as per the Health and Safety at Work (Asbestos) Regulations 2016.
- One ACM fragment was identified in the bund of soil at 94 Barbers Road. The presence of further fragments in the bund cannot be ruled out. If the bund is to be removed from site, then it is recommended that further analysis of the bund be completed using a digger to access the deeper soils, in order to determine an appropriate disposal location with confidence. Alternatively, keeping this bund on site and capping it with geofabric and clean soils would address the unknown risk.
- Asbestos surveys should be completed on any structures on the site that are to be demolished during redevelopment of the site. Removal of any identified asbestos containing materials (ACM) should be undertaken prior to demolition to avoid contaminating the surrounding and underlying soils with asbestos during demolition.

Beyond the areas requiring remediation, the Detailed Site Investigations have identified areas with heavy metals elevated above background levels but below 'commercial/industrial' SGVs, and a bund with fragments of ACM. Soils from these areas will not qualify for disposal at Cleanfill facilities. It is recommended that consideration of appropriate disposal facilities for any soils requiring off-site disposal during the redevelopment of the site is undertaken once detailed development plans, including cut and fill requirements, are available. This may require additional sampling.

The soil disturbance and offsite disposal volumes required for the recommended remediation works are likely to comply with permitted volumes. Therefore, the remediation can be carried out as a permitted activity. Any other activities that trigger the NESCS, such as subdivision, will require resource consent under the NESCS as a 'restricted discretionary' activity due to the presence of soil contamination above the applicable standards in Regulation 7.

2 Objectives of the Investigation

This report has been prepared in general accordance with the Ministry for the Environment's (MfE) "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021" (CLMG) and the New Zealand Guidelines for Assessing and Managing Asbestos in Soils, November 2017 (NZ GAMAS). This report includes all requirements for a Preliminary and Detailed Site Investigation Report and Remediation Action Plan.

The objective of this investigation is to:

- Collect and assess information from multiple sources to understand past and current land uses.
- Describe the physical and environmental features of the site to understand potential pathways and receptors.
- Establish whether an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, has been, or is more likely than not to have been undertaken on the site.
- Assess whether there is any risk to potential receptors that would warrant further investigation.
- Collect and analyse site information, including soil sampling and testing, to determine the extent and type of any contamination present.
- Provide remediation and site management recommendations to the client based on the results of the investigation to support the proposed activity.

3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Review of previous investigations on the site.
- Obtaining and review of Environment Canterbury (ECan) data from the Listed Land Use Register (LLUR).
- Search of Land Information New Zealand (LINZ) orchard database.
- Review of relevant historical aerial photographs.
- Review of relevant historical certificates of title (CTs).
- Review of Christchurch City Council property files.
- Designing a sampling and analysis plan based on the identified contaminant risks.
- On site soil sampling and laboratory testing.
- Analysis of results against applicable soil guidelines values (SGVs).
- Preparation of this report in accordance with MfE guidelines.

4 Site Identification

The subject of this investigation is located across several properties between Pound Road, Waterloo Road, Barters Road and Hasketts Road on the outskirts of Christchurch and from herein referred to as 'the site'. The details of the site are listed in **Table 1** and shown on the plan in **Figure 1** below.

Table 1 – Site Details

Street Address	Legal Description	Approximate Site area (ha)
173 Pound Road	Lot 3 DP 33334	9.69
111 Pound Road	Lot 2 DP 33334	10.00
570 Pound Road	Lot 1 DP 33334	9.61
578 Pound Road	Lot 2 DP 20738	0.64
02 Barters Road	Lot 1 DP 20738	0.39
38 Barters Road	Lot 10 DP 23834	4.78
64 Barters Road	Lot 2 DP 38418	2.16
86 Barters Road	Lot 1 DP 38418	9.56
94 Barters Road	Lot 7 DP 23834	2.91
02 Hasketts Road	Lot 6 DP 23834	2.02
22 Hasketts Road	Lot 2 DP 24156	2.03
30 Hasketts Road	Lot 1 DP 24156	2.06
40 Hasketts Road	Lot 2 DP 23834	2.02
48 Hasketts Road	Lot 1 DP 23834	2.49
Total:		60.38

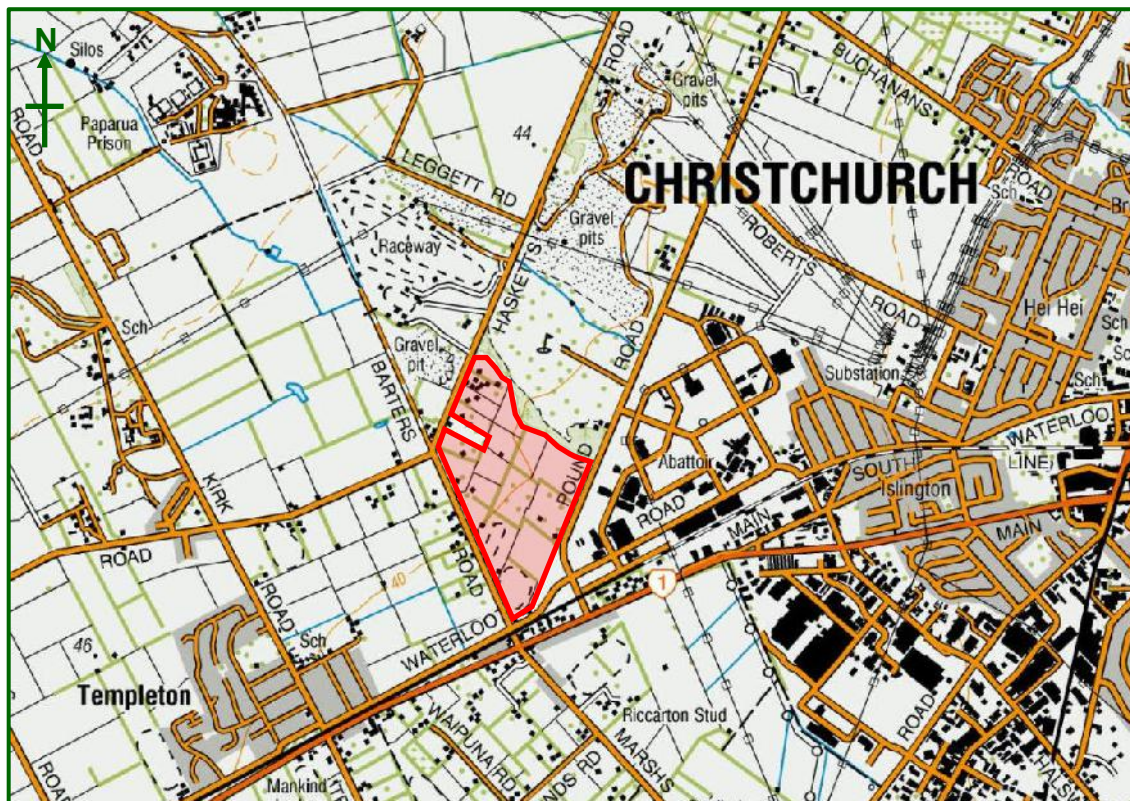




Figure 1 – Location Plan

5 Proposed Site Use

The client is proposing to subdivide the site for industrial use. This will involve subdivision, change of use of the land and likely soil disturbance activities and off-site disposal of soils.

6 Site Description

6.1 Environmental Setting

Table 2 – Environmental Information

Topography	The topography of the site is generally flat.
Geology	The ECan GIS database describes the soils at majority of the site as Waimakariri deep silt/loam and Selwyn deep loam over sand through the middle. Bore log information from nearby wells show surrounding soils generally consist of topsoil's underlain by sandy gravel, followed by clayey gravel.
Soil Trace Elements	According to the ECan GIS database, natural concentrations of trace elements for the site are those of the 'Regional, Recent' soil group.
Groundwater	The site lies over the unconfined and semiconfined gravel aquifer system. Groundwater levels indicated by information from on site and nearby wells show the depth to groundwater between 14.20 and 18m deep. The direction of groundwater flow is generally south-east.
Surface Water	According to the ECan GIS database, there is a drain that runs through the middle of the site. There is also an adjacent drain along Barbers Road to the west and along Pound Road to the east of the site.

6.2 Site Layout and Current Site Uses

The site is rural residential and rural land consisting of 14 different properties. The site currently contains 13 dwellings generally around the perimeter of the site, multiple farm buildings and Waterloo Farm (agria potatoes and onion farming) in the eastern corner.

6.3 Surrounding Land Uses

The site is surrounded by rural residential land to the west and commercial and residential land to the east and south. Ruapuna Speedway and the Templeton Golf Club is to the North.

6.4 Geotechnical Investigations

At the time of writing of this report, no geotechnical investigations were made available to Momentum Environmental Ltd (MEL).

7 Summary of Investigations

Preliminary Site Investigations (PSIs) have previously been completed for some of the properties within the site. Some of those properties have also had Detailed Site Investigations (DSIs) completed. Other properties have no previous investigations. Table 3 below summarises the investigation status of each property prior to this report. Summaries of the previous investigations are then provided in Sections 7.1 and 7.2. All the summarised investigations were completed by Momentum Environmental Ltd (MEL). Full copies of the reports can be provided on request.

Table 3 – Previous Investigation Summary

Street Address	PSI Already Completed?	DSI Already Completed?
173 Pound Road	Yes – Summarised in Section 7.1	No – recommended by PSI
111 Pound Road	No	No – requirement TBC
570 Pound Road	Yes – Summarised in Section 7.1	No – recommended by PSI
578 Pound Road	No	No – requirement TBC
02 Barbers Road	No	No – requirement TBC
38 Barbers Road	No	No – requirement TBC
64 Barbers Road	Yes – Summarised in Section 7.1	Yes – Summarised in Section 7.2
86 Barbers Road	Yes – Summarised in Section 7.1	Yes – Summarised in Section 7.2
94 Barbers Road	Yes – Summarised in Section 7.1	Yes – Summarised in Section 7.2
02 Hasketts Road	Yes – Summarised in Section 7.1	No – recommended by PSI
22 Hasketts Road	Yes – Summarised in Section 7.1	No – recommended by PSI
30 Hasketts Road	Yes – Summarised in Section 7.1	No – recommended by PSI
40 Hasketts Road	No	No – requirement TBC
48 Hasketts Road	No	No – requirement TBC

7.1 Summary of Previous Preliminary Site Investigations

173 Pound Road – April 2022

The subject site was a rural residential lot with street address 173 Pound Road, Islington, Christchurch. Since the 1990s the farmland has been used for growing vegetables such as potatoes, pumpkins and onions. Some use of boron, complexed copper solution and 'Reglone' (Diquat) may have occurred on the subject site and could be considered to be persistent.

The PSI identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site that pose a risk of soil contamination. The following risk areas are present:

- Potential contamination within the farmyard and across the paddock from possible persistent pesticide bulk storage and use since approximately 1990 (HAIL A10).
- Potential contamination from diesel above ground storage tanks (ASTs). One is currently in use and the other appears disused and stored on the ground within a shed (HAIL A17)
- Waste disposal to land has occurred within a burn pile and adjacent stockpile (HAIL G5).

However, the proposed use of the subject site is commercial/industrial. This is not a sensitive land use and applicable human health soil guideline values are generally high. It is considered highly unlikely that any contamination from persistent pesticide bulk storage or use, or the diesel ASTs would exceed 'commercial/industrial' soil guideline values. Therefore, these areas are considered highly unlikely to pose a risk to human health in a commercial/industrial use and further investigation is not required unless a more sensitive future use is proposed.

Previous experience of investigating similar burn areas has shown that contamination exceeding 'commercial/industrial' soil guideline values may be present in the burn pile risk area. Therefore, it was recommended that a Detailed Site Investigation be undertaken on this risk area. The location of this risk area is shown on the Site Inspection Plan in **Appendix A**.

Due to the identified HAIL activities, it was considered likely that contamination above background levels will be present on the subject site. Therefore, if any soils require off-site disposal from the subject site, it recommended that a Detailed Site Investigation be undertaken over the entire subject site to inform disposal options.

38 Barters Road & 570 Pound Road – August 2024

The subject site consisted of a rural residential lot and a rural lot with street addresses 38 Barters Road and 570 Waterloo Road, Templeton, Canterbury. The PSI, including limited XRF screening, identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site and there may be a risk to human health from contaminated soils. The following HAIL activities have been identified:

- An area of elevated lead, likely from the use of lead-based paints on a former pre-1941 building. (HAIL I)
- Heavy metal contamination within an existing burn area (HAIL I).

The locations of these risk areas are shown on the Site Inspection Plan in **Appendix A**. The Conceptual Site Models indicated the elevated heavy metals pose a low risk to human health under current rural residential use, a low risk to human health under the proposed industrial use and a low risk to the environment. However, the contaminant concentrations within the burn area are not yet fully known as XRF testing could only be performed on the periphery of the existing burn pile. It was recommended that a Detailed Site Investigation, in terms of the Ministry for the Environments Contaminated Land Management Guidelines, be undertaken on the burn area prior to development of the subject site and after the material in the burn pile is removed. Soil sampling of the former building area may also be necessary for waste facility acceptance if off-site disposal of soils from this area is required.

64, 86 & 94 Barters Road – December 2023

The subject site consisted of three rural residential lots with street addresses 64, 86 and 94 Barters Road, Templeton, Canterbury. The PSI identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site:

- A potential livestock dip or spray race operation in animal yards visible in the 1962 aerial photograph at 86 Barters Road (HAIL A8).
- The potential use of farm structures for storage and mixing of persistent pesticides on both 86 and 94 Barters Road from as early as 1941 (HAIL A10).
- A rusted aboveground fuel storage tank present at 94 Barters Road (HAIL A17).
- A broken fence likely containing asbestos at 64 Barters Road (HAIL E1).
- Historical structures both existing and demolished posing a risk of lead contamination in surrounding soils at 86 and 94 Barters Road (HAIL I).
- Burn areas at 86 and 94 Barters Road (HAIL I).
- Storage areas including items of scrap such as metal, plastic and wood at 86 Barters Road (HAIL I).
- A bund of soils containing demolition debris at 94 Barters Road (HAIL I).

There may be a risk to human health from contaminated soils in the locations of these activities. It was recommended that further investigation of the risk areas in the form of a Detailed Site Investigation be completed, prior to development of the site.

4, 22 & 30 Hasketts Road – August 2024

The subject site consisted of three rural residential lots with street addresses 4, 22 and 30 Hasketts, Templeton, Canterbury. The PSI identified confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site and there may be a risk to human health from contaminated soils. The following HAIL activity was identified:

- Possible heavy metal contamination within existing and possible former burn areas (HAIL I).

The PSI also included soil sampling around the dwellings on 22 and 30 Hasketts Road which have decramastic tile roofs. The surface soils were sampled on each side of the two dwellings and submitted for asbestos presence/absence analysis. No asbestos was detected in any of the eight samples. It is considered highly unlikely that the decramastic roofs have caused asbestos contamination of the soils around these two dwellings.

It was recommended that a Detailed Site Investigation, in terms of the Ministry for the Environment's Contaminated Land Management Guidelines, be undertaken on the identified risk areas prior to development. The locations of these risk areas are shown on the Site Inspection Plan in **Appendix A**.

7.2 Summary of Previous Detailed Site Investigations

64, 86 & 94 Barters Road – February 2024

The subject site consisted of three rural residential lots with street addresses 64, 86 and 94 Barters Road, Templeton, Canterbury. Soil sampling was undertaken on 24 January 2024.

The laboratory results showed arsenic concentrations above the 'commercial/industrial' soil guideline value (SGV) of 70mg/kg at sample location BP2 within the burn area at 94 Barters Road. The arsenic result at sample location BP2 was 179mg/kg. There were no other exceedances of the 'commercial/industrial' SGVs at the site. It is noted that the arsenic result at BP1 was 69mg/kg which is only just below the 'commercial/industrial' SGV and XRF testing detected 80mg/kg of arsenic within this burn area.

Lead and zinc concentrations exceeded the Ecological Guideline Values (EGVs) in multiple sample locations across the site. The suspected asbestos fence on 64 Barters Road was confirmed to contain Chrysotile (white asbestos), however, no asbestos contamination of the surrounding soil appears to have occurred. A cement board fragment found in the bund of soil at 94 Barters Road was confirmed to contain Chrysotile (white asbestos) and Amosite (brown asbestos). The presence of further fragments in the bund cannot be ruled out. No asbestos was detected in the soil samples submitted for asbestos analysis. Copies of the Sample Location Plans are included in **Appendix A**.

The following recommendations were made for the subject site.

- Remediation of the arsenic contaminated burn area on 94 Barters Rd. A Remediation Action Plan (RAP) will be required
- Remediation of burn area BP1 on 86 Barters Rd due to high levels, albeit below 'commercial/industrial' SGVs, of cadmium, copper, lead and zinc to assist with future soils disposal during development of the site. A Remediation Action Plan (RAP) will be required.
- Removal of the asbestos cement fence and all other suspected ACM (currently in good condition on buildings) from 64 Barters Rd.
- Undertake further assessment of the asbestos within the bund on 94 Barters Rd or cap the bund.
- Robust erosion and sediment control measures will need to be implemented during any future earthworks on site to ensure contaminated soils do not enter adjacent waterways.
- Based on the presence of contaminant concentrations above expected background values in nearly every sample location, soils requiring off-site disposal from the investigated area

are not suitable for disposal as cleanfill material. Soils from pastoral areas of the site where contaminating activities (HAIL areas) were not identified are likely to be suitable for disposal as cleanfill but further sampling may be required to confirm this.

8 Additional Preliminary Site Investigations

This section describes the work undertaken to complete Preliminary Site Investigations for the properties within the site that have no previous Preliminary Site Investigations:

- 111 Pound Road,
- 578 Waterloo Road,
- 2 Barters Road,
- 40 Hasketts Road
- 48 Hasketts Road.

8.1 Historical Site Use

8.1.1 Previous Site Ownership and Use

Historical Certificates of Title (CTs) were reviewed with the following relevant ownership information outlined below. Bolded information indicates potentially contaminating activities:

111 Pound Road

26 August 1902	Edward Jeffs and Charles Thomas Jeffs, both farmers (south-east half of property)
28 May 1927	Nathan Clegg, bonemiller (north-west half of property)
22 July 1927	Andrew Richard Carter, farmer (north-west half of property)
13 May 1936	John Gerald Carter and Harold Selwyn Carter, both farmers
24 October 1951	John Gerald Carter, farmer
21 August 1959	Norman Dean Thomas, farmer
28 June 1960	Leslie Gray Thomas, farmer
18 June 1965	William Maurice Denton, stud master
11 October 1973	N.Z. Refrig. Nominees Ltd
09 September 1977	Waitaki N.Z. Refrigerating Ltd
28 September 1988	PPCS Islington Ltd
19 June 1989	Warwick John Wright, product manager and Marianne Johanna Wright, office manager

578 Waterloo Road

26 August 1902	Edward Jeffs and Charles Thomas Jeffs, both farmers
31 March 1944	John Gerald Carter and Harold Selwyn Carter, both farmers
18 April 1945	Sarah Mortland, widow
09 February 1959	Mary Ann Mortland, spinster
17 November 1959	John Gerald Carter, farmer
02 November 1978	Nicholas George Clark, solicitor and Rex Ralph Armstrong, accountant
07 August 1980	Frank Ridley Hooper, timber machinist and Isobel Kerzia Hooper, his wife

2 Barters Road

26 August 1902	Edward Jeffs and Charles Thomas Jeffs, both farmers
31 March 1944	John Gerald Carter and Harold Selwyn Carter, both farmers
18 April 1945	Sarah Mortland, widow
09 February 1959	Mary Ann Mortland, spinster

29 July 1980	Bruce Leslie Stanley, solicitor, Raymond John Campion, farmer and Melford David Mortland, welder
05 April 1981	Jurrie Arnoldus Kerkvliet, butcher and Marie Beverley Kerkvliet, his wife
26 March 1982	Graeme Charles Main, branch manager and Belinda Margaret Main, his wife
21 October 1993	Graeme Charles Main, finance manager
26 January 1994	Richard Hamish Gerard, farmer and Sarah Kathleen Gerard, shipping instructor
04 August 1997	Barry William Grives and Jan Patricia Grives
11 December 2009	Stuart Matthew Ward and Vicki Lee Ward

40 Hasketts Road

28 May 1927	Nathan Clegg, bonemiller (north-west half of property)
22 July 1927	Andrew Richard Carter, farmer (north-west half of property)
13 May 1936	John Gerald Carter and Harold Selwyn Carter, both farmers
24 October 1951	John Gerald Carter, farmer
21 August 1959	Norman Dean Thomas, farmer
28 June 1960	Leslie Gray Thomas, farmer
15 July 1965	Peter Harris, labourer
13 October 1970	Charles Ernest Titterton, farmer
19 June 1972	Heather Elaina Titterton, widow
25 October 1973	Robert Hardie, chicken farmer and Jean Hardie, his wife
21 March 1996	Jean Hardie, retired
26 February 1999	Housing Corporation of New Zealand Ltd
11 February 2025	Housing New Zealand Ltd

48 Hasketts Road

28 May 1927	Nathan Clegg, bonemiller (north-west half of property)
22 July 1927	Andrew Richard Carter, farmer (north-west half of property)
13 May 1936	John Gerald Carter and Harold Selwyn Carter, both farmers
24 October 1951	John Gerald Carter, farmer
21 August 1959	Norman Dean Thomas, farmer
28 June 1960	Leslie Gray Thomas, farmer
29 June 1965	Johannes Theodorus Knalman, psychiatric nurse
13 December 1965	William Harris, labourer
01 October 1971	Graham John Farquhar Herriott, market gardener and Clio Mary Herriott, his wife
15 September 1977	Noel Wilfred Borlase, real estate agent
31 October 1996	Ian Stewart Cameron, solicitor and John Allan William Borlase, police officer
22 January 1999	Megan Jane Chamberlain and Suzanne Jane Gilliland
15 December 2000	Maxwell John Doolan and Anne Lorraine Doolan
25 February 2010	Christchurch City Council

Note that some of the older information was of poor quality and difficult to follow, therefore the accuracy of the spelling of names and dates is not guaranteed. Copies of the historical CTs are included in **Appendix B**.

8.1.2 District Authority Records

The site is within the Rural Urban Fringe Zone in the Christchurch District Plan.

The property files were received from Christchurch City Council and reviewed on 28 April 2025. The property files included the following consents and permits for each property:

111 Pound Road

- Building permit issued in November 1990 to erect a store and deer shed.
- Building permit issued in October 1990 to erect a dwelling.
- Building consent issued in October 1995 for internal loft additions.
- Building consent issued in June 1996 for additions to a deer shed.
- Building consent issued in May 2015 for additions to the dwelling (two covered canopies)
- Amendment to previous building consent for additions to the dwelling accepted in December 2015.
- Building consent issued July 2017 to reconstruct a deck and relocate a bedroom wall.
- Building act exemption granted July 2024 for partial interior renovation of existing dwelling.
- Building consent issued in September 2024 for internal alterations to dwelling.

578 Waterloo Road

- Building consent issued July 2003 to install a solid fuel heater.

2 Barbers Road

- A Land Information Memorandum (LIM) issued in 2008 indicates a building permit was issued November 1962 to erect a storeroom and pump house but no further details provided within property file.
- Building permit issued in May 1982 to erect a garage and extend the dwelling.
- Building permit issued in June 1982 to install a solid fuel heater.
- Building consent issued in May 2010 to install a solid fuel heater.

40 Hasketts Road

- Building permit issued in March 1966 for a corrugated iron stable/horse loose box.
- Building permit issued in October 1970 for two broiler chicken sheds. The walls and roof were to be constructed from wood and iron.
- Building permit issued in May 1982 for a solid fuel heater.
- Building permit issued in May 1982 for alterations to the dwelling, to be constructed with Summerhill stone walls and a tile roof.
- Building permit issued in June 1983 to erect a corrugated iron and pole shed.
- Building permit issued in March 1983 to erect a garage with block walls, iron roof and concrete floor.
- Building consent issued in March 1999 to change the use of and make additions to a private home for 6 intellectually and physically disabled persons and carer.
- Resource consent to establish, operate and maintain residential accommodation for up to six people as well as a rural gardening programme for up to 20 people was granted in April 1999.
- Building consent issued in May 1999 to convert the garage to a lunch room and add toilets.
- Building consent issued in June 1999 for a solid fuel heater.
- Building consent issued in July 1999 for a tunnel house.
- Building consent issued in September 2002 to erect a workshop with a concrete floor.

- Building consent issued in June 2009 for alterations to fire safety systems.
- Building consent issued in May 2011 for bathroom alterations.
- Building consent issued in July 2012 for a solid fuel heater.

48 Hasketts Road

- Land Information Memorandum (LIM) issued in 2000, 2007 and 2024 do not contain any information indicating a risk of soil contamination.
- Building permit issued in September 1971 to erect an implement shed.
- Building permit issued in March 1972 to erect a dwelling.
- Building permit issued March 1973 to erect a shed.
- Building permit issued January 1974 for additions to the dwelling.

8.1.3 Regional Council Records

A statement for the properties under investigation was downloaded from ECan's Listed Land Use Register (LLUR) for land use activities and industries associated with the Hazardous Activities and Industries List (HAIL).

- 111 Pound Road is not listed on the LLUR.
- 578 Waterloo Road is not listed on the LLUR.
- 2 Barters Road is not listed on the LLUR.
- Part of 40 Hasketts Road is listed on the LLUR for HAIL activity 'A11 – Pest control'
- 48 Hasketts Road is not listed on the LLUR.

Seven nearby sites are listed on the ECan LLUR:

- Site 1425, Templeton Country Club: listed as 'Verified HAIL has not been investigated' under categories 'A17 – Storage tanks or drums for fuel, chemicals or liquid waste' and 'A10 – Persistent pesticide bulk storage or use'. A review of aerial photographs noted the use of the site as a golf course from 1965 onwards. Two underground fuel storage tanks (USTs) were noted to be present on the site in 1993.
- Site 1838, Shell Templeton, 720 Main South Road: listed for 'F3 – Engine reconditioning workshops' and 'F7 – Service stations'. A service station with underground fuel storage tanks has been present since at least 1993. The site is categorised as 'Verified HAIL has not been investigated'.
- Site 2083, C.B. Norwood, 726 Main South Road: listed for 'A17 – Storage tanks or drums for fuel, chemicals or liquid waste' and 'F3 – Engine reconditioning workshops'. The site is the location of a farm machinery centre. The site is categorised as 'Verified HAIL has been partially investigated' as soils around a waste oil tank were sampled when the tank was removed. The sampling results showed Total Petroleum Hydrocarbons (TPH) below laboratory limits of detection. Other potential sources of contamination e.g. the workshop have not been investigated.
- Site 3286, Drummond & Etheridge Ltd (Christchurch), 712 Main South Road: listed for 'F4 – Motor vehicle workshops'. The site is categorised as 'Verified HAIL has not been investigated'.
- Site 3433, Templeton Panel Beaters, 724 Main South Road: listed for 'F4 – Motor vehicle workshops'. A panel beating workshop has been present since 2000. The site is categorised as 'Verified HAIL has not been investigated'.
- Site 26990, Barters Road: listed for 'A10 – Persistent pesticide bulk storage or use' as market garden plots and a glass house were noted in aerial photographs between 1965 and 1984. The site is categorised as 'Verified HAIL has not been investigated'.

- Site 88775, Effluent disposal areas, Former PPCS Islington, Waterloo Road: listed as 'Below guideline values – Industrial/Commercial' under categories 'G6 – Waste recycling or waste or wastewater treatment' and 'G5 – Waste disposal to land'. The former PPCS Islington meat processing plant was located at 390 Waterloo Road from 1869 until 1988. Effluent from the plant was passed through four large unlined oxidation ponds before dispersal on surrounding pasture. This listed site encompasses the known extent of that dispersal. Detailed Site Investigations (DSI) on the effluent disposal areas in 2006 by Glasson Potts Fowler Ltd (GPF) reported that concentrations of heavy metals, organochlorine pesticides (OCP), organonitrogen and organophosphorus pesticides (ONOP) complied with applicable soil guideline values (SGVs) for residential use.

The full LLUR Statement is included in **Appendix C**.

Resource consent information was sourced from the ECan GIS database. For the properties currently under investigation:

- There is an active resource consent for 111 Pound Road to take and use groundwater.
- There is an active resource consent for 40 Hasketts Road to discharge domestic wastewater into land.
- There are no active resource consents for 578 Waterloo Road, 2 Barbers Road, or 48 Hasketts Road.

Within 100m of the properties under investigation:

- 146 Barbers Road and 35 Hasketts Road (to the north-west of 40 and 48 Hasketts Road) has active resource consents related to its use as a quarry and clean fill facility. The resource consents include: to use land for the deposition of material (cleanfill) into excavated land, to discharge leachate from cleanfill deposited into or onto excavated land and to discharge contaminants to air from extraction, handling, processing and conveying of bulk material as a result of deposition of material onto and or into land.
- 173 Pound Road (north of 111 Pound Road) has an active resource consent to take and use groundwater.
- There are several active resource consents for land within the Waterloo Business Park (south-east of 111 Pound Road) to discharge stormwater to land.
- There are active resource consents south-east of 2 Barbers Road to discharge to air contaminants from a spray painting booth and associated gas-fired bake oven and to discharge contaminants to air from a pellet fuel burner.

Bore information was sourced from the ECan GIS. Active bores on the properties currently under investigation include:

- M35/5530, an irrigation, domestic and stockwater supply bore on 111 Pound Road
- M36/2000, a domestic and stockwater supply bore on 578 Waterloo Road
- M36/2001, a domestic supply bore on 2 Barbers Road
- M35/3370, a domestic and stockwater supply bore on 40 Hasketts Road
- M35/1109, a domestic supply bore on 48 Hasketts Road

There are several other active bores with similar uses within 100m of the properties under investigation.

8.1.4 LINZ Records

The LINZ orchard layer does not show the site, or any directly surrounding properties as having listed orchards.

8.1.5 Review of Historical Aerial Photographs

Historical aerial photographs have been sourced from the ECan GIS database to assess the historical use of the site. Copies of the aerial photographs used are included in **Appendix D**. For ease of display on the aerial photograph copies, the properties have been divided into two groups.

111 Pound Road, 578 Waterloo Road, 2 Barters Road

Table 4 – Summary of aerial photograph information for 111 Pound Rd, 578 Waterloo Rd & 2 Barters Rd

Date	Site Description	Surrounding Land Description
1941	111 Pound Road - is in pasture 578 Waterloo Road - is in pasture with some small animal shelters toward the southern end 2 Barters Rd - has a dwelling, garage and farm sheds present. One long farm shed extends into the neighbouring property.	The surrounding land is mainly pastoral farmland. A railway line is present to the south-east of 2 Barters Rd. Residential properties are present to the south-east of the railway line.
1955	Only part of 111 Pound Road is included on the aerial photograph. No apparent changes to any of the three properties.	Only a partial aerial photograph. No apparent changes to the surrounding land.
1965	111 Pound Rd - No significant changes 578 Waterloo Rd - A dwelling and farm sheds are now present on the southern end of the property. 2 Barters Rd - the long farm shed has been removed. A domestic vegetable patch is now present to the north-east of the dwelling.	Commercial properties are now present to the south-east of 2 Barters Rd. Residential development has occurred along Main South Rd to the south-east of 2 Barters Rd and 578 Waterloo Rd.
1974	No significant changes to any of the three properties.	Horticultural activities occurring to the south-east of 111 Pound Rd and 578 Waterloo Rd. Rural residential development has occurred along Barters Rd.
1984	111 Pound Rd - No significant changes 578 Waterloo Rd - No significant changes 2 Barters Rd - A new building (garage?) is present to the north-west of the dwelling. The vegetable patch is no longer visible.	A horse training track is now present to the south of 111 Pound Rd.
1994	111 Pound Rd - A dwelling has been constructed on the southern corner. A shed is present toward the middle of the property. The remainder of the property has been divided into smaller paddocks. 578 Waterloo Rd - No significant changes 2 Barters Rd - No significant changes	Farm sheds have been constructed on 173 Pound Rd to the north of 111 Pound Rd.
2000	111 Pound Rd - No significant changes 578 Waterloo Rd - No significant changes 2 Barters Rd - No significant changes	Horticultural activities appear to be occurring to the north of 111 Pound Rd. Horticultural activities to the south-east of 111 Pound Rd and 578 Waterloo Rd appear to have ceased.

2005	111 Pound Rd - No significant changes 578 Waterloo Rd - No significant changes 2 Barbers Rd - No significant changes	No significant changes
2012	111 Pound Rd - No significant changes 578 Waterloo Rd - No significant changes 2 Barbers Rd - No significant changes	No significant changes
2020	111 Pound Rd - No significant changes 578 Waterloo Rd – A possible burn area is visible to the north of the buildings. 2 Barbers Rd – A container shelter has been added to the northern corner.	Layout of Waterloo Rd and Pound Rd has been amended. Waterloo Business Park is now present to the east of 111 Pound Rd.

40 & 48 Hasketts Road

Table 5 – Summary of aerial photograph information for 40 & 48 Hasketts Rd

Date	Site Description	Surrounding Land Description
1941	40 and 48 Hasketts Road are both pastoral farmland.	Templeton Country Club is present to the north-east. The remaining surrounding land is pastoral farmland.
1962	A horse training track is now present spanning the north-west end of 40 and 48 Hasketts Rd.	No significant changes
1974	40 Hasketts Rd - A dwelling, garage, three farm sheds and two poultry sheds have been added. 48 Hasketts Rd - A dwelling and farm shed have been added. Possible market gardening activities are occurring around these buildings.	A horse training track is present to the west. Rural residential development has occurred to the south.
1984	40 Hasketts Rd - The poultry sheds have been removed. A new farm shed is present within the footprint of one of the former poultry sheds. The three previously observed farm sheds have been altered/extended. 48 Hasketts Rd - The possible market gardening activities appear to have ceased. Several animal shelters are now present within the paddocks.	Farm sheds are now present to the south of 40 Hasketts Rd.
1994	40 Hasketts Rd - No significant changes 48 Hasketts Rd - No significant changes	No significant changes
2000	40 Hasketts Rd - Horticultural activities occurring toward the middle of the property with a glasshouse and a possible market garden plot. 48 Hasketts Rd - No significant changes	Ruapuna speedway is now present to the north.
2005	40 Hasketts Rd – The possible market gardening area is now grassed. 48 Hasketts Rd - No significant changes	No significant changes

2012	40 Hasketts Rd – Trees have been planted on the south-east end of the property. Market garden plots are present to the north and east of the glasshouse. 48 Hasketts Rd - No significant changes	No significant changes
2020	40 Hasketts Rd - No significant changes 48 Hasketts Rd - No significant changes	Quarrying activities are now occurring to the west.

8.2 Site Inspection

Site inspections of three of the five properties covered by this preliminary site investigation were completed and are summarised below. Site Inspection Plans detailing the structures on the properties and any potential sources of contamination are included in **Appendix E**.

111 Pound Road

Access to 111 Pound Road was not possible at the time of this investigation. A site inspection to establish whether any potential sources of contamination, not identified by the desktop portion of this investigation, are present on the property should be completed prior to development of the property for industrial use.

578 Waterloo Road

A site inspection was completed on 07 May 2025. The dwelling is constructed from Summerhill stone with a tile roof. A small diesel above ground storage tank (AST) is present on the northern corner of the dwelling. There was no visual or olfactory evidence of any leaks. A stucco and iron garage is present to the north of the dwelling. Corrugated iron sheds are present to the north-east of the dwelling. No potential sources of contamination that would pose a risk to human health in a commercial/industrial use were observed around the structures on the property.

To the north of the shed is a burn area with a strong burn odour and ashy material up to 600mm high. The current owner stated that burning had occurred at this location for a significant period of time.

There were no potential sources of contamination or structures present on the remainder of the property. Only the portion of the property with structures and potential sources of contamination has been included on the Site Inspection and Sample Location Plan in **Appendix E**.



Photo 1 – 578 Waterloo Rd Dwelling



Photo 2 – Diesel AST by dwelling



Photo 3 – Stucco garage



Photo 4 – Driveway with shed in background



Photo 5 – Farm sheds and animal shelter



Photo 6 – Burn area

2 Barters Road

A site inspection was completed on 07 May 2025. The dwelling is a stucco clad building with decramastic tile roof in good condition. There is a concrete block garage to the north-west of the dwelling. There is a corrugated iron garage to the south of the dwelling with an adjacent iron carport. The area between the garages is gravelled.

Beyond the residential area of the property are several corrugated iron sheds and a shipping container shelter. A pit is located near the northern boundary. The visible pit contents include green waste and concrete blocks. An adjacent stockpile of silty gravels is most likely sourced from the pit excavation. More stockpiles of silty gravels are present to the south of the pit. The source of these stockpiles is unknown. Ashy, burnt soils, brick and scrap metal were present on the surface of one of these stockpiles.



Photo 7 – 2 Barbers Rd dwelling



Photo 8 – Concrete block garage & dwelling



Photo 9 – Iron garage & carport



Photo 10 – Shipping container shelter



Photo 11 – Iron shed



Photo 12 – Iron & timber sheds



Photo 13 – Iron shed



Photo 14 – Pit with green waste & concrete block



Photo 15 – Stockpile adjacent to pit



Photo 16 – Stockpiles to the south of the pit



Photo 17 – Ashy soils & waste items on stockpile



Photo 18 – Tree removal & firewood processing area

40 Hasketts Road

Access to 40 Hasketts Road was not possible at the time of this investigation. A site inspection to establish whether any potential sources of contamination, not identified by the desktop portion of this investigation, are present on the property should be completed prior to development of the property for industrial use.

48 Hasketts Road

A site inspection was completed on 07 May 2025. No suspected asbestos containing materials (ACM) in a deteriorated state was observed on the property. The structures on the property include a dwelling with attached garage, several farm sheds and several animal shelters. The dwelling is constructed from concrete block walls and a corrugated iron roof. The farm sheds are either constructed from wood, corrugated iron or concrete blocks with iron roofs. No potential sources of contamination were observed during the site inspection.



Photo 19 – Dwelling



Photo 20 – Garage attached to dwelling



Photo 21 – Farm sheds & loading ramp



Photo 22 – Concrete block animal shelter



Photo 23 – Farm shed & water tank



Photo 24 – Farm shed/stables

8.3 Preliminary Risk Assessment

8.3.1 Potential HAIL Uses

The Hazardous Activities and Industries List (HAIL) compiled by the Ministry for the Environment identifies industries and activities that are considered potentially contaminating. Based on historical land uses and the information reviewed above, the following categories (*in italics*) have been identified for the properties currently under investigation, including a summary of the risks associated with such activities. A summary table of the PSI findings is included in **Appendix F**.

A – Chemical manufacture, application and bulk storage

10 – Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

40 Hasketts Road: Horticultural use of part of the property with a glasshouse and market garden plots was observed on aerial photographs from 2000 onwards. Given the era of the activities, contaminants of concern include heavy metals and organophosphorus pesticides (ONOPs)

48 Hasketts Road: The property was owned by a market gardener between 1971 and 1977. Possible market gardening activities were observed on aerial photographs in the 1970s. Given the era of the activities, contaminants of concern include heavy metals and organochlorine pesticides (OCPs).

11 – Pest control, including the premises of commercial pest control operators or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application

40 Hasketts Road: Part of this property is listed on the LLUR for HAIL A11 due to the presence of poultry sheds. According to aerial photographs the poultry sheds were present during the 1970s. Given the era of the activities, contaminants of concern include heavy metals and OCPs.

E – Mineral extraction, refining and reprocessing, storage and use

1 - Asbestos products manufacture or disposal, including sites with buildings containing asbestos products known to be in a deteriorated condition

No suspected asbestos containing materials (ACM) in a deteriorated state were observed during the site inspections undertaken. Given the relatively modern buildings at 111 Pound Road, the use of ACM on buildings is considered unlikely. Given the use of 40 Hasketts Road as residential accommodation for disabled persons, it is considered unlikely that ACM in a deteriorated state would be allowed to remain on site. HAIL E1 is considered unlikely to apply to the site.

G – Cemeteries and waste recycling, treatment and disposal

5. Waste disposal to land

578 Waterloo Rd: A pit is present with visible waste items including green waste and concrete blocks. If only green waste and hardfill have been deposited in the pit, then the risk of contamination is low. However, if other materials have been deposited contamination of the soils may have occurred. Contaminants of concern depend on materials deposited but may include heavy metals.

Stockpiles of silty gravels are also present. One appears to have been sourced from the pit. The source of the others is unknown. One stockpile appears to have ashy soils and burnt items on its surface. Contaminants of concern include heavy metals.

H – Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

Based on the information in the LLUR statement and the review of aerial photographs, no potentially contaminating activities on adjacent land have been identified that would pose a risk of migration of contaminants in sufficient quantity to pose a risk to human health in an industrial use or to the environment.

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

578 Waterloo Road – buildings have been present on this property since sometime between 1941 and 1965. Lead-based paints and/or asbestos containing materials (ACM) may have been used on these buildings. However, the site inspection showed the dwelling was constructed from Summerhill stone and no suspected ACM in a deteriorated state was observed. It is considered highly unlikely that contamination from the use of lead-based paints or ACM will be present in sufficient quantities to pose a risk to human health in an industrial use.

A burn area is present on the property, visual evidence and the knowledge of the current owner indicates burning has occurred in this location for a long time. Contaminants of concern include heavy metals.

2 Barthers Road – buildings have been present on this property since at least 1941. Lead-based paints may have been used on these buildings. Any natural deterioration or intentional removal may have caused contamination of the surrounding soils. No ACM in a deteriorated state was observed during the site inspection. Contaminants of concern include heavy metals.

40 Hasketts Road – buildings have been present on the property since the 1970s. ACM may have been used on these buildings. Any natural deterioration or intentional removal may have caused contamination of the surrounding soils. Contaminants of concern include asbestos.

A horse training track was present on the property on the 1962 aerial. The track surface material may have included coal ash. Contaminants of concern include heavy metals and PAHs

48 Hasketts Road – buildings have been present on the property since the 1970s. ACM may have been used on these buildings. However, no ACM in a deteriorated state was observed during the site inspection. It is considered highly unlikely that asbestos contamination of the soils around the buildings will have occurred.

A horse training track was present on the property on the 1962 aerial. The track surface material may have included coal ash. Contaminants of concern include heavy metals and PAHs.

8.3.2 Preliminary NESCS Assessment

In relation to the NESCS, Regulation 5(7) states that land is considered to be covered if an activity or industry described in the HAIL is being undertaken; has been undertaken; or is more likely than not to have been undertaken on it. Regulation 6 describes the methods for determining this. Method 6(3) is to rely on a Preliminary Site Investigation. The 'NESCS Users Guide' indicates the

test for ‘more likely than not’ is whether there is more than a 50 percent likelihood of the HAIL having occurred.

The table below states the likelihood of each HAIL identified in **Section 9.1** above for the properties currently under investigation:

Table 6 – Preliminary NESCS Assessment

HAIL Category	6(3)a - Is being undertaken	6(3)b – has been undertaken	6(3)c – likelihood of having been undertaken (if not confirmed)
HAIL A10 – persistent pesticide bulk storage or use	-	-	More likely than not (40 Hasketts Rd, 48 Hasketts Rd)
HAIL A11 – Pest control	-	-	More likely than not (40 Hasketts Rd)
HAIL E1 – Asbestos materials in a deteriorated condition	-	-	Unlikely (not yet ruled out for 111 Pound Rd or 40 Hasketts Rd)
HAIL G5 – waste disposal to land	Yes (2 Barbers Rd)	-	-
HAIL H – migration of hazardous substances	-	-	Highly unlikely
HAIL I – any other land (lead paint &/or asbestos)	-	-	More likely than not (2 Barbers Rd, 40 Hasketts Rd)
HAIL I – any other land (burn areas)	-	Yes (578 Waterloo Rd)	-
HAIL I – any other land (coal ash on horse training track)	-	-	More likely than not (40 Hasketts Rd, 48 Hasketts Rd)

8.3.3 Preliminary Conceptual Site Model

The following preliminary conceptual site model (CSM) indicates potentially complete exposure pathways associated with the identified risks at the properties currently under investigation. The identified risks include:

- Potential heavy metal and OCP contamination from horticultural activities occurring at the 48 Hasketts Rd in the 1970s.
- Potential heavy metal and ONOP contamination from horticultural activities occurring at 40 Hasketts Rd from 2000 onwards.
- Potential heavy metal and OCP contamination from pest control within poultry sheds on 40 Hasketts Rd in the 1970s.
- Possible heavy metal contamination within a pit and nearby stockpiles including one with visible ashy soils and burnt items on 2 Barbers Rd.
- Possible heavy metal contamination from the use of lead-based paints on 2 Barbers Rd.
- Possible asbestos contamination from 1970s era buildings on 40 Hasketts Rd.
- Possible heavy metal contamination within burn area at 578 Waterloo Rd.
- Possible heavy metal and PAH contamination on a former horse training track across 40 and 48 Hasketts Rd.

Table 7 – Preliminary Conceptual Site Model

Preliminary Conceptual Site Model				
Source	Pathways		Receptor	Exposure Pathway Status
Areas of potential heavy metal, OCP, ONOP, PAH and/or asbestos contamination from previous and current uses at the properties. All identified sources are likely to lead to surface/shallow contamination of soils.	Human	Dermal contact, ingestion and inhalation through soil contact	Current and future site occupiers	Potentially complete
			Workers involved in soil disturbance activities	Potentially complete.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.20 - 18m deep.	Likely incomplete given depth to groundwater.
		Surface runoff to waterways	Open drain on site and open drain adjacent to site.	Potentially complete.

Based on the NESCS assessment and the preliminary CSM above, the NESCS does apply to the site and further assessment of the identifies risk areas, in the form of a Detailed Site Investigation (DSI), is recommended.

9 Additional Detailed Site Investigations

9.1 Summary of Risk Areas

The Preliminary Site Investigation (PSI) completed in section 8 and the previously undertaken PSIs for the remaining properties within the site (summarised in section 7.1) identified several areas at risk of contamination and recommended Detailed Site Investigations be undertaken. Detailed Site Investigations have already been undertaken for 64, 86 & 94 Barters Road, this report is summarised in Section 7.2 above. It is not currently possible to undertake Detailed Site Investigations at 111 Pound Road or 40 Hasketts Road due to no access permission.

The identified risk areas currently under investigation include:

173 Pound Road

- Potential contamination within the farmyard and across the paddock from possible persistent pesticide bulk storage and use since approximately 1990.
- Potential contamination from diesel above ground storage tanks (ASTs).
- Waste disposal to land has occurred within a burn pile and adjacent stockpile.

578 Waterloo Road

- Possible heavy metal contamination within a burn area.

2 Barters Road

- Possible heavy metal contamination from the use of lead-based paints on existing and former pre-1941 buildings.
- Possible contamination within a pit. Current observations indicate the risk of contamination within this pit is low. It is also unlikely that the pit could be sampled adequately without an excavator which would be disruptive to the current owners. It is recommended that the pit be managed during development of the site for industrial use as per the 'Unexpected Contamination Discovery Protocol' in **Section 14**, so that if waste materials other than

green waste or hardfill (non-ACM) are found when the pit is excavated that further investigation be undertaken.

- Possible heavy metal contamination within stockpiles of silty gravels including one with ashy soils and waste items.

38 Barthers Road & 570 Waterloo Road

- Possible heavy metal contamination within a burn area.
- Possible heavy metal contamination from the use of lead-based paints on a former pre-1941 building.

4, 22 & 30 Hasketts Road

- Possible heavy metal contamination within five burn areas.

48 Hasketts Road

- Potential heavy metal and OCP contamination from horticultural activities occurring at the 48 Hasketts Rd in the 1970s.
- Possible heavy metal and PAH contamination on a former horse training track on 48 Hasketts Rd in the 1960s.

The approximate locations of the identified risk areas are shown on the Risk Areas Plan in **Figure 2** below. Due to their small size, burn areas are marked with a yellow 'X'. The pit, stockpiles and ashy soils identified on 2 Barthers Rd are shown as a red 'X'.

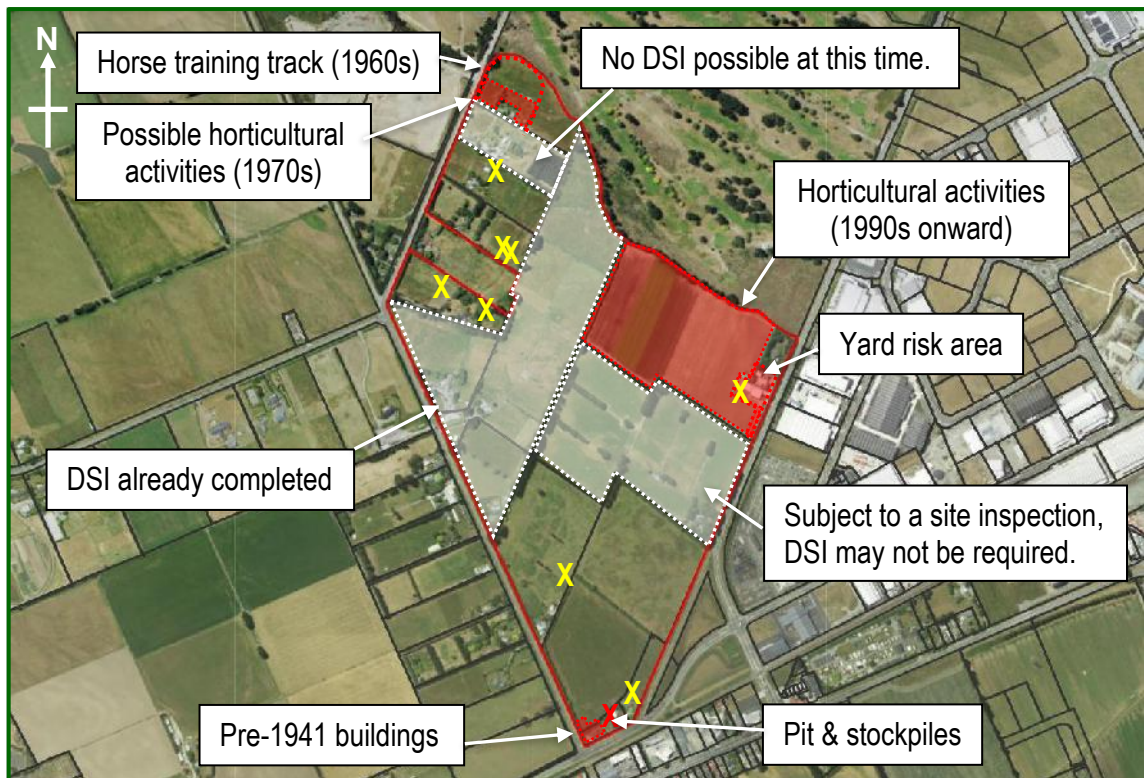


Figure 2 – Additional DSI Investigations Risk Areas Plan (white areas not in current report scope)

9.2 Sampling and Analysis Plan

9.2.1 Sampling Design

For the purpose of sampling design, each identified risk area is to be treated as a single exposure area. The principal receptors are current and future users of the site and workers involved with soil disturbance activities. The sampling strategy for each risk area / mode of contamination is detailed below in **Table 8**. As noted in Section 9.1 above the pit observed on 2 Barbers Road will not be sampled at this time.

Table 8 – Sampling Design Strategy

Contaminants of Concern	<p>1970s potential horticultural activities: Heavy metals and OCP's</p> <p>Horticultural activities from 1990 onward: Heavy metals including boron and ONOPs.</p> <p>Yard area at 173 Pound Rd: Heavy metals, OCPs and total petroleum hydrocarbons (TPH).</p> <p>Pre-1941 buildings: Heavy metals</p> <p>Stockpiles: Primarily heavy metals, other contaminants of concern such as PAH or asbestos may be added if observations indicate risk.</p> <p>Burn areas: primarily heavy metals, PAH may be added if considered appropriate.</p> <p>Horse training track: heavy metals and PAH</p>
Media to be Sampled	Soils
Number of Sample Locations	<p>1970s potential horticultural activities: one sample location per paddock within risk area</p> <p>Horticultural activities from 1990 onward: 16 locations in a grid across horticultural paddocks.</p> <p>Yard area at 173 Pound Rd: judgemental locations in areas where items and/or pesticides have been stored on unsealed ground and the locations of ASTs.</p> <p>Pre-1941 buildings: judgemental locations within accessible soils around existing and former pre-1941 buildings. XRF screening to guide sampling locations and requirements.</p> <p>Stockpiles: XRF screening to guide sampling requirements.</p> <p>Burn areas: XRF screening to guide sampling requirements.</p> <p>Horse training track: 3 sample locations</p>
Depth of Samples	<p>1970s potential horticultural activities: Due to time since potentially contaminating activities, 50-100mm depth is considered appropriate.</p> <p>Horticultural activities from 1990 onward: Due to the mode of contamination and exposure pathway for principal receptors, surface and shallow (250mm) sample depths are considered appropriate.</p> <p>Yard area at 173 Pound Rd: Due to the mode of contamination, surface samples initially are considered appropriate. Additional, deeper samples may be required later to vertically delineate any identified contamination.</p> <p>Pre-1941 buildings: Due to the mode of contamination and exposure pathway for principal receptors, surface and shallow (250mm) sample depths are considered appropriate. Deeper samples may be taking if XRF readings indicate significant contamination is present below 250mm depth.</p> <p>Stockpiles: XRF screening to guide sampling requirements.</p>

	<p>Burn areas: due to the mode of contamination and exposure pathway for principal receptors, surface samples are considered appropriate. Deeper samples may be taken if XRF readings indicate possible deeper significant contamination.</p> <p>Horse training track: Due to time since potentially contaminating activities, 100mm depth is considered appropriate.</p>
Testing Methodology	<p>1970s potential horticultural activities: samples to be analysed individually for heavy metals and for OCPs as a composite sample.</p> <p>Horticultural activities from 1990 onward: surface samples to be analysed individually for heavy metals including boron and ONOPs as composite samples. 250mm depth samples to be held cold for later analysis if surface sample results show contaminants are present.</p> <p>Yard area at 173 Pound Rd: samples from general storage areas to be analysed for heavy metals. Samples from pesticide storage areas to be analysed for heavy metals including boron and ONOPs. Samples from AST locations to be analysed for heavy metals and TPH.</p> <p>Pre-1941 buildings: samples to be analysed for heavy metals</p> <p>Stockpiles: Analysis requirements dependent on observations and XRF screening.</p> <p>Burn areas/ashy soils on stockpile: samples to be analysed for heavy metals. PAH analysis may be added if considered appropriate.</p> <p>Horse training track: samples to be analysed for heavy metals and PAH.</p>
Field Sampling Technique	<p>Samples are to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.</p>
XRF Testing Procedure	<p>XRF screening will be used to guide sampling around pre-1941 buildings and within burn areas. 1-3 XRF tests will be performed at each sample location and depth around buildings. Approximately 3 XRF tests will be performed at each burn area.</p>

9.2.2 Soil Guideline Values

Human health soil contaminant standards for a group of 12 priority contaminants were derived under a set of five land-use scenarios and are legally binding under The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NESC). These standards have been applied where applicable. The regulations describe these as Soil Contaminant Standards. For contaminants other than the 12 priority contaminants, the hierarchy as set out in the Ministry for the Environment Contaminated Land Management Guidelines No 2 has been followed. These are generally described as Soil Guideline Values. For simplicity, this report uses the terminology Soil Guideline Values (SGV) when referring to the appropriate soil contaminant standard or other derived value from the hierarchy. For soil, guideline values are predominantly risk based, in that they are typically derived using designated exposure scenarios that relate to different land uses. For each exposure scenario, selected pathways of exposure are used to derive guideline values. These pathways typically include soil ingestion, inhalation and dermal adsorption. The guideline values for the appropriate land use scenario relate to the most critical pathway.

The land-use scenario applicable for the proposed use of the site and as a proxy for workers involved in disturbing soils activities is 'commercial/industrial outdoor worker'.

The adopted trigger value used to determine need for assessment of ecological receptors (including stormwater disposal areas) also referred to as Ecological Guideline Values (EGVs) is the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (online) – Sediment GV-high (ANZWQ) multiplied by 3.

For comparison of site concentrations against expected background levels the following published concentrations will be used:

- Heavy metal concentrations will be assessed against the expected background levels as published in *Background Concentrations in Canterbury soils*, Tonkin and Taylor, July 2007.
- Organochlorine pesticide concentrations will be assessed against the concentrations published in *Ambient Concentrations of Selected Organochlorine in Soils*, Buckland, Ellis and Salter, 1998
- Polycyclic aromatic hydrocarbon concentrations will be assessed against the concentrations published in *Background concentrations of polycyclic aromatic hydrocarbons in Christchurch Urban Soils*, Tonkin and Taylor, Nov 2007

9.2.3 Quality Assurance and Quality Control

Field quality assurance measures as described in Section 4.3.1 of the “Contaminated Land Management Guidelines No 5: Site Investigation and Analysis of Soils, revised 2021” (CLMG) are to be followed. These include using trained staff, choosing appropriate sample containers, accurate and individual labelling and recording of locations, completing appropriate laboratory chain of custody forms, chilling of samples as appropriate and timely delivery to laboratories. All non-disposable sampling equipment should be decontaminated between samples using Decon 90 and rinsed with tap water. All samples are to be submitted to IANZ accredited laboratories. Quality control to ensure freedom from sample cross-contamination is to be measured by the appropriate use of duplicate and rinsate blank samples.

9.2.4 XRF Quality Assurance Measures

The current NZ XRF use guidelines (Ministry for the Environment. 2024. *Field use of X-ray fluorescence spectroscopy for investigation of contaminated soils*. Wellington) are to guide the use of the XRF for this investigation.

The XRF to be used is an Olympus Vanta M-Series with a 50KV tube. The manufacturer's instructions are to be followed in the use of the device. All users are to be trained and licensed to operate the XRF.

Standard reference materials and a blank are to be tested prior to each day's testing and compared with expected results. Blank readings are to be taken throughout the day's testing as appropriate to ensure there is no contamination of the XRF window.

It is intended that the device be used qualitatively at this site to guide sample collection and analysis.

9.3 Sampling Results

9.3.1 Summary of Works/Field Observations

Soil sampling was undertaken on 07 and 12 May 2025 in general accordance with the sampling strategy outlined above. Sample Location Plans are included in **Appendix E**.

173 Pound Road: Since the PSI investigation, growing of crops appears to have ceased with all paddocks now grassed. The observed soils at surface and 250mm depth were all silty topsoils.

Judgemental sample locations were placed within the yard risk area as follows, one surface sample was taken from each location:

173P-Y1-3: Area of storage of machinery and scrap along boundary. Three samples were submitted for heavy metal analysis.

173P-Y4: Area of storage behind shed, the sample was submitted for heavy metal analysis.

173P-Y5: Area of storage including vehicle batteries on ground behind shed, the sample was submitted for heavy metal analysis.

173P-Y6: AST present with stained soils at dispenser end. The sample was submitted for heavy metal and TPH analysis.

173P-Y7: Within earth floored shed. No storage of chemicals or fuel was observed within the earth floor shed. This is currently storing farm machinery and general farm items. The sample was submitted for heavy metals including boron analysis and ONOP analysis as a composite with 173P-Y8.1.

173P-Y8: location in front of flammable liquids store shed where several containers of “Reglone” a diquat dibromide herbicide are being stored on a pallet. Diquat dibromide is considered persistent in soils, however, Hill Laboratory was not able to analyse samples for this compound. The sample was submitted for heavy metals including boron analysis and ONOP analysis as a composite with sample 173P-Y7.1.

173P-Y9: Location of AST, no visibly stained soils present. The sample was submitted for heavy metal and TPH analysis.

The stockpile with a burn area at the eastern end appears similar to during the PSI site inspection. XRF screening of the burn area and stockpile indicates that arsenic contamination exceeding the ‘commercial/industrial’ SGV is likely present in the visually dirty/ashy soils but the remaining stockpiled material is clean. Sample BP1.1 was a surface sample taken from ashy soils, sample BP1.2 was taken at 150mm where the soils no longer appeared burnt. Samples BP2.1 and BP2.2 were taken at the other end of the stockpile where no burning was apparent. Some rubbish items (baling twine, scrap metal) are present in the surface soils of the stockpile. The majority of the stockpile consists of loamy silt and gravel.



Photo 25 – Burn area at end of stockpile



Photo 26 – Whole stockpile



Photo 27 – Storage along boundary



Photo 28 – Batteries being stored at 173P-Y5



Photo 29 – AST at 173P-Y6



Photo 30 – Storage within earth floor shed

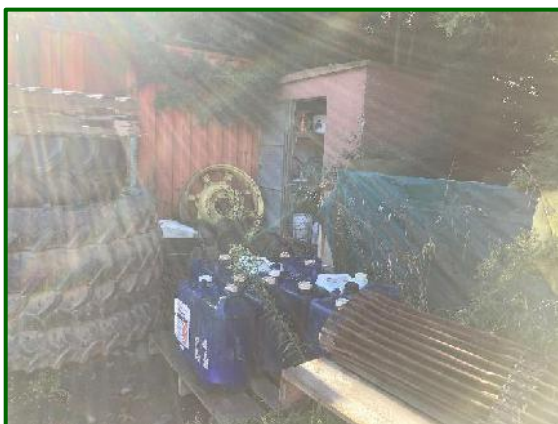


Photo 31 – Reglone containers on a pallet (173P-Y8)



Photo 32 – Ast at 173P-Y9

578 Waterloo Road: XRF testing indicated the burn area was contaminated with arsenic above the 'commercial/industrial' SGV. XRF testing and soil sampling was used to broadly delineate the contaminated burn area. Sample location 578W-SS2 was placed within the burn area to assess the level and depth of contamination. Sample locations 578W-SS1, 578W-SS3 and 578W-SS4 were placed to delineate the burn area.

2 Barters Road: Three sample locations (SS1-3) were placed around the pre-1941 dwelling. Each location was XRF tested and sampled at the surface and 250mm depth. No samples were able to be taken from around the pre-1941 shed/garage due to the hardpacked gravel driveway. Only one sample (SS4.1) was able to be taken near the former pre-1941 sheds along the western boundary due to the dense vegetation and hardpacked gravel driveway.

Excluding the stockpile topped with ash, dark soils, scrap metal and brick fragments, XRF screening of the stockpiles indicated no heavy metal contamination likely to exceed 'commercial/industrial' SGVs was present. It was not considered necessary to take samples from these stockpiles. XRF testing of the ashy/dark soils indicated that arsenic contamination exceeding 'commercial/industrial' SGVs were present. Sample SS5.1 was taken from these soils. While taking the sample it was observed that the dirty soils only extended to approximately 25mm depth. Therefore, the sample likely also included some cleaner soils.

38 Barters & 570 Waterloo Road: The pile of green waste and fence posts (some charred from a previous hedge fire) is still present making it difficult to access the underlying soils. XRF testing found no likely soil contamination, sample 38B-BP1 was taken to confirm the XRF readings.

Disturbance of the soils has occurred in the location of the former pre-1941 shed, possibly due to recent geotechnical investigations. XRF testing of undisturbed soils across this area identified lead concentrations elevated above expected background levels but well below the 'commercial/industrial' SGV. A surface and 250mm depth sample were taken at the XRF location with the highest lead reading.



Photo 33 – Burn area 38B-BP1



Photo 34 – Disturbed soil at former shed location

4, 22 & 30 Hasketts Road: Each burn area identified by the PSI was XRF tested in approximately 3 locations. Surface samples were taken from the location with the highest XRF readings. The samples were submitted for heavy metal analysis.

4 Hasketts Road appeared unchanged from the PSI site inspection. However, this round of XRF testing found arsenic exceeding the 'commercial/industrial' SGV within the western burn area (4H-BP1) and did not find significant contamination within the eastern burn area (4H-BP2). This is the opposite of the XRF screening results during the PSI and indicates very non-homogenous contamination as is often found within burn areas.

Additional dumping of ash, waste items and soil has occurred at 22 Hasketts Road since the PSI site inspection. XRF testing of the new piles of dumped material indicates arsenic contamination exceeding 'commercial/industrial' SGVs is present. A pile of soil and rubbish items covered by a piece of carpet had the appearance of the contents of an excavated pit. White fibres, most likely fibreglass, were observed within the soil. Sample 22H-BP3 was taken from the pile and submitted for heavy metal analysis, sample 22H-ASB1 was submitted for semi-quantitative asbestos analysis and a sample of the white fibres was submitted for asbestos presence analysis as sample 'Bulk 1'. The newly dumped material appears to be on top of pieces of plywood or pallets which may have limited any contamination of the underlying soils.



Photo 35 – Newly dumped ash/rubbish piles



Photo 36 – Dumped soil, ash and rubbish (22H-BP3)

Both the potential burn areas identified on 22 Hasketts Road during the PSI still have large waste piles present making the underlying soils difficult to access. XRF testing of the western burn area (pile includes general waste items and household goods) indicates that arsenic contamination exceeding 'commercial/industrial' SGVs is present. Sample 22H-BP1 was taken to confirm the XRF readings. XRF testing of the eastern burn area (only green waste visible in pile) indicates that no significant contamination is present. Sample 22H-BP2 was taken to confirm the XRF readings.

30 Hasketts Road appears unchanged from the PSI site inspection. XRF testing of the burn area identified by the PSI all showed arsenic concentrations below the 'commercial/industrial' SGV. XRF screening during the PSI found arsenic concentrations exceeding the 'commercial/industrial' SGV. Sample 30H-BP1 was taken at the location with the highest arsenic reading during the DSI to confirm the XRF readings.

48 Hasketts Road: Sample locations SS1-SS3 were placed along the former horse training track. Samples from these locations were submitted for heavy metal and PAH analysis. Three sample locations (SS4, SS5 & SS7) were sampled at 50-100mm depth within paddocks with a possible former horticultural use. Sample location SS6 was placed next to the farm shed and water tank as the most likely location for any mixing of agrichemicals to have occurred. These samples were submitted individually for heavy metal analysis and OCP analysis as a composite sample.

9.3.2 Evaluation of Results

A Table of XRF Results is included in **Appendix G**. Tables of Laboratory Results are included in **Appendix H**. Copies of the Laboratory Reports are included in **Appendix I**.

173 Pound Road: The laboratory results show C10-C14 fraction hydrocarbons exceed the 'commercial/industrial' SGV for surface soils consisting of sandy SILT at sample location 173P-Y6. There were no other exceedances of the 'commercial/industrial' SGVs. However, XRF testing did indicate that small hotspots of arsenic exceeding 'commercial/industrial' SGVs are present within the burn area.

Heavy metals exceed expected background levels in all but two samples taken from within the burn area and yard area. Heavy metals are generally at or below expected background levels across the paddocks. Three cadmium results from the paddocks slightly exceed expected background levels.

The Total Hydrocarbon (C7 – C36) results from samples 173P-Y6.1 and 173P-Y9.1 both exceed the Ecological Guideline value of 1,650mg/kg.

The ONOP analysis detected traces of pendimethalin in two of the composite samples. The results were both 0.8mg/kg. There is no SGV for this compound under the NESCS. The US EPA regional screening level for pendimethalin for land with an industrial use is 250,000mg/kg. Therefore, this concentration of pendimethalin is considered highly unlikely to pose a risk to human health in an industrial use. All other ONOP results were below laboratory limits of detection.

Although not identified as contaminants of concern, the lab analysis suite included OCPs. These results detected traces of 4,4'-DDT and 4,4'-DDD (a breakdown product of DDT) in two composite samples. Expected background levels and SGVs for DDT and its breakdown products are compared against the Total DDT result. The Total DDT results were all below the laboratory limit of detection.

578 Waterloo Road: The laboratory results show arsenic exceeds the 'commercial/industrial' SGV within the burn area. Sample 578W-SS2.1 contains 72mg/kg arsenic compared with the 'commercial/industrial' SGV of 70mg/kg. The depth of contamination extends to nearly 400mm depth at location 578-SS2.

Multiple heavy metals exceed expected background levels within all samples taken from around the burn area on this property.

2 Barbers Road: The laboratory results show no exceedances of the 'commercial/industrial' SGVs. However, XRF testing of the ashy soils on top of one stockpile did indicate that small hotspots of arsenic exceeding the 'commercial/industrial' SGV are likely present.

Lead exceeds the EGV within sample 2B-SS5.1, taken from the ashy soils on top of one stockpile. Multiple heavy metals exceed expected background levels within all samples taken from this property.

PAH analysis of sample 2B-SS5.1 detected traces of multiple PAH compounds. The concentrations are all below accepted background concentrations.

38 Barbers Road & 570 Waterloo Road: The XRF testing and laboratory results show no exceedances of the 'commercial/industrial' SGVs.

Multiple heavy metals exceed expected background levels around the former shed location on the southern corner of 570 Waterloo Road. The results from the burn area (38B-BP1) were all below expected background levels. However, it is noted that the XRF readings taken during the PSI showed arsenic and lead above expected background levels at one location within this burn area.

4, 22 & 30 Hasketts Road: The laboratory results show arsenic exceeds the 'commercial/industrial' SGV of 70mg/kg in three of the five burn areas identified by the PSI and within material recently dumped on 22 Hasketts Road. The latest XRF readings and laboratory result from the eastern burn area on 4 Hasketts Road were below the 'commercial/industrial' SGV. However, XRF testing of this location during the PSI recorded an arsenic concentration of 162mg/kg. Therefore, small hotspots of arsenic exceeding 'commercial/industrial' SGVs are likely present within this burn area.

Zinc exceeds the EGV at burn area 22H-BP1. Arsenic, copper and zinc exceed EGVs within the recently dumped material on 22 Hasketts Road (22H-BP3).

No asbestos was detected in the bulk sample of white fibres. The fibres were shown to be synthetic mineral fibres. No asbestos was detected in the soil sample analysed for semi-quantitative asbestos analysis.

48 Hasketts Road: The laboratory results show no exceedances of the ‘commercial/industrial’ SGVs.

Arsenic and zinc are slightly elevated above expected background levels at location SS6, this is likely due to its proximity to the farm shed. All other heavy metal results were below expected background levels.

Trace concentrations of dieldrin were detected in the composite sample analysed for OCPs. The concentration is well below the ‘commercial/industrial’ SGV. No other OCP compounds were above the laboratory limit of detection.

Trace concentrations of ‘Benzo[b]fluoranthene + Benzo[j]fluoranthene’ were detected in the composite sample analysed for PAH. The result of 0.014mg/kg is well below expected background concentrations.

9.3.3 Results of Field & Laboratory Quality Assurance and Quality Control

The Relative Percentage Differences (RPD) for each duplicate sample pair are shown in Table 9 below. These are within acceptable ranges indicating no quality-control issues.

Table 9 – RPD results for duplicate samples

Sample Pair	RPD
173P-SS1.1 & 173P-DUP1	0-12%
173P-Y4.1 & 173P-DUP2	0-18%
SS1.1 & DUP1 (48 Hasketts Rd)	0-7%
2B-SS3.1 & DUP2	0-14%

All laboratory tested samples were submitted to Hill Laboratories for analysis. Hill Laboratories holds IANZ accreditation. As part of holding accreditation the laboratory follows appropriate testing and quality control procedures. No quality control issues were identified.

9.4 Results of XRF Quality Assurance and Quality Control

The quality assurance measures prescribed above were followed. Calibration checks and blank testing showed no quality control issues.

10 Quantified Risk Assessment

This and previous investigations have identified several small hotspots of contamination that exceed 'commercial/industrial' SGVs associated with burning waste materials on the site:

- Laboratory results from six burn areas located on 578 Waterloo Road, 94 Barbers Road, 4 Hasketts Road, 22 Hasketts Road (two burn areas), and 30 Hasketts Road exceed the 'commercial/industrial' SGVs for arsenic.
- XRF testing of a further three burn areas and some ashy soils on a stockpile located on 173 Pound Road, 2 Barbers Road, 86 Barbers Road and 4 Hasketts Road indicates that some exceedances of the arsenic 'commercial/industrial' SGV are likely present despite the laboratory results being below the SGV.

TPH (C10-C14 fraction) exceeds the 'commercial/industrial' SGV in soils under an AST on 173 Pound Road. TPH exceeds EGVs in soils under both ASTs identified on this property.

Fragments of asbestos containing cement board (ACM) were identified within a bund on 94 Barbers Road. The asbestos in soil results from the bund were all 'Asbestos NOT detected'.

The updated conceptual site models below address the risks associated with the contamination identified at the site:

Table 10 – Updated Conceptual Site Model – Heavy Metals

Conceptual Site Model – Heavy Metals				
Source	Pathways		Receptor	Risk Assessment
<p>Hotspots of arsenic contamination exceeding 'commercial/industrial' SGVs within burn areas and locations with dumped burnt material.</p> <p>Arsenic, copper and zinc exceed EGVs within dumped material on 22 Hasketts Rd. Copper and zinc exceed EGVs within the burn area on 86 Barbers Rd.</p>	Human	Dermal contact, ingestion and inhalation	Site occupiers / land users	Moderate risk in an industrial setting as arsenic exceeds 'commercial/industrial' SGVs, however, each impacted area is relatively small.
			Workers involved in soil disturbance activities at the site	Moderate risk to human health during earthworks as arsenic exceeds 'commercial/industrial' SGVs, however, each impacted area is relatively small.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 14.20 - 18m deep.	Low risk given the depth to groundwater and since heavy metals bind well to soils.
		Surface runoff via overland flow paths	On-site and neighbouring drains.	Low to moderate risk during soil disturbance activities. This risk can be managed through implementing appropriate erosion and sediment control measures.

Table 11 – Updated Conceptual Site Model – TPH

Conceptual Site Model – TPH			
Source	Pathways	Receptor	Risk Assessment
<p>TPH contamination exceeding 'commercial/industrial' SGVs under one AST.</p> <p>TPH exceeding EGVs under both ASTs</p>	Human	Site occupiers / land users	Low to moderate risk in an industrial setting as TPH exceeds 'commercial/industrial' SGVs, however, the impacted area is small.
		Workers involved in soil disturbance activities at the site	Low to moderate risk to human health during earthworks as TPH exceeds 'commercial/industrial' SGVs, however, the impacted area is small.
	Ecological	Infiltration through soils to groundwater	Low risk given the depth to groundwater and the small size of the AST.
		Surface runoff via overland flow paths	Low to moderate risk during soil disturbance activities. This risk can be managed through implementing appropriate erosion and sediment control measures.

Table 12 – Updated Conceptual Site Model – Asbestos

Conceptual Site Model - Asbestos			
Source	Pathways	Receptor	Risk Assessment
<p>An ACM fragment identified in the bund at 94 Barbers Road. No asbestos in soils was identified within the bund. Limited depth of sampling.</p>	Human	Future site occupiers / land users.	Likely low to moderate risk to human health in an industrial setting as the full depth of the bund was not able to be characterised with hand sampling.
		Workers involved in soil disturbance at the site.	Likely low to moderate risk to human health in an industrial setting as the full depth of the bund was not able to be characterised with hand sampling.
	Ecological	Infiltration through soils to groundwater	Low risk to groundwater as asbestos does not transport readily through soils.
		Surface runoff to waterways	Likely low to moderate risk as the full depth of the bund was not able to be characterised with hand sampling.

11 Recommendations

Based on the risk to existing and future site users, it is recommended that the six burn areas/dumped material with contaminants that exceed 'commercial/industrial' SGVs are remediated. It is also recommended that the area of TPH contamination that exceeds 'commercial/industrial' SGVs is remediated. Due to the likely presence of contamination exceeding 'commercial/industrial' SGVs and to assist with future soil disposal during the redevelopment of the site, remediation of three additional burn areas/area of ashy soils is also recommended. The Remediation Action Plan below has been produced to support this recommended remediation. Remediation can occur prior to or in conjunction with redevelopment of the site.

It is recommended that the pit on 2 Barbers Road be managed during redevelopment of the site as per the 'Unexpected Contamination Discovery Protocol' in **Section 14**. If waste materials other than green waste or hardfill (non-ACM) are found when the pit is excavated, further investigation should be undertaken.

It is recommended that site inspections of 111 Pound Road and 40 Hasketts Road be undertaken prior to redevelopment of the site for industrial use. To date no likely HAIL activities have been identified for 111 Pound Road so a DSI may not be required. Likely HAIL activities have been identified for 40 Hasketts Road and a DSI is likely required.

It is recommended that the material in the burn pile at 38 Barbers Road be removed and XRF testing or sampling of the underlying soils be undertaken prior to development of this part of the site to confirm the DSI findings that contaminant concentrations do not exceed 'commercial/industrial' SGVs.

It is recommended that the ACM fence is removed from 64 Barbers Road and disposed of appropriately as per the Health and Safety at Work (Asbestos) Regulations 2016.

One ACM fragment was identified in the bund of soil at 94 Barbers Road. Samples were only able to be taken by hand from the surface 100mm of this pile due to it being very dry and hard at the time of sampling. The presence of further fragments in the bund cannot be ruled out. If the bund is to be removed from site, then it is recommended that further analysis of the bund be completed using a digger to access the deeper soils, in order to determine an appropriate disposal location with confidence. Alternatively, keeping this bund on site and capping it with geofabric and clean soils would address the unknown risk.

Asbestos surveys should be completed on any structures on the site that are to be demolished during redevelopment of the site. Removal of any identified asbestos containing materials (ACM) should be undertaken prior to demolition to avoid contaminating the surrounding and underlying soils with asbestos during demolition.

Areas with contaminant levels above expected background levels have been identified on the site beyond the areas recommended for remediation. Soils from these areas will not qualify for disposal at cleanfill facilities if offsite disposal of soils is required during the development of the site. If offsite disposal of soils is required from areas not yet sampled during the Detailed Site Investigations, then sampling may be required to establish appropriate disposal facilities.

Approximate locations of the recommended remediation areas and areas with other recommended actions are shown on the plan in **Figures 3 & 4** below. Greater detail can be seen on the individual Sample Locations Plans in **Appendix E**.

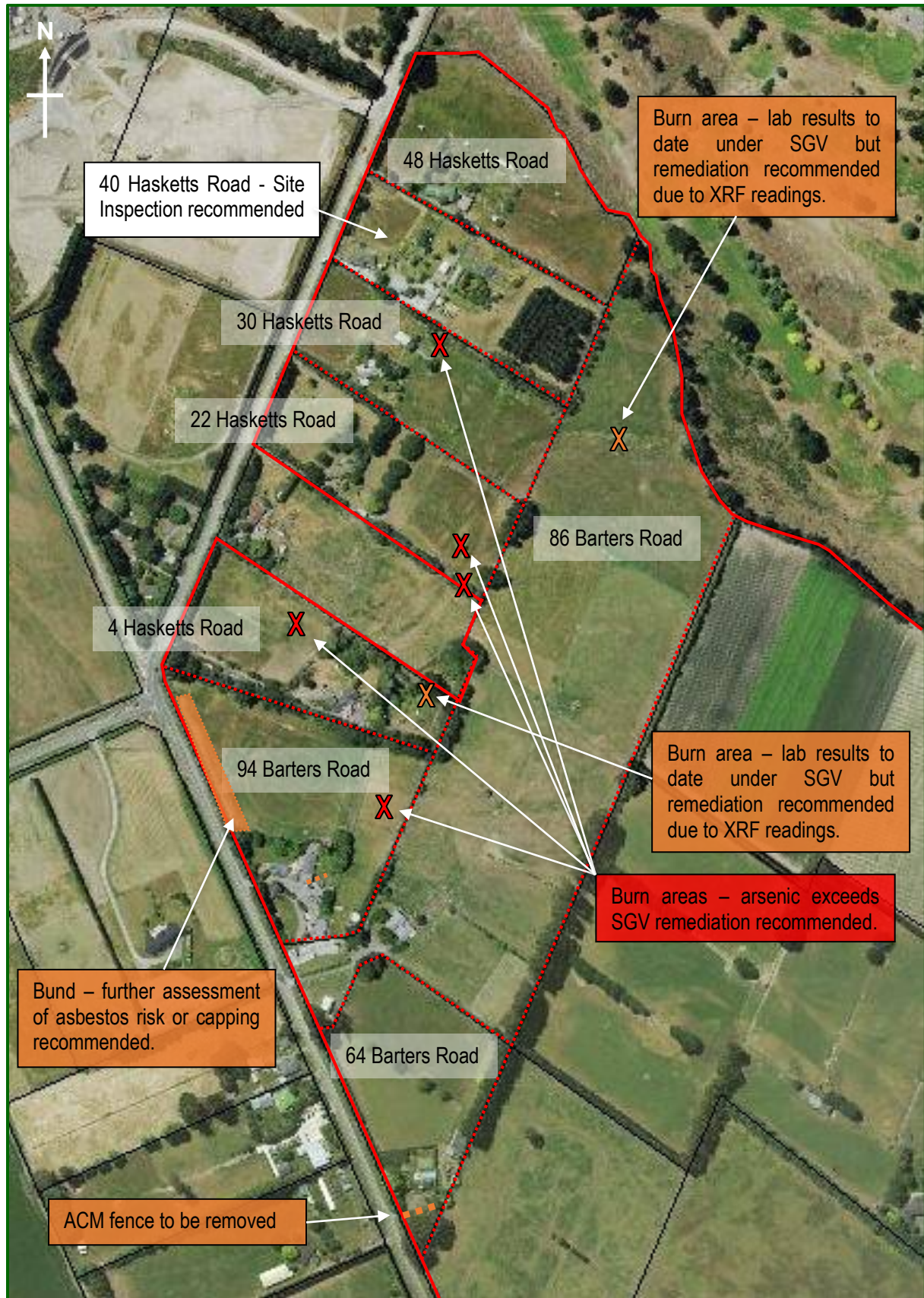


Figure 3 – Remediation & Other Recommendations Plan (4, 22, 30, 40, 48 Hasketts Rd, 86, 64 Barters Rd)

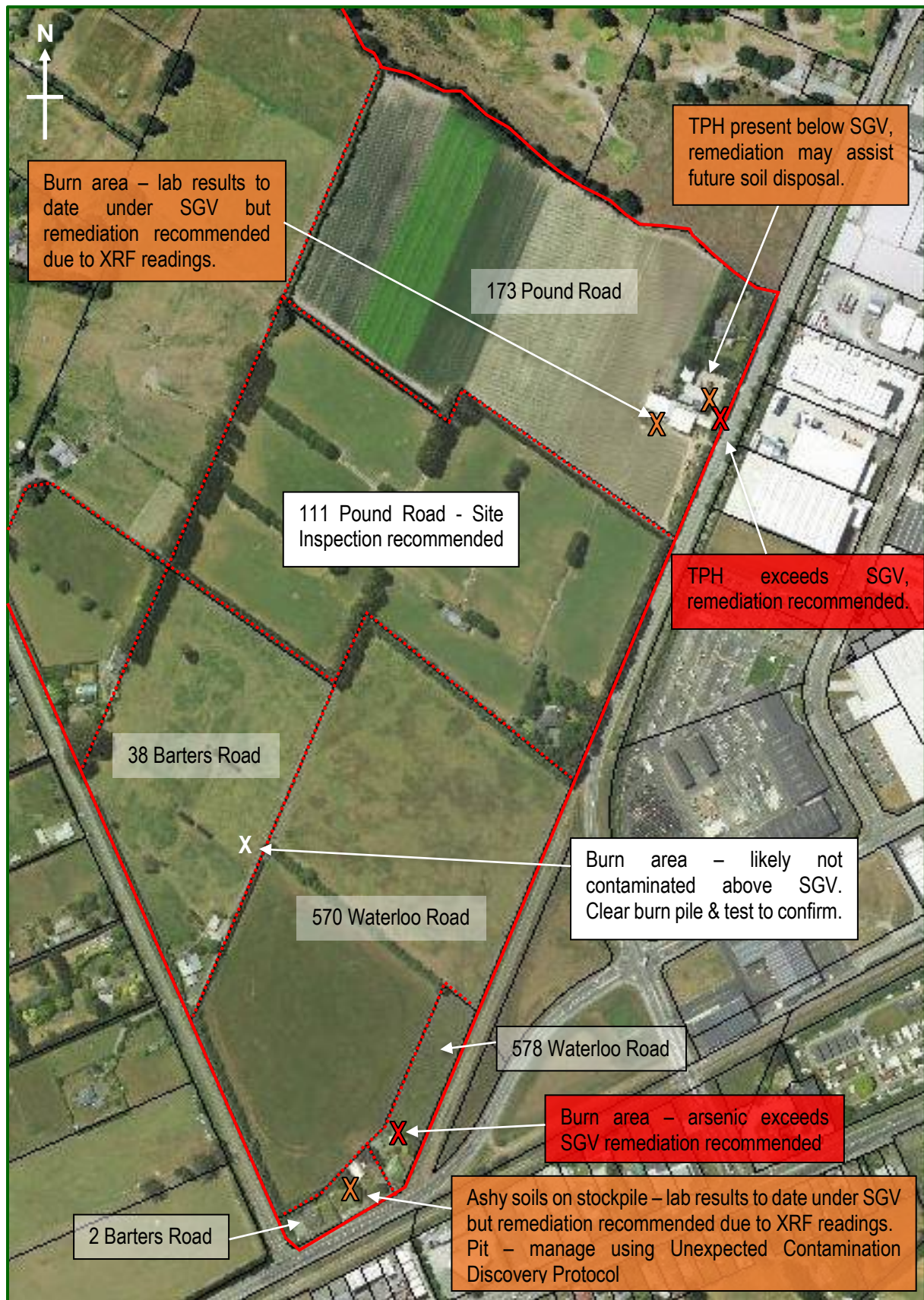


Figure 4 – Remediation & Other Recommendations Plan (173, 111 Pound Rd, 570, 578 Waterloo Rd, 2, 38 Barters Rd)

12 Remediation Action Plan

12.1 Scope of Remediation

This Remediation Action Plan (RAP) has been produced to support the remediation of six burn areas/dumped material and one area of TPH stained soils on the site with contaminant concentrations exceeding 'Commercial/Industrial' SGVs. It is also recommended that this RAP also be used to support the remediation of four additional burn areas/ashy soil area. Although laboratory results to date from these four areas did not exceed 'commercial/industrial' SGVs it is considered highly likely that contamination at this level is present and remediation will assist with future soil disposal during the redevelopment of the site. The locations of the areas recommended for remediation are shown on the Remediation Areas Plan in **Figure 3 & 4** above.

12.2 Remediation Objectives

The remediation objectives are to remove any pathways between the contaminants and the receptors of significance. The significant receptors for this site are existing and future users of the site and construction workers involved in soil disturbance activities. There are multiple ways to achieve this objective including removal of the contaminated material, capping to create a barrier between the contaminated material and the receptor, or by implementing ongoing site management measures to reduce the risk.

Other ancillary objectives include:

- To ensure that appropriate site management measures are in place to protect workers from exposure to contaminants contained in the soils.
- To ensure that soil management controls are in place to prevent tracking of contaminants, dust, stormwater runoff erosion.
- To ensure that any contaminated soils removed off-site are disposed of to an appropriate location.

12.3 Summary of Remedial Options

While multiple options are available, in terms of practicality and consenting requirements, excavation and off-site disposal to an approved facility is the likely preferred methodology. The Remediation Action Plan included in this report has been written to support this method.

Alternative remediation options include capping the contaminated soils or relocating into a managed containment cell on other parts of the subject site, or a combination of measures. If alternative methodologies are to be pursued then an updated Remediation Action Plan will be required, along with consideration of environmental effects and consenting needs.

The following methodology and Site Management Plan should be followed for remediation by excavation of the contaminated soils and off-site disposal.

12.4 Proposed Standard of Remediation

The standard of remediation for the site is to ensure all soils contaminated above 'commercial/industrial' SGVs are removed from the site and disposed of at a facility authorised to receive the material.

It is noted that this standard of remediation does not intend to leave the site as 'clean' which is defined as having all contaminant levels below expected natural background levels. This may

mean that off-site disposal of soils from future development works will not qualify for disposal to cleanfill facilities. If required, the client could choose to remediate to a higher standard.

12.5 Proposed Remediation Methodology

The proposed remediation methodology below is to be planned and carried out as a separate work programme prior to any bulk earthworks or other development related earthworks to avoid any risks of cross-contamination and delays to the main earthworks programme. Prior to beginning any earthworks, a site meeting between the contractor's on-site representative and Momentum Environmental Ltd (MEL) is to take place. This will also allow MEL staff to mark the appropriate areas, particularly as the contaminated areas have only been broadly delineated to date.

The remediation of the site is to occur as follows:

- Set up all site controls and equipment as required and in accordance with the Site Management Plan detailed below in **Section 13**.
- Remove any waste materials stockpiled in the remediation area to enable access to the underlying soils. XRF testing may be carried out to delineate the area requiring excavation.
- Excavate the identified affected areas to approximately 100mm below ground level or until any visually impacted soils are removed.
- Carry out XRF testing to determine the extent of any remaining heavy metal contamination in the soil. Undertaking XRF testing in conjunction with the excavation works will help minimise the volumes requiring disposal while ensuring the remediation objectives are met.
- Continue to excavate any remaining heavy metal contaminated soils in accordance with the objectives set out above.
- Dispose of soils to a suitable disposal location, as per **Section 12.7**
- Following excavation works, the excavated area including walls and base, should be tested by XRF to confirm whether the remediation goal has been achieved. When the XRF results indicate success, laboratory validation sampling should be undertaken.
- If laboratory results indicate further heavy metal contamination is present, further excavations and validation sampling will be required.
- Decontaminate all equipment prior to commencing other site earthworks.

12.6 Remediation Volumes

The following estimated volumes have been provided in good faith to assist in consenting and estimating the extent and cost of works required. The likely affected volumes are based on the current known or expected extent of contamination found and is not to be taken as the final or maximum likely volume. All remediation of contaminated soils has the risk of extending further out or deeper due to hidden areas of contamination.

The contaminated areas have not been delineated. The size of the affected areas has been estimated based on observations during sampling and previous extents shown by historical aerial photographs. The depth of contamination within burn areas is likely limited to the top 100-150mm of soils based on experience with remediation of other contaminated burn areas. The depth of contamination below the ASTs is likely limited to the top 100-200mm of soils.

Table 13 – Estimated In-Situ Remediation Volumes

Property	Size of Remediation Area	Approx. In-situ Volume
173 Pound Rd	TPH above SGV: Size of area with visually stained soil is estimated to be 0.3m ² . TPH below SGV: no visual indicators, rough estimate 0.5m ² . Burn area: approx. 30m ²	0.03-0.06m ³ 0.05-0.1m ³ 3-5m ³
578 Waterloo Rd	Burn area: approx. 70m ² .	0.7-1.1m ³
2 Barters Rd	Ashy soils on stockpile: approx. 1m ² , likely very shallow based on observations. Pit: remediation not currently proposed	0.05-0.1m ³
86 Barters Rd	Burn area: approx. 170m ² .	17-26m ³
94 Barters Rd	Burn area: approx. 20m ² . Bund: Removal currently not proposed (approx. 125m long x 9m wide x 1.5m high)	2-3m ³
4 Hasketts Rd	Burn area 4H-BP1: approx. 20m ² . Burn area 4H-BP2: approx. 20m ² .	2-3m ³ 2-3m ³
22 Hasketts Rd	Burn area 22H-BP1: approx. 40m ² . Dumped material (22H-BP3): combined area approx. 3m ² , piles approx. 100-500m high.	4-6m ³ 1-2m ³
30 Hasketts Rd	Burn area: approx. 20m ² .	2-3m ³
Approx. Total		33-53 m³

12.7 Regulatory Requirements

Soil sampling has shown contamination levels exceed the applicable standards in Regulation 7. Therefore, at the time of writing, the proposed change of use and subdivision will require resource consent from the Christchurch City Council under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations (NESCS).

The remediation excavations will include the activities of soil disturbance and off-site disposal. The permitted volumes are compared with the estimated remediation volumes in **Table 7** below:

Table 14 – Remediation Permitted Activity Assessment

		Indicative soil volume	Complies
Area of the 'piece of land'	603,851m ²		
Permitted soil disturbance volume 25 cubic metres per 500m²	30,193m ³	33-55 m ³	Yes
Permitted removal volume 5 cubic metres per 500m² per year	6,039m ³	33-55 m ³	Yes

Based on the above, the soil disturbance associated with the remediation activities will comply and are classified as a 'permitted activity' under the NESCS.

It is recommended that a planner fully assess all proposed activities associated with the development and remediation against the Land and Water Regional Plan to determine whether consents from ECan are necessary due to the identification of contaminated land.

12.8 Disposal Location

The laboratory results from the recommended remediation areas have been compared with the waste acceptance criteria (WAC) for the main potential disposal locations in Canterbury for the identified contaminants of concern at the time of writing this report. Tables of results compared against landfill WAC are included in **Appendix J**. It is noted that remediation and development of the site may not occur for several years, and the available disposal facilities and their waste acceptance criteria may change.

The current eligibility of the soils from each remediation area to be disposed of at potential disposal facilities is summarised below:

Table 15 – Eligibility of soils for disposal

Contaminated Areas	Possible Disposal Location
Dumped material on 22 Hasketts Road (22H-BP3)	<p>The very high concentrations of heavy metals within the dumped material on 22 Hasketts Rd (22H-BP3) exceed the acceptance criteria of Burwood Landfill and Hororata Managed Fill.</p> <p>Heavy metals by TCLP analysis would be required to confirm suitability of soils to be disposed of at Kate Valley Landfill. If leachability acceptance criteria is exceeded, treatment will be required prior to disposal.</p>
Burn areas on: 94 Barbers Rd 4 Hasketts Rd 22 Hasketts Rd 30 Hasketts Rd	<p>Arsenic concentrations within these burn areas exceed the acceptance criteria for Burwood Landfill and Hororata Managed Fill.</p> <p>Heavy metals by TCLP analysis would be required to confirm suitability of soils to be disposed of at Kate Valley Landfill. If leachability acceptance criteria is exceeded, treatment will be required prior to disposal.</p>
Burn areas on: 173 Pound Rd 578 Waterloo Rd 86 Barbers Rd Ashy soils on stockpile at 2 Barbers Rd	<p>Heavy metal concentrations meet Burwood Landfill and Hororata Managed Fill acceptance criteria.</p> <p>Heavy metals by TCLP analysis would be required to confirm suitability of soils to be disposed of at Kate Valley Landfill.</p>
TPH contamination (173 Pound Rd)	<p>TPH contamination at 173P-Y6.1 exceeds Burwood Landfill and Hororata Managed Fill acceptance criteria.</p> <p>TPH contamination at 173P-Y7.1 meets Burwood Landfill and Hororata Managed Fill acceptance criteria.</p> <p>BTEX and/or PAH analysis is required to determine eligibility for disposal from 173P-Y6.1 and 173P-Y7.1 at Kate Valley Landfill.</p>

In addition to Kate Valley Landfill, Burwood Landfill and Hororata Managed Fill, Canterbury EnviroSolutions Ltd (CESL) have multiple facilities and a soil holding and remediation pad for the testing and storage of contaminated material. CESL are able to blend, treat and retest contaminated soils prior to disposal at an appropriate landfill. Therefore, whether they can accept material is determined on a case-by-case basis. While some contaminant concentrations exceed their published WAC, they may still be able to accept the soils. It is recommended that this DSI is

sent to CESL to determine what soils they can accept from the subject site and at which of their facilities (Temuka or Taiko) and obtain a quote for disposal.

Beyond the areas requiring remediation, the Detailed Site Investigations have identified areas with heavy metals elevated above background levels but below ‘commercial/industrial’ SGVs and a bund with fragments of ACM. Soils from these areas will not qualify for disposal at Cleanfill facilities. It is recommended that consideration of appropriate disposal facilities for any soils requiring off-site disposal during the redevelopment of the site is undertaken once detailed development plans, including cut and fill requirements, are available. This may require additional sampling. A broad outline of the current disposal options are shown on the Disposal Option Plan in **Appendix J**. In addition to the sampled areas with results above expected background levels, the areas around the buildings constructed in the 1970s onwards have also been identified as likely to exceed background levels. While these are unlikely to pose a significant risk of contamination, i.e. are not HAIL activities, previous experience shows that elevated heavy metals, particularly zinc, are highly likely to be present.

12.9 Disposal Documentation

For any off-site disposal, all weighbridge/disposal dockets are to be retained, and a copy provided to the suitably qualified and experienced practitioner (SQEP) to include in the final validation report.

12.10 Site Validation Strategy

Following remediation excavation works, the excavated areas including walls and base, shall be tested by XRF to confirm the extent of any remaining heavy metal contamination or to confirm remediation has been successful. Laboratory sampling will be required to confirm the XRF readings and to validate the TPH remediation. The number and location of validation samples is to be determined by an experienced contaminated land practitioner based on the final lateral and vertical extent of the remediated areas.

Where sampling reveals the goals have not been achieved, further remediation works shall be carried out either by further excavation or by capping the remaining soils as deemed most appropriate.

A Site Validation Report is required to be produced and provided to Christchurch City Council and ECan following successful completion of the remediation.

13 Site Management Plan

13.1 Site Setup

- Appropriate washing/decontamination facilities should be put in place to clean any equipment exposed to contaminated soils.
- A large, consistent and reliable water supply and applicators for dust suppression should be available.
- Remediation should be planned in advance so that it occurs in a staged approach/methodical manner to ensure that vehicles do not track contaminated soils onto clean areas.
- A complete copy of this Remediation Action Plan should be provided to all relevant parties, including the contractor, prior to any works commencing.

13.2 Personal Occupational Safety and Health Measures

The contractors shall prepare a site-specific Health and Safety Plan covering all relevant matters and all workers will be inducted prior to site remediation works beginning.

As a minimum, the following matters will need to be included:

- Appropriate personal protection gear which should include as a minimum, head to toe clothing, the use of gloves for any worker handling soil, dust masks to prevent ingestion of contaminated dust particles, safety footwear, hard hats and hi-vis vests.
- Appropriate hand washing measures to prevent ingestion of contaminated soil particles.
- Truck loading procedures and spill prevention.
- Decontamination measures for all equipment.

13.3 Stormwater and Soil Management

Soil disturbance activities in contaminated areas of the site should not take place during heavy rain or high wind. If rainfall occurs and tracking of wet contaminated soils off the site becomes a risk, work should cease.

In general, stockpiling should be kept to a minimum. Any contaminated soil that is to be stockpiled on the site should be appropriately stabilised to prevent mobilisation of contaminants through wind or rain, as required. This may include covering, compacting, polymer or other measures appropriate to the soil type and conditions.

13.4 Dust Control

Water and operators are to be made available at the site. Water should be used to keep the dust emissions to an acceptable level to protect human health as required.

All vehicles transporting soils will use tarpaulins to prevent dust emissions if required.

14 Unexpected Contamination Discovery Protocols

During any excavation works, including remediation works and during development of the site, if hazardous materials are encountered in significant volumes that pose a threat to the health of workers on site, all works should cease until the hazardous material has been assessed by a SQEP in accordance with MfE guidelines.

Signs that would indicate further assessment is required include visually discoloured soils, olfactory evidence of hydrocarbons or other potential contaminants, oily greasy soils, asbestos containing materials or significant rubbish items.

15 Conclusion

This and previous investigations have identified several areas of contamination on the site:

- Laboratory results show six burn areas located on 578 Waterloo Road, 94 Barbers Road, 4 Hasketts Road, 22 Hasketts Road and 30 Hasketts Road are contaminated with arsenic above the 'commercial/industrial' SGV.
- Dumped material on 22 Hasketts Road contaminated with arsenic above 'commercial/industrial' SGVs.
- XRF testing of a further three burn areas located on 173 Pound Road, 86 Barbers Road and 4 Hasketts Road and some ashy soils on a stockpile on 2 Barbers Road indicates that

some exceedances of the arsenic 'commercial/industrial' SGV are likely present despite the laboratory results being below the SGV.

- TPH (C10-C14 fraction) exceeds the 'commercial/industrial' SGV in soils under an AST on 173 Pound Road. TPH concentrations were below the 'commercial/industrial' SGV under a second AST. TPH exceeds EGVs in soils under both ASTs identified on this property.
- Fragments of asbestos containing cement board (ACM) were identified within a bund on 94 Barbers Road. The asbestos in soil results from the bund were all 'Asbestos NOT detected'.

Based on the risk to existing and future site users, it is recommended that the five burn areas, the area of dumped material and the TPH contaminated area with contaminants that exceed 'commercial/industrial' SGVs are remediated. Due to the likely presence of contamination exceeding 'commercial/industrial' SGVs and to assist with future soil disposal during the redevelopment of the site, remediation of the three additional burn areas and the ashy soils on a stockpile is also recommended. Remediation can occur prior to or in conjunction with redevelopment of the site. While multiple options are available, in terms of practicality and consenting requirements, excavation and off-site disposal to an approved facility is the likely preferred methodology. The Remediation Action Plan included in this report has been written to support this method. A Site Validation Report should be produced and provided to Christchurch City Council and ECan following the successful remediation of the site

In addition to the recommended remediation, the following actions are recommended for the site:

- The pit on 2 Barbers Road should be managed during redevelopment of the site using an 'Unexpected Contamination Discovery Protocol'. If waste materials other than green waste or hardfill (non-ACM) are found when the pit is excavated, further investigation should be undertaken.
- Site inspections of 111 Pound Road and 40 Hasketts Road should be undertaken prior to redevelopment of the site for industrial use. To date no likely HAIL activities have been identified for 111 Pound Road so a DSI may not be required. Likely HAIL activities have been identified for 40 Hasketts Road and a DSI is likely required.
- The material in the burn pile at 38 Barbers Road should be removed and XRF testing or sampling of the underlying soils be undertaken prior to development of this part of the site to confirm the DSI findings that contaminant concentrations do not exceed 'commercial/industrial' SGVs as sampling to date has been limited by the presence of the waste pile.
- The ACM fence should be removed from 64 Barbers Road and disposed of appropriately as per the Health and Safety at Work (Asbestos) Regulations 2016.
- One ACM fragment was identified in the bund of soil at 94 Barbers Road. The presence of further fragments in the bund cannot be ruled out. If the bund is to be removed from site, then it is recommended that further analysis of the bund be completed using a digger to access the deeper soils, in order to determine an appropriate disposal location with confidence. Alternatively, keeping this bund on site and capping it with geofabric and clean soils would address the unknown risk.
- Asbestos surveys should be completed on any structures on the site that are to be demolished during redevelopment of the site. Removal of any identified asbestos containing materials (ACM) should be undertaken prior to demolition to avoid contaminating the surrounding and underlying soils with asbestos during demolition.

Beyond the areas requiring remediation, the Detailed Site Investigations have identified areas with heavy metals elevated above background levels but below 'commercial/industrial' SGVs and a bund with fragments of ACM. Soils from these areas will not qualify for disposal at Cleanfill facilities. It is recommended that consideration of appropriate disposal facilities for any soils requiring off-site disposal during the redevelopment of the site is undertaken once detailed development plans, including cut and fill requirements, are available. This may require additional sampling.

16 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the site, Momentum Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

This report does not attempt to describe all risks or possible outcomes resulting from carrying out remediation works. Any party carrying out remediation works shall be responsible for all such works, including implementing all health and safety precautions as appropriate. Momentum Environmental Limited disclaims all liability whatsoever for any loss or damages, if any, suffered by any party as a result of any remediation works undertaken.

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Appendix A – Previous Site Inspection & Sample Location Plans



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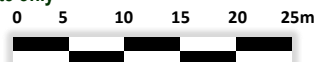
LEGEND

- **SS1A** Soil sample location tested for asbestos semi-quantitative
- **BULK** Bulk fragment tested for presence/absence
- **BULK** Bulk fragment tested positive for asbestos

PLAN MUST BE PRINTED IN COLOUR

• SS42A • **BULK** –
64 Barbers

Graphic scale is approximate only



Date: 29 January 2024

Drawing No: 817/6

64 Barbers Road, Templeton
Sample Location Plan

Notes:


- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



Specialist soil contamination experts,
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LEGEND

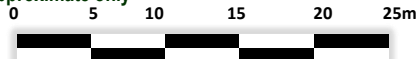
- SS1 Soil sample location
-  Composite sample grouping

PLAN MUST BE PRINTED IN COLOUR



Approx. extent of site shown on plan

Graphic scale is approximate only



Date: 01 February 2024

Drawing No: 817/7

86 Barbers Road, Templeton Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only




Approx. extent of site shown on plan



Specialist soil contamination experts,
keeping your project moving.

www.momentumenviro.co.nz

LEGEND

- SS1 Soil sample location
-  Area recommended for remediation due to heavy metal concentrations

• BP1

PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only



Date: 01 February 2024

Drawing No: 817/8

86 Barters Road, Templeton
Sample Location Plan – Burn Area

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

LEGEND

- SS1 Soil sample location
- Composite sample grouping

PLAN MUST BE PRINTED IN COLOUR



Graphic scale is approximate only



Date: 01 February 2024




Drawing No: 817/9

94 Barbers Road, Templeton Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

LEGEND

- **SS1** Soil sample location
- **SS1A** Soil sample location tested for asbestos semi-quantitative
- **BULK** Bulk fragment tested for presence/absence
- **BULK** Bulk fragment tested positive for asbestos
- ⊙ **SS1** Soil sample location exceeds commercial/industrial SGV for arsenic
-  Approximate extent of area requiring remediation
-  Composite sample groupings
-  Stockpile extent

PLAN MUST BE PRINTED IN COLOUR



Graphic scale is approximate only



Date: 02 February 2024

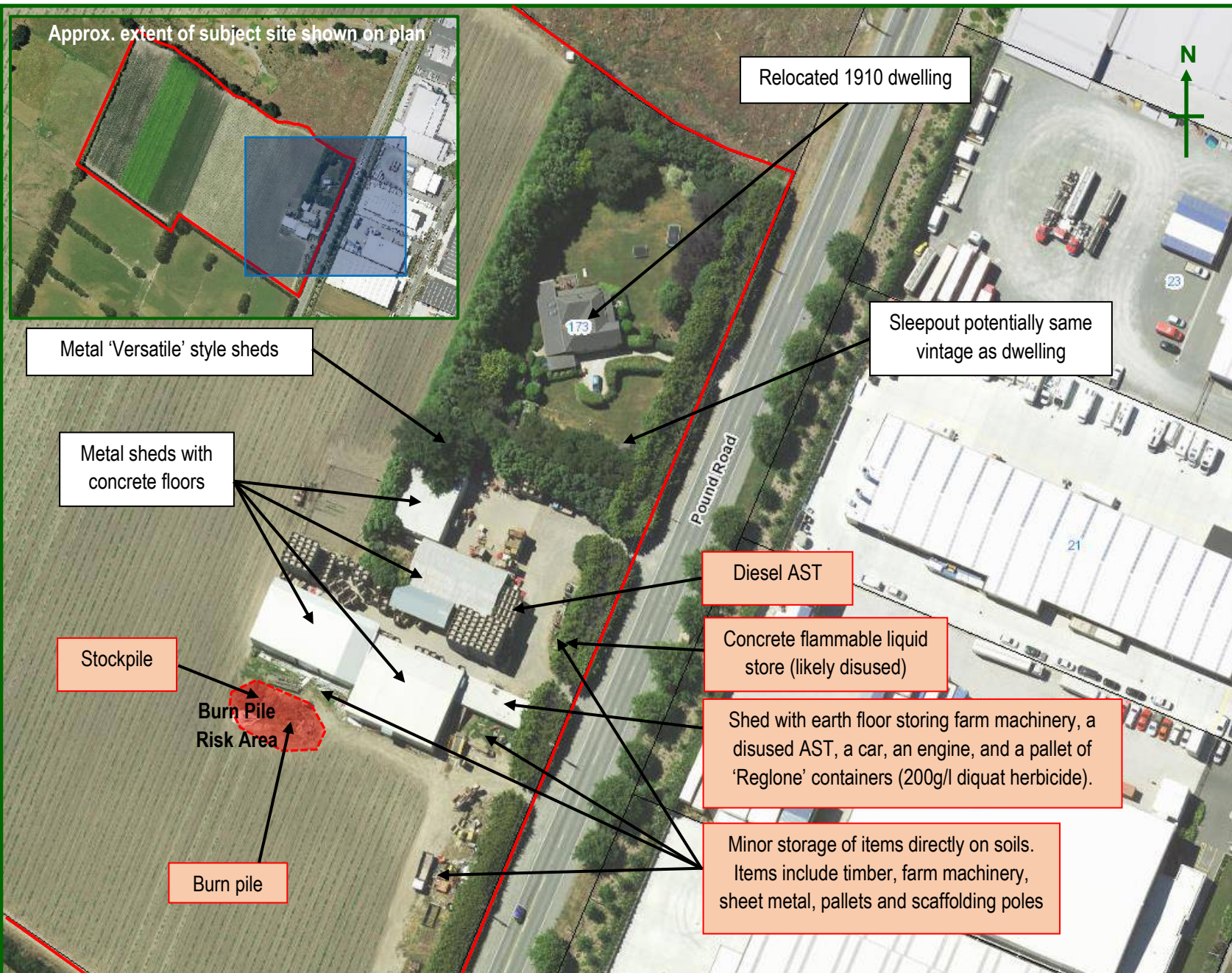
Drawing No: 817/10

94 Barbers Road, Templeton

Sample Location Plan – Burn Area and Stockpile

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



LEGEND

- text Potential HAIL activity / source of contamination
- text Description of structures/areas not considered to pose a risk
- Approx. extent of area considered to be at risk of contamination above 'commercial/industrial' soil guideline values.

Graphic scale is approximate only



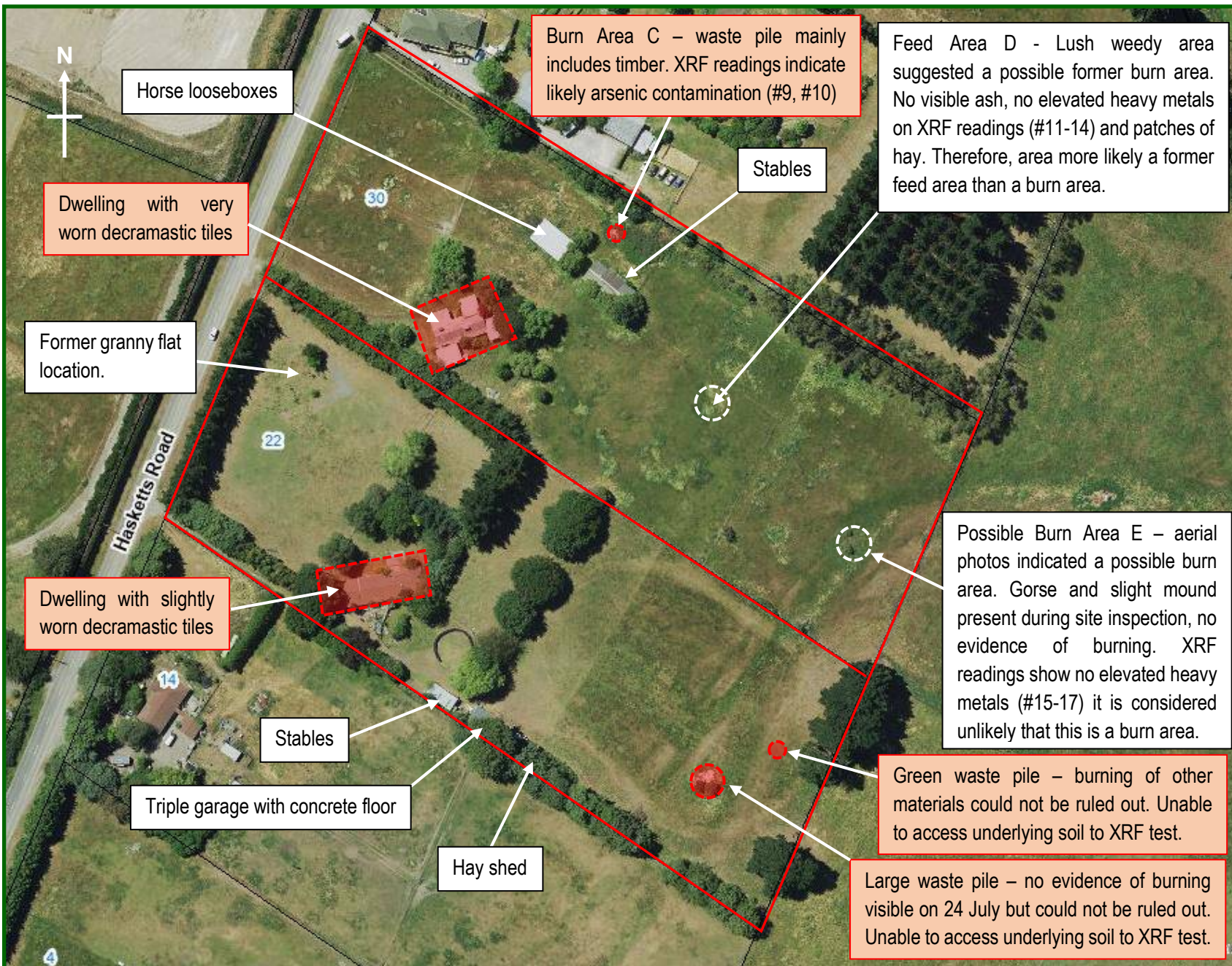
Date: 19 April 2022

Drawing No: 673/1

173 Pound Road, Christchurch Site Inspection Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



LEGEND

- text** Potential HAIL activity / source of contamination
- Approx. extent of risk area**
- text** Description of structures/areas

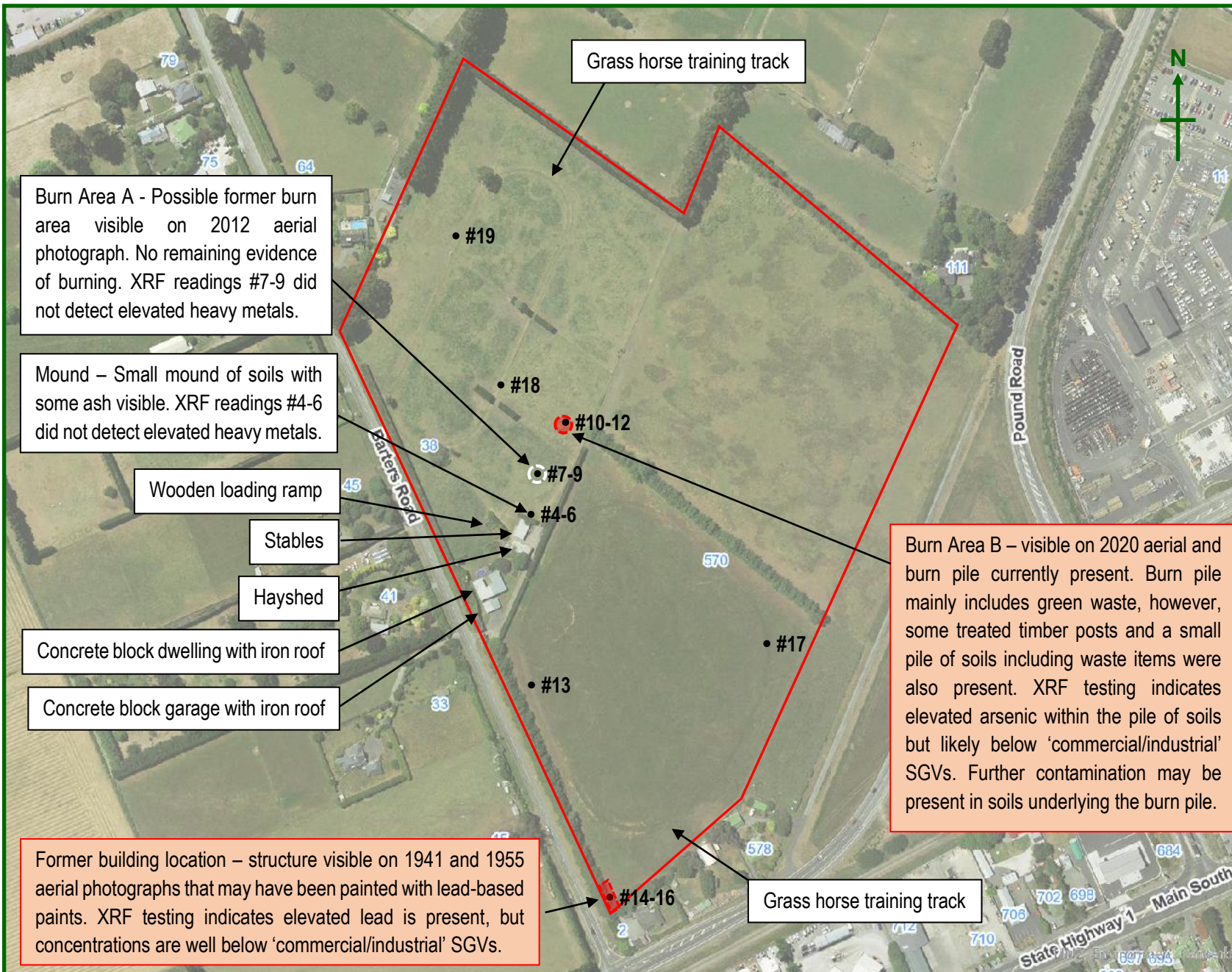
Notes:

- This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- Soil sample locations are approximate only

22 & 30 Hasketts Road, Templeton
Site Inspection and Risk Area Plan

Date: 24 July 2024

Drawing No: 874/2



LEGEND

- text Potential HAIL activity / source of contamination
- Approx. extent of risk area
- text Description of structures/areas
- #1 Approx. location of XRF test with reading number

Graphic scale is approximate only



Date: 28 August 2024

Drawing No: 896/1

38 Barters Road & 570 Waterloo Road, Templeton

Site Inspection and Risk Area Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Appendix B – Historical Certificates of Title

Reference:
Prior C/T. 487/258

Transfer No. 643072
N/C. Order No. -



Land and Deeds 69

No. 4B / 319

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 23rd day of December one thousand nine hundred and sixty-four under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that WILLIAM MAURICE DENTON of Yaldhurst Stud Master

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 47 acres 1 rood 30 perches or thereabouts situated in Blocks IX and XIII of the Christchurch Survey District being part of Rural Section 2773



Thomas
Christchurch Land Registrar

Mortgage 643073 to *Thomas* Deane Charlotte Fraser
and Thomas Deane - 23.12.1964 at
2.23 p.m. **DISCHARGED**
18/6/1965 *Thomas*
A.L.R.

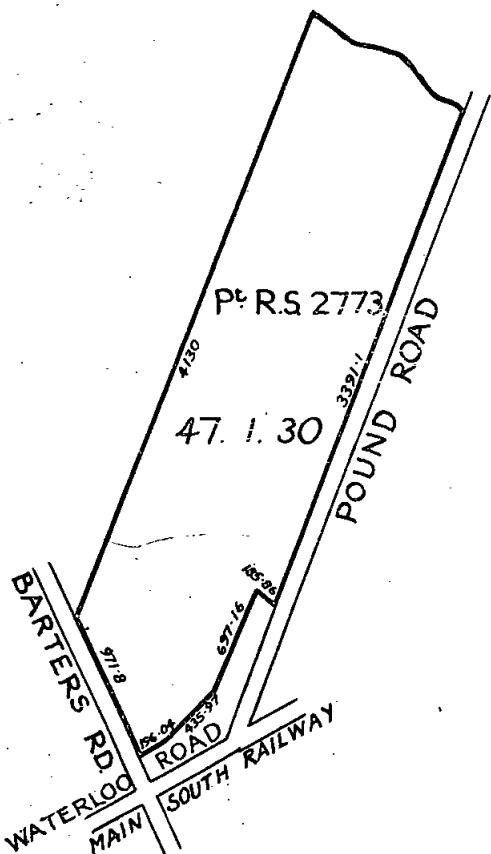
Mortgage 643624 to *Thomas* Leffers and Thomas -
20.1.1965 at 9.20 a.m. **DISCHARGED**
11/10/1965 *Thomas*
A.L.R.

Mortgage 655530 to *Thomas* Christopher Winter -
18.6.1965 at 11.55 a.m. **DISCHARGED**
11/10/1965 *Thomas*
A.L.R.

Mortgage 798423 to *Thomas* The National Bank of
New Zealand Limited - 4/6/1970 at
9.45 a.m. **DISCHARGED**
11/10/1970 *Thomas*
A.L.R.

Variation of
Mortgage 655530 to *Thomas* Christopher Winter -
Variation of Mortgage 655530 - 3.11.1971
at 2.40 p.m. **DISCHARGED**
11/10/1971 *Thomas*
A.L.R.

Mortgage 922519 to *Thomas* South Pacific Merchant
Finance Limited - 8/8/1973 at 10.7 a.m.
PLAN No. 3333 **DISCHARGED**
24.8.73 *Thomas*
A.L.R.



Scale: 1 inch = 10 chains

OVER

15,000/5/63-69498 W

Register copy for L. & D. 69, 71, 72

No. 4B / 319

C.T. 4B/319

Transfer 931406 of Lots 1, 2 and 3 D.P.33334
to N.Z. Refrig. Nominees Limited - 11.10.1973
at 9 a.m.

13A/919 issued for Lot 1 D.P.33334 (herein)

13A/920 issued for Lot 2 D.P.33334 (pt herein)

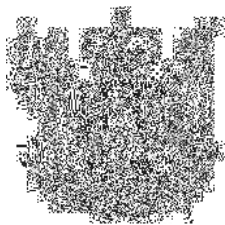
13A/921 issued for Lot 3 D.P.33334 (pt herein)

A.L.R.
A.L.R.

CANCELLED

DUPLICATE DESTROYED





RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB4C/377**
Land Registration District **Canterbury**
Date Issued 08 April 1965

Prior References
CB394/166

Estate Fee Simple
Area 2.4863 hectares more or less
Legal Description Lot 1 Deposited Plan 23834

Original Registered Owners

Megan Jane Chamberlain as to a 1/2 share
Suzanne Jane Gilliland as to a 1/2 share

Interests

5015500.1 Transfer to Maxwell John Doolan and Anne Lorraine Doolan - 15.12.2000 at 11:53 am
5015500.2 Mortgage to The National Bank of New Zealand Limited - 15.12.2000 at 11:53 am
8384722.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981 - 23.12.2009 at 9:00 am
8422901.1 Discharge of Mortgage 5015500.2 - 25.2.2010 at 3:51 pm
8422901.2 Transfer to Christchurch City Council - 25.2.2010 at 3:51 pm
8422901.3 Discharge of Compensation Certificate 8384722.1 - 25.2.2010 at 3:51 pm
Land Covenant (in gross) in favour of Christchurch City Council created by Covenant Instrument 12943298.1 - 22.2.2024 at 2:47 pm

Prior C/P. 394/166

Transfer No.
N/C. Order No. 649816

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 6 acres 0 roods

23 perches or thereabouts being Lot 1 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 656426 to Johannes Theodorus Knalmann of Christchurch Psychiatric Nurse - 29.6.1965 at 3p.m.

A.L.R.

Mortgage 656427 to Emma Boyce Benny and George Willem Haish in shares - 29.6.1965 at 9p.m.

A.L.R.

Transfer 670735 to William Harris of Christchurch Labourer - 13/12/1965 at 12.9 p.m.

A.L.R.

Mortgage 740561 to Canterbury Wine & Spirit Company Limited - 13/12/1965 at 12.5 p.m.

A.L.R.

Transfer 844741 to Graham John Farquhar Herriott of Christchurch Market Gardener and Clio Mary Herriott his wife - 1/10/1971 at 11.56 a.m.

A.L.R.

Mortgage 844742 to Josephine Ann Wood - 1/10/1971 at 11.56 a.m.

A.L.R.

For diagram see back

Scale: 1 inch =

Transfer 844741 to Graham John Farquhar Herriott of Christchurch Market Gardener and Clio Mary Farquhar his wife - Produced 1/10/1971 at 11.56 a.m. and Entered 13/10/1971 at 9.35 a.m.

A.L.R.

Mortgage 844742 to Josephine Ann Wood - Produced 1/10/1971 at 11.56 a.m. and Entered 13/10/1971 at 9.35 a.m.

A.L.R.

No.868735 Evidence that the correct name of one of the Registered Proprietors is Clio Mary Herriott - 29/5/1972 at 12.05 p.m.

A.L.R.

Mortgage 868736 to Alan John Foster Beanland, Murray Thomas Beazley, Ian West Taylor, Bruce Cameron Taylor and Barry Norman Bowater as executors - 20.1.1977 at 11.50 a.m.

A.L.R.

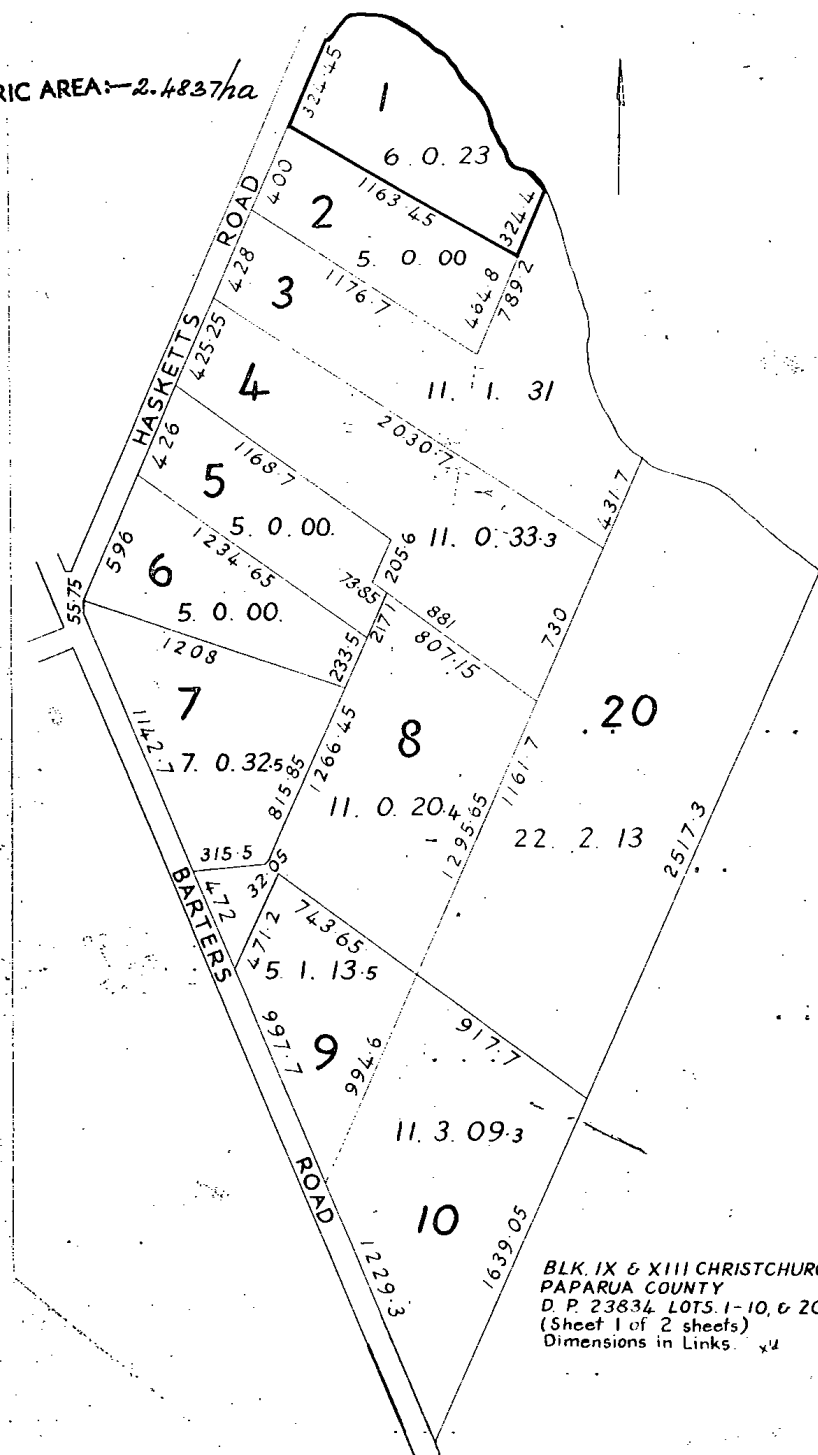
Transmission 112672/1 of Mortgage 868736 to Alan John Foster Beanland, Murray Thomas Beazley, Ian West Taylor, Bruce Cameron Taylor and Barry Norman Bowater as executors - 20.1.1977 at 11.50 a.m.

A.L.R.

30,00/72/61-40310 W

Register copy for L. & D. 69, 71, 72

METRIC AREA:-2.4837ha



BLK. IX & XIII CHRISTCHURCH S.D
PAPARUA COUNTY
D. P. 23834 LOTS 1-10 & 20
(Sheet 1 of 2 sheets)
Dimensions in Links. x4

C.T. 4C/377

Transmission 112672 of Mortgage 868736
to Alan John Foster Beanland, Murray
Thomas Beasley, Ian West Taylor, Bruce
Cameron Taylor and Barry Norman Bowater
as executors - 20.5.1977 at 11.19 am.

John Long
for L.R.

Transfer 147914/1 to Noel Wilfred Borlase
of Christchurch, Real Estate Agent -
15.9.1977 at 1.53 p.m.

DISCHARGED
Mortgage 147914/1 to *Heuguson*
Aldous Solicitors, Nominees Company Limited
- 15.9.1977 at 1.53 p.m.

DISCHARGED
WITHDRAWN
X CAVEAT 692277/1 by REGRET PATRICIA
ORLOWSKI - 15.9.1977 at 11.12a.m.

823320

Mortgage 827405/1 to *Heuguson*
Corporation - 15.9.1977 at 9.33am

A 166739

for A.L.R.

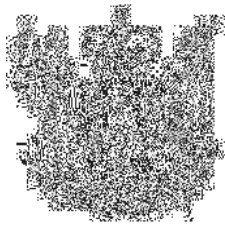
Transmission A266488/1 to Ian Stewart
Cameron, Solicitor and John Allan William
Borlase, Police Officer, both of
Christchurch as Executors - 31.10.1996 at
11.25am

John
for A.L.R.

A387058.1 Transfer to Megan Jane
Chamberlain and Suzanne Jane Gilliland in
equal shares - 22.1.1999 at 11.30

Chamberlain
for DLR





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB4C/378**
Land Registration District **Canterbury**
Date Issued 08 April 1965

Prior References
CB394/166

Estate Fee Simple
Area 2.0234 hectares more or less
Legal Description Lot 2 Deposited Plan 23834
Original Registered Owners
Housing Corporation of New Zealand Limited

Interests

11561731.1 Departmental dealing correcting the name of the registered proprietor from Housing Corporation of New Zealand to Housing New Zealand Corporation - 25.9.2019 at 9:54 am
13188320.2 Transfer to Housing New Zealand Limited - 11.2.2025 at 12:48 pm

reference:
Prior C/T. 394/166

Transfer No.
N/C. Order No. 649316



Land and Deeds 69

REGISTER

4C/378

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 5 acres 0 roods

0.0 perches or thereabouts being Lot 2 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 657976 to Peter Harris of Christchurch Labourer - 15.7.1965 at 12 noon

A.L.R.

Transmission 870998 to Hugh James Ross of Dunedin, Solicitor as Executor - 19/6/1972 at 2.45 p.m.

A.L.R.

Mortgage 675604 to The State Advances Corporation of New Zealand - 28.2.1966 at 12.2p.m.

A.L.R.

Transfer 870999 to Heather Elaina Titterton of Christchurch, Widow - 19/6/1972 at 2.45 p.m.

A.L.R.

Transfer 811258 to Charles Ernest Titterton of Dunedin Farmer - 13/10/1970 at 11.0 a.m.

A.L.R.

Discharge of Mortgage 828117 as to the share of Brian McClelland and George Dean Greenwood - 4/7/1973 at 11.36 a.m.

A.L.R.

Mortgage 828117 to MacKell and Wood MacKay & Co Nominees (Limited) and to Brian McClelland and George Dean Greenwood in Shares - 19/4/1971 at 11.10 a.m.

A.L.R.

Transfer 933351 to Robert Hardie of Christchurch, Chicken Farmer (as to a two-thirds share) and Jean Hardie his wife (as to a one-third share) as tenants in common in the said shares - 25.10.1973 at 2.35 p.m.

A.L.R.

Mortgage 828118 to The McLean Institute - 19/4/1971 at 11.10 a.m.

Mortgage 933352 to The McLean Institute - 25.10.1973 at 2.35 p.m.

A.L.R.

No. 4C/378

For diagram see back Mortgage 943251 to Heather Elaina Titterton Scale: 1 inch = 10 ft

18.10.1972 at 11.45 am.

Mortgage 943251 to Heather Elaina Titterton - 18.4.1974 at 11.45 a.m.

A.L.R.

30.00/12/61-48318 W
Register copy for L & D, 69, 71, 72

Mortgage 3925/1 to Bank of New Zealand - 7.8.1974 at 10.15 a.m.
26/1
A.L.R.

METRIC AREA:—2.0234 ha

Mortgage 118642/2 to General
Foods Corporation (N.Z.)
Limited 14.1.1977 at
1.34 pm

Mortgage 173886/
Bank of New Zealand
21.4.1978 at 1.40 pm.

Variation of Mortgage
933352 - 12.3.1979 at
9.16 am.

Transmission A227008/2 of the
share of Robert Hardie to Robert
John Hardie, Detective Sergeant
and Bryan Robert Watson, Product
Manager, both of Christchurch
as: Executors - 21.3.1996 at
1.37pm

Transfer A227008/3 of the share
acquired by Transmission A227008/2
to Jean Hardie of Christchurch,
Retired - 21.3.1996 at 1:37pm

A392614.1 Transfer to Housing Corporation
of New Zealand Limited - 26.2.1999 at 11.50

**Image Quality due
to Condition
of Original**

BLK. IX & XIII CHRISTCHURCH.S.D
PAPARUA COUNTY
D. P. 23834 LOTS. 1-10, & 20
(Sheet 1 of 2 sheets)
Dimensions in Links. x4

Reference:
Prior C/T. 394/166

Land and Deeds 69

Transfer No.
N/C. Order No. 649816



REGISTER

4C/396

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of April one thousand nine hundred and sixty-five under the seal of the District Land Registrar of the Land Registration District of Canterbury

WITNESSETH that LESLIE GRAY THOMAS of Christchurch Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: AN that parcel of land containing 22 acres 2 roods 13 perches or thereabouts being Lot 20 on Deposited Plan 23834 part of Rural Section 2810



District Land Registrar

Transfer 655529 to William Maurice Denton of Yaldhurst Studmaster - 18.6.1965 at 11.32a.m.

William Maurice Denton
A.L.R.

Transfer 931406 of Lots 2 and 3 D.P.33334 to N.Z. Refrig. Nominees Limited - 11.10.1973 at 9 a.m.

13A/920 issued for Lot 2 D.P.33334 (pt hereon)
13A/921 issued for Lot 3 D.P.33334

Alfred Monaghan
A.L.R.

Mortgage 655530 to Christopher Winter - 18.6.1965 at 11.35a.m.

Christopher Winter
A.L.R.

CANCELLED

DUPLICATE DESTROYED

Mortgage 798423 to The National Bank of New Zealand Limited - 4/6/1970 at 9.45 a.m.

[Signature]
A.L.R.

Variation of Mortgage 655530 - 3.11.1971 at 2.40 p.m. (Mortgagee under Mortgage 798423 consenting).

[Signature]
A.L.R.

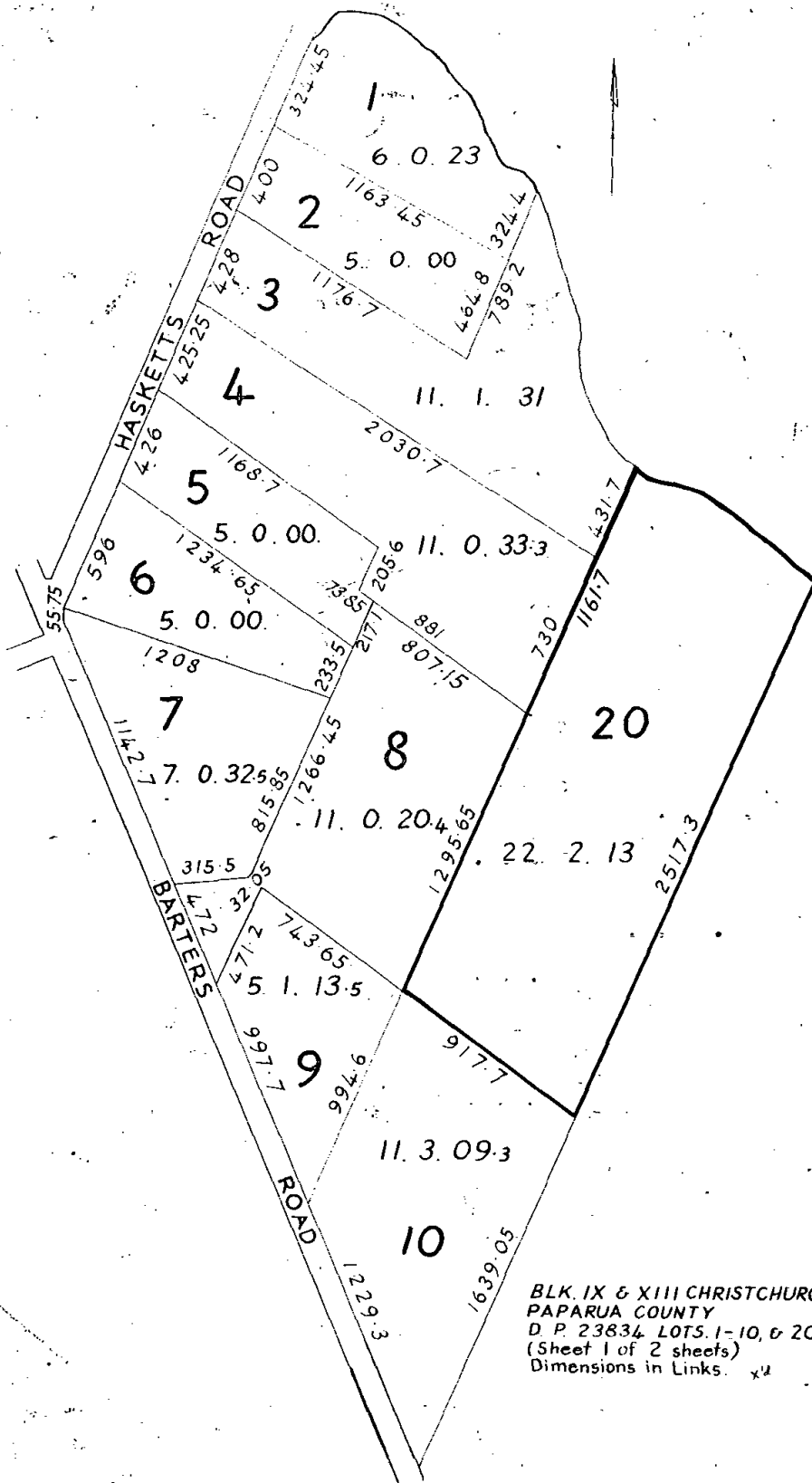
FLAT PLAN No. 33334 DEPOSITED 24.8.73

Mortgage 922519 to South Pacific Finance Merchant Finance Limited - 8/8/1973 at 10.7 a.m.

[Signature]
A.L.R.

For diagram see back
Scale: 1 inch =

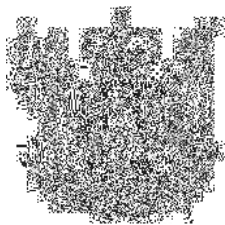
No. 4C/396



BLK. IX & XIII CHRISTCHURCH S.D.
 PAPARUA COUNTY
 D. P. 23834 LOTS. 1-10, & 20
 (Sheet 1 of 2 sheets)
 Dimensions in Links. x4

Image Quality due
 to Condition
 of Original





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB13A/920**

Land Registration District **Canterbury**

Date Issued 11 October 1973

Prior References

CB4B/319 CB4C/396

Estate Fee Simple

Area 10.0000 hectares more or less

Legal Description Lot 2 Deposited Plan 33334

Original Registered Owners

Warwick John Wright and Marianne Johanna Wright

Interests

885937.2 Mortgage to Westpac Banking Corporation - 11.7.1990 at 11.34 am

A444103.1 Variation of Mortgage 885937.2 - 2.2.2000 at 10.55 am

7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage 885937.2 in Westpac New Zealand Limited - 2.11.2006 at 9:00 am

References

Prior C/T 4B/319 4C/396

Transfer No. 931406

N/C. Order No. —

Land and Deeds 69



REGISTER

No 13A/920

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 11th day of October one thousand nine hundred and seventy-three under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that N.Z. REFRIG. NOMINEES LIMITED a Company having its registered office at Christchurch —

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 10.00 hectares or thereabouts situated in Blocks IX and XIII of the Christchurch Survey District, being Lot 2 on Deposited Plan 33334 —



Assistant Land Registrar

Transfer 147125/1 to Waitaki N.Z. Refrigerating Limited at Christchurch - 9.9.1977 at 11.33 a.m.

A. Ferguson
for A.L.R.

No 766301/1 Change of name of the registered proprietor to Waitaki International Limited - 28.9.1988 at 11.04 a.m.

Elma Munn
for A.L.R.

Transfer 766301/4 to Brookstock No. 69 Limited at Dunedin - 28.9.1988 at 11.04 a.m.

Elma Munn
for A.L.R.

No. 790999/1 Change of Name of the registered proprietor to PPCS Islington Limited - 28.2.1989 at 11.03am

B. J. ...
for A.L.R.

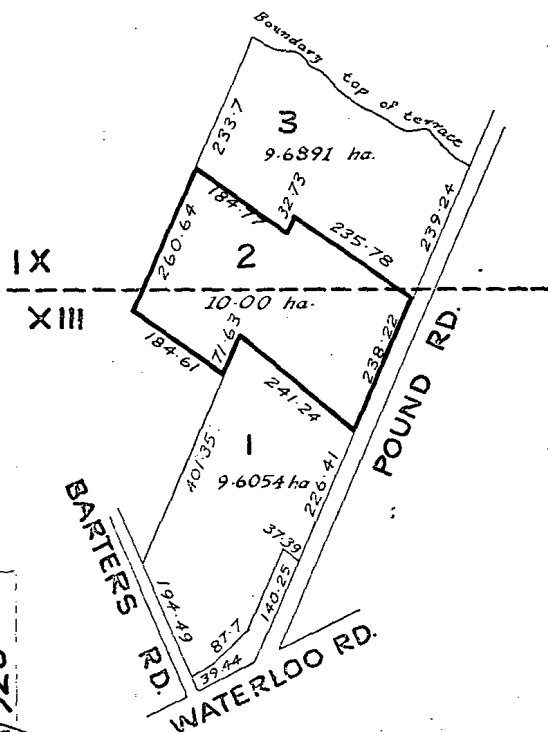
Transfer 810812/1 to Warwick John Wright, Product Manager and Marianne Johanna Wright, Office Manager, both of Christchurch - 19.6.1989 at 11.23am

Mortgage 813053/1 to ... of New Zealand - 29.6.1989 at 11.00am

DISCHARGED
11 JUL 1989

... Munn
for A.L.R.

over.....



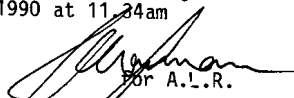
Scale: 1 inch

MEASUREMENTS ARE METRIC


No 13A/920

13A/920

Mortgage 885937/2 to Westpac Banking
Corporation - 11.7.1990 at 11.24am


for A.L.R.

A444103.1 Variation of Mortgage 885937/2
- 2.2.2000 at 10.55


for RGL



202/ 3

NEW ZEALAND.

Form B.



Reference: Vol. 74, folio 200
Transfer No. 57101
Application 9335

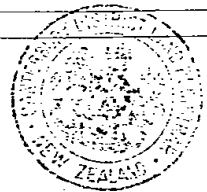
Register-book,
Vol. 202, folio 3
PART CANCELLED.

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

CANCELLED

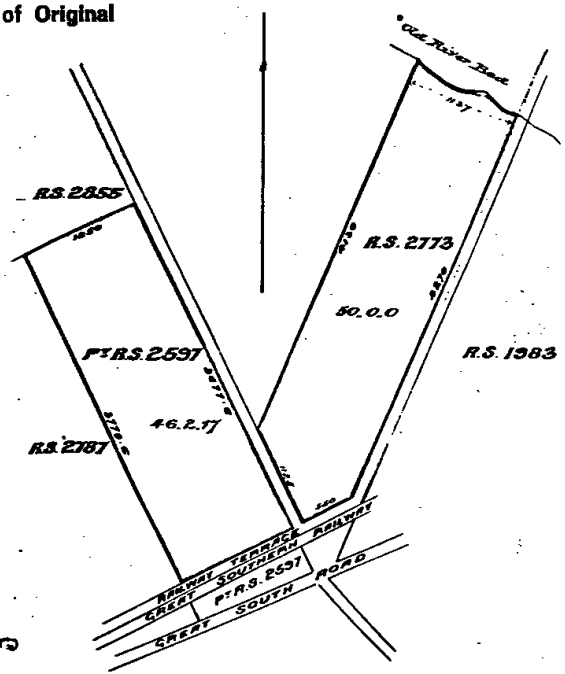
Tenants in common
This Certificate, dated the twenty sixth day of August one thousand nine hundred and five, under
the hand and seal of the District Land Registrar of the Land Registration District of Christchurch Witnesseth that
Edward Jeffs and Charles Thomas Jeffs both of Templeton
farmers or graziers or tenants in common

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or indorsed hereon; subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon, bordered green, be the several admeasurements a little more or less, that is to say: All ^{those} parcels of land containing together twenty six acres broods
and seven feet perches or thereabouts situated in Blocks IX and XIII of the
Christchurch Survey District being Rural section 2773 and part of Rural section
2597



W. H. Smith
District Land Registrar

Image Quality due
to Condition
of Original



Scale, 10 chains to an inch.

Mortgage 49310 produced 26 August 1902 at
2.45 p.m. by Edward Jeffs and Charles Thomas Jeffs
to John James Jeffs part

Mortgage 49311 (Encumbrance) produced 26
August 1902 at 2.45 p.m. by Edward Jeffs and
Charles Thomas Jeffs to Mary Jeffs

Lease 6196 produced 24
March 1906 at 2.56 p.m.
Edward Jeffs and Charles
Thomas Jeffs to The
Christchurch Meat Company
limited of part for 7 years
from 1 April 1906. at 2.10.

Lease 8987 produced 11 May 1905
at 12.5 p.m. by Edward Jeffs and
Charles Thomas Jeffs to The
New Zealand Refrigerating
Company limited for 7 years
from 1 April 1905. at 10.00.

Lease 8988 produced 11
April 1905 at 12.5 p.m. by Edward
Jeffs and Charles Thomas
Jeffs to The New Zealand
Refrigerating Company
limited of part for 7 years
from 1 April 1905. at 10.00.

202/ 3

Lease 10316 produced 21st May 1937 at 10.30 am
Edward Jeffs and Charles Thomas Jeffs to John
Gerald Barker and Harold Selwyn Carter for a
term of 7 years from 1st May 1937 of full
age. *J. H. Green*

Transmission 32775 of the interest of Charles
Thomas Jeffs to Ruth Jeffs married woman
and Charles Edward Reid Jeffs, farmer both
of Templeton entered 16 January 1941 at
12.32 pm. *J. H. Green*

Lease 9795 **Withdrawn** August 1943 p. 10
2.45 pm 31/10/1943 *J. H. Green*

Transfer 255344 produced 31 March 1941
at 12.45 pm. Edward Jeffs, Ruth Jeffs
and Charles Edward Jeffs to John
Gerald Barker and Harold Selwyn
Carter both of Templeton. *J. H. Green*

Transfer 261840 produced 18 April 1945
at 3 pm. Given 24 April 1945 at 3 pm.
John Gerald Barker and Anne 16
Sarah Woodward of last plan 12655
1487/257 *Albano*

PART CANCELLED.

Cancelled and new C.T. issued
Volume 1487 folio 258
(N.C. Order 8199) *Albano*

CERTIFICATE OF TITLE,

Vol. , folio

394/166

Transmission 27513 to John Gerald Carter and Harold Clayton Carter both of 21 Templeton Farmers, dated 12 May 1951 at 2:52 pm.

John Carter
D.R.

349279 Transfer: John Gerald Carter and Harold Clayton Carter to the said John Gerald Carter produced 24 October 1951 at 11:20 am.

John Carter
D.R.

349280 Mortgage: John Gerald Carter and Harold Clayton Carter produced 21/8/1951 at 11:6 am.

DISCHARGE

John Carter
D.R.

Transfer 507111 John Gerald Carter to Norman Dean Thomas of Christchurch Farmers produced 21/8/1959 at 12:6 pm.

Norman Thomas
D.R.

Discharge in error to John Gerald Carter produced 21/8/1959 at 12:6 pm.
Norman Thomas
D.R.

Transfer 527553 Norman Dean Thomas to Leslie Gray Thomas of Christchurch Farmers produced 20/6/1960 at 2:36 pm.

Norman Thomas
D.R.

Mortgage 527556 Leslie Gray Thomas of Norman Dean Thomas produced 20/6/1960 at 2:37 pm.

Norman Thomas
D.R.

Transfer of the terms of mortgage 527556 to Leslie Gray Thomas produced 20/6/1960 at 10:30 am.

Norman Thomas
D.R.

⑤ Mortgage 507112 John Gerald Carter - 21/8/1959 at 12:6 pm.

Norman Thomas
D.R.

Pursuant to Section 35(3) of the Land Registration Act 1961 Part 21 DP 23834 vested in Her Majesty the Queen on 2/4/1965.

Norman Thomas
D.R.

N.C. 647816 cancelled and new C.S. 2/4/1965 41/377 to 386 and 396 issued for Part 1 to 10 of 20 DP 23834.

Norman Thomas
D.R.

Norman Thomas
Duplicate destroyed

PLAN No. 23834 DEPOSITED 2-4-1965

NEW ZEALAND

Form B.

Reference: Vol. 202, Folio 3
Transfer No. 261870
Application No.
Order for N/O No.



Register-book,
Vol. 487, folio 257

Cancelled except road.

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

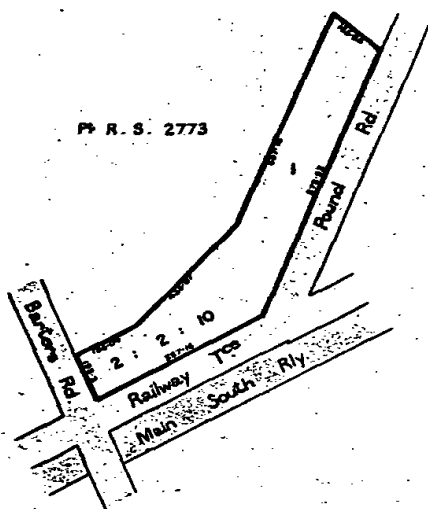
This Certificate, dated the Twenty-seventh day of April, one thousand nine hundred and Forty-five
under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury Witnesseth that
SARAH MORTLAND of Templeton Widow

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon; subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, that is to say: All that parcel of land containing TWO ACRES TWO RODS AND TEN PERCHES or thereabouts situated in Block XIII of the Christchurch Survey District being Lot 1 on plan deposited in the Land Registry Office at Christchurch as No. 12655 part of Rural Section 2773



Plan 20738

Image Quality due
to Condition
of Original.



Scale: 3 chains to an inch.



District Land Registrar.

Transmission 495509 to Mary Ann Mortland of Templeton Spinster as Executrix Entered 9/2/1959 at 2.30 p.m.

Transfer 512693 Dedication of Lot 3 DP 20738 by Mary Ann Mortland as and for a public road produced 17/11/1959 at 12.30 p.m.

Transfer 512694 of Lot 2 DP 20738 Mary Ann Mortland to John Gerald Carter produced 17/11/1959 at 12.30 p.m. (Enclosing document)

Cancelled as to Lot 1 DP 20738 and as 821/98 issued NCO 515095 - 16.12.1959

Cancelled except road



NEW ZEALAND



(Land and Deeds - 4)

Cancelled Form B.

Vol. 202, Folio 3
Transfer No.
Application No.
Order for N/C No. 8199

Register-book,
Vol. 487, folio 258

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the Twenty-seventh day of April, one thousand nine hundred and Forty-five under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury Witnesseth that JOHN GERALD CARTER and HAROLD SELWYN CARTER both of Templeton Farmers

are seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon; subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements a little more or less, that is to say: All ^{those} ~~that~~ parcels of land containing together NINETY-FOUR ACRES AND SEVEN PERCHES or thereabouts situated in Blocks IX and XIII of the Christchurch Survey District being part of Rural Sections 2597 and 2773

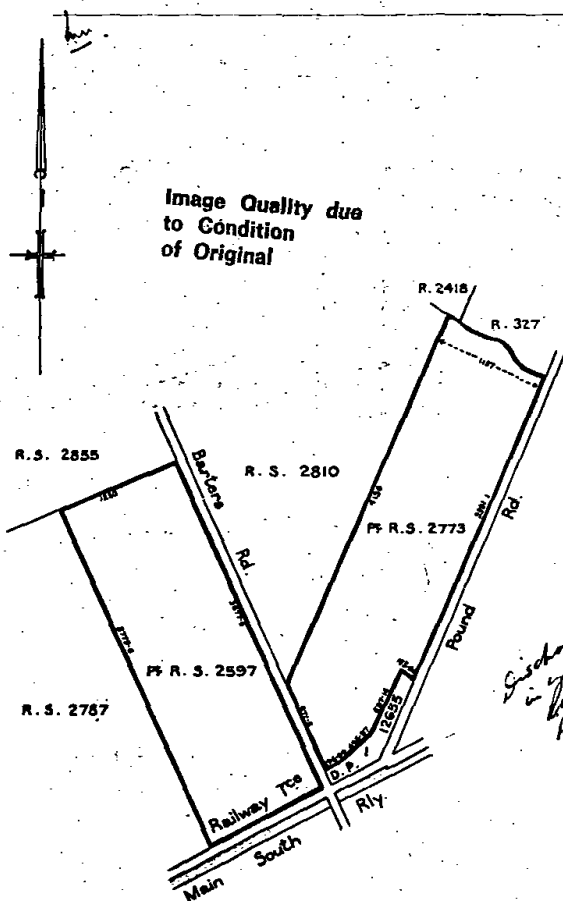


Image Quality due to Condition of Original

Area: 94 0 7

Scale: 10 chains to an inch.



District Land Registrar.

349279 Transfer John Small Bartlett and Harold Selwyn Bartlett to the said John Gerald Bartlett produced 24 October 1951 at 11.2 am

349280 Mortgage John Small Bartlett and Harold Selwyn Bartlett to John Gerald Bartlett produced 21/10/1951 at 11.6 am

Transfer 507111 John Gerald Carter to Norman Dean Thomas of Christchurch Farmer produced 21/9/1959 at 12.6 p.m.

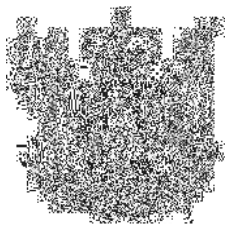
Mortgage 507112 Norman Dean Thomas to John Gerald Carter produced 21/9/1959 at 12.7 p.m.

Transfer 527885 Norman Dean Thomas to Leslie Gray Thomas of Christchurch Farmer produced 22/6/1960 at 2.36 p.m.

Mortgage 527886 Leslie Gray Thomas to Norman Dean Thomas produced 22/6/1960 at 2.37 p.m.

Discharge of the terms of Mortgage 507112 produced 22/6/1960 at 12.36

Transfer 643072 of the part of R.S. 2773 herein to William Maurice Dorton 23/12/1964 at 2.22 p.m.



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **CB818/45**
Land Registration District **Canterbury**
Date Issued 17 November 1959

Prior References
CB487/257

Estate Fee Simple
Area 6475 square metres more or less
Legal Description Lot 2 Deposited Plan 20738

Original Registered Owners
Frank Ridley Hooper and Isobel Kerzia Hooper

Interests

286591.3 Mortgage to Nicholas George Clark and Rex Ralph Armstrong - 7.8.1980 at 9.44 am
286591.4 Settled under the Joint Family Homes Act 1964 - 7.8.1980 at 9.44 am

Land and Deeds-4
FORM No. 2

REGISTER

Reference: Vol. 487, Folio 257
Transfer No. 512694
Order for N/C No.



NEW ZEALAND

Register-book,
Vol. 818, folio 45

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the Seventeenth day of November, one thousand nine hundred and fifty-nine under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury WITNESSETH that JOHN GERALD CARTER of Templeton Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements, a little more or less, that is to say: All that parcel of land containing ONE ACRE TWO RODS SIXTEEN PERCHES or thereabouts situated in Block XIII of the Christchurch Survey District being Lot 2 on Deposited Plan No. 20738 part of Rural Section 2773



[Signature]
District Land Registrar
Assistant

Pencing Covenant contained in Transfer 512694

[Signature] A.L.R.

THIS REPRODUCTION ON A REDUCED SCALE
CERTIFIED TO BE A TRUE COPY OF THE
ORIGINAL REGISTER FOR THE PURPOSES OF
SECTION 215A LAND TRANSFER ACT 1952

[Signature] A.L.R.

Transmission 200782/1 to Nicholas George Clark, Solicitor and Rex Ralph Armstrong, Accountant, both of Christchurch, as Executors - 2-11-1978 at 9.04a.m. *[Signature]* for A.L.R.

Transfer 286591/2 to Frank Ridley Hooper of Templeton, Timber Machinist and Isobel Kerzia Hooper his wife - 7.8.1980 at 9.44 am.

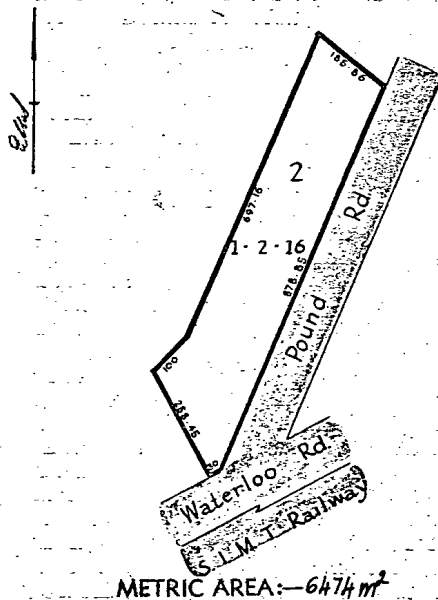
[Signature] for A.L.R.

Mortgage 286591/3 to Nicholas George Clark and Rex Ralph Armstrong - 7.8.1980 at 9.44 am.

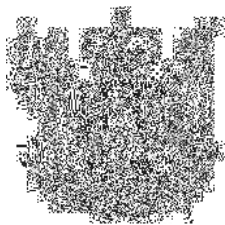
[Signature] for A.L.R.

No. 286591/4 Settled under the Joint Family Homes Act 1964 on Frank Ridley Hooper and Isobel Kerzia Hooper both abovenamed - 7.8.1980 at 9.44 am.

[Signature] for A.L.R.



Scale: 2 chains to an inch



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy**




R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier CB821/98
Land Registration District Canterbury
Date Issued 16 December 1959

Prior References
CB487/257

Estate Fee Simple
Area 3885 square metres more or less
Legal Description Lot 1 Deposited Plan 20738

Original Registered Owners
Barry William Grives and Jan Patricia Grives

Interests

A310597.3 Mortgage to The National Bank of New Zealand Limited - 4.8.1997 at 11.50 am
8355027.1 Discharge of Mortgage A310597.3 - 11.12.2009 at 2:01 pm
8355027.2 Transfer to Stuart Matthew Ward and Vicki Lee Ward - 11.12.2009 at 2:01 pm
8355027.3 Mortgage to Westpac New Zealand Limited - 11.12.2009 at 2:01 pm

Land and Deeds—4
FORM No. 2

REGISTER

Reference:

Vol. 487, Folio 257

Transfer No. 515095

Order for N/C No.



NEW ZEALAND

Register-book,

Vol.
821, folio
98

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the sixteenth day of December, one thousand nine hundred and fifty-nine under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury WITNESSETH that MARY ANN MORTLAND of Templeton, Spinster as Executrix

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered green, be the several admeasurements, a little more or less, that is to say: All that parcel of land containing THREE RODS THIRTY THREE PERCHES AND SIX-TENTHS OF A PERCH or thereabouts situated in Block XIII of the Christchurch Survey District being Lot 1 on Deposited Plan No. 20738 part of Rural Section 2773

[Signature]
District
Assistant Land Registrar.

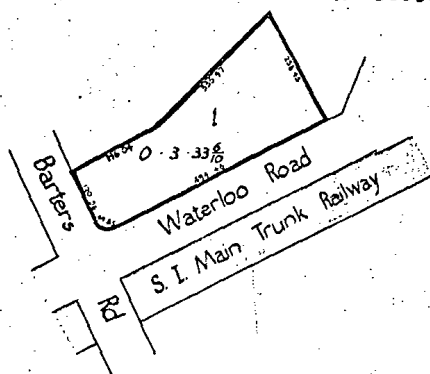
CERTIFIED a true copy of C.T.
except as to colour and scale

Transmission 285170/1 to Bruce Leslie Stanley of Christchurch, Solicitor, Raymond John Campion of Fort Gore, Havelock, Farmer and Melford David Mortland of Templeton, Welder as Executors - 29.7.1980 at 10.23 am.

Transfer 319444/1 to Jurrie Arnoldus Kerkvliet, Butcher and Marie Beverley Kerkvliet his wife, both of Christchurch - 6-4-1981 at 9.23a.m.

Mortgage 319444/2 to ~~Canterbury~~ Savings Bank - 6-4-1981 at 9.23a.m.

- OVER -

METRIC AREA: - 3885m²

Scale: 2 chains to an inch

C.T.821/98

Transmission 374373/2 to Marie Beverley
Kerkvliet of Christchurch, Widow as
Survivor - 26.3.1982 at 9.42 am.

W. Wainman
for A.L.R.

Transfer 374373/3 to Graeme Charles Main
of Christchurch, Branch Manager and Belinda
Margaret Main his wife - 26.3.1982 at
9.42 am.

W. Wainman
for A.L.R.

Mortgage 395015/1 to The Mutual Life and Citizens
Assurance Company Limited - 26.3.1982 at
9.48 a.m.

W. Wainman
for A.L.R.

Mortgage 395015/2 to The Mutual Life and Mortgage Guarantee
Company Limited - 26.3.1982 at 9.48 a.m.

W. Wainman
for A.L.R.

Mortgage 466222/2 to The Mutual Life and Mortgage Nominees
Limited - 8.12.1982 at 9.52 a.m.

W. Wainman
for A.L.R.

Mortgage 896004/3 to The Mutual Life and Banking Group
Limited - 6.9.1982 at 10.34am

W. Wainman
for A.L.R.

Transfer A77459/3 to Graeme Charles Main of
Christchurch, Finance Manager - 21.10.1993
at 11.20am

Mortgage A77459/6 to The Mutual Life and Banking
Corporation - 21.10.1993 at 11.20am

Transfer A93306/2 to Richard Hamish Gerard,
Farmer and Sarah Kathleen Gerard, Shipping
Instructor, both of Christchurch - 26.1.1994
at 11.58am

Mortgage A93306/3 to The National Bank of New
Zealand Limited - 26.1.1994 at 11.58am

W. Wainman
for A.L.R.

A310597.2 Transfer to Barry William Grives
and Jan Patricia Grives

A310597.3 Mortgage to The National Bank of
New Zealand Limited

all 4.8.1997 at 11.50

W. Wainman
for DLR

Appendix C – LLUR Statement



Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear Sir/Madam

Thank you for submitting your property enquiry from our Listed Land Use Register (LLUR). The LLUR holds information about sites that have been used or are currently used for activities which have the potential to cause contamination.

The LLUR statement shows the land parcel(s) you enquired about and provides information regarding any potential LLUR sites within a specified radius.

Please note that if a property is not currently registered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR database is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; additional relevant information may be held in other files (for example consent and enforcement files).

Please contact Environment Canterbury if you wish to discuss the contents of this property statement.

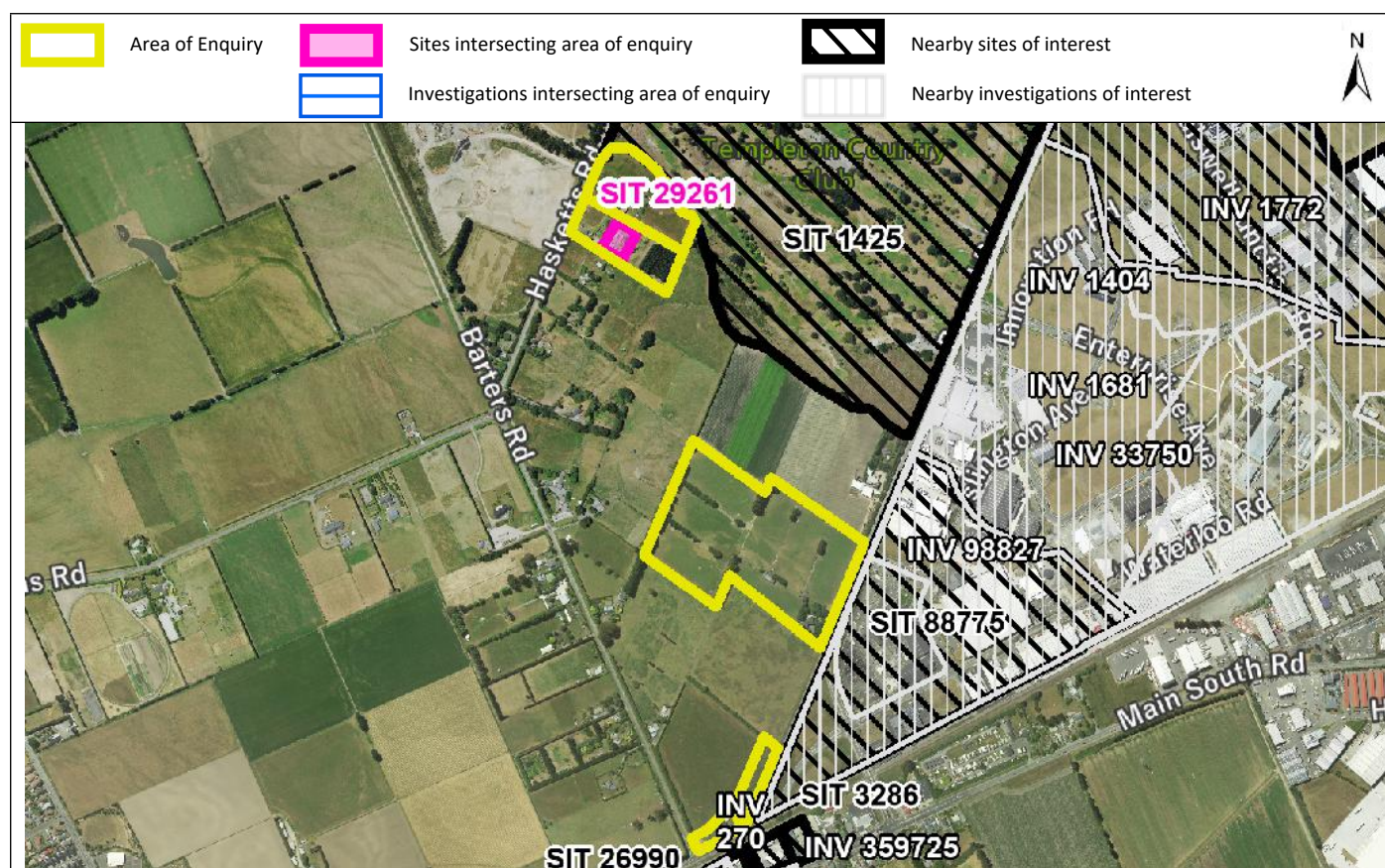
Yours sincerely

Contaminated Sites Team

Property Statement from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ413596

Date generated: 29 April 2025
Land parcels: Lot 2 DP 23834
Lot 1 DP 23834
Lot 2 DP 33334
Lot 2 DP 20738
Lot 1 DP 20738



The information presented in this map is specific to the area within a 100m radius of property you have selected. Information on properties outside the search radius may not be shown on this map, even if the property is visible.

Sites at a glance

 Sites within enquiry area

Site number	Name	Location	HAIL activity(s)	Category
29261	29261	Paparua	A11 - Pest control;	Not Investigated

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry only.

Nearby sites

Site number	Name	Location	HAIL activity(s)	Category
1425	Templeton Country Club	Pound Road, Templeton, Christchurch	A17 - Storage tanks or drums for fuel, chemicals or liquid waste; A10 - Persistent pesticide bulk storage or use;	Not Investigated
1838	Shell Templeton	720 Main South Rd., Templeton, Christchurch	F3 - Engine reconditioning workshops; F7 - Service stations;	Not Investigated

2083	C. B. Norwood	726 Main South Road, Hornby, Christchurch	A17 - Storage tanks or drums for fuel, chemicals or liquid waste; F3 - Engine reconditioning workshops;	Partially Investigated
3286	Drummond and Etheridge Ltd (Christchurch)	712 Main South Road, Christchurch	F4 - Motor vehicle workshops;	Not Investigated
3433	Templeton Panel Beaters	724 Main South Road, Templeton	F4 - Motor vehicle workshops;	Not Investigated
26990	26990	Barbers Road, Templeton	A10 - Persistent pesticide bulk storage or use;	Not Investigated
88775	Effluent Disposal Areas, Former PPCS Islington	Waterloo Road, Islington, Christchurch	G5 - Waste disposal to land;	Below guideline values - Industrial/Commercial

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry within a 100m buffer.

More detail about the sites

Site 1425: Templeton Country Club (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: Pound Road, Templeton, Christchurch
Legal description(s): RES 2418; RES 5094; RS 38609; Lot 1 DP 34947

HAIL activity(s):	Period from	Period to	HAIL activity
	?	1993	Storage tanks or drums for fuel, chemicals or liquid waste
	Pre 1965	2011	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

Notes:

5 Jul 1999 1993: Two underground storage tanks on site, one 2350 L UST 3(a) product, and one 2300 L UST 3(c) product.
Land use = ?-1999: Golf Course

16 Nov 2017 Area defined from: 1965-2011 ECan Aerial Photographs Note: A sport turf golf course was noted on aerial photographs reviewed. 16/10/2013



Investigations:

There are no investigations associated with this site.

Site 1838: Shell Templeton (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: 720 Main South Rd., Templeton, Christchurch
Legal description(s): Lot 7 DP 18445

HAIL activity(s):	Period from	Period to	HAIL activity
	?	present	Engine reconditioning workshops
	?	present	Service stations including retail or commercial refuelling facilities

Notes:

5 Oct 1999 1993 DG Licence: 6 underground storage tanks (USTs);
3 containing class 3a product with a combined capacity of 63,500 L,
1 containing class 3b product with a capacity of 4,500 L, and
2 containing class 3c product with a combined capacity of 49,000 L.

1994 CCC Information: As above. Also "septic tank at west side of house. Soak hole."

18 Aug 2005

Updated info from CCC webmap: 2 x 30000L and 1 x 40000L petrol UST, 1 x 50000L diesel UST, 1 x 7480L flammable liquid AST.

26 Aug 2009

Site holds a current HSNO certificate 105437 for petrol 2x50,000L



Investigations:

There are no investigations associated with this site.

Site 2083: C. B. Norwood (Within 100m of enquiry area.)

Category: Partially Investigated
Definition: Verified HAIL has been partially investigated.

Location: 726 Main South Road, Hornby, Christchurch
Legal description(s): Lot 1 DP 18445; Lot 2 DP 18445; Lot 3 DP 18445

HAIL activity(s):	Period from	Period to	HAIL activity
	?	2001	Storage tanks or drums for fuel, chemicals or liquid waste
	?	2001	Engine reconditioning workshops

Notes:

6 Sep 2001 Tank pull report received 27/08/01 documenting the decommissioning/removal of one underground storage tank (3,375 litre waste oil) and associated soil sampling. See investigation form for details.

2 Dec 2008 The file information held for this site was reviewed 18/02/2008 and an updated LLUR category of partially investigated proposed. The information held indicates that there are no levels of TPHs in the soils at the location of the removed tank above laboratory detection limits. Other potentially contaminating activities on site have not been investigated (e.g. the workshop).



Investigations:

INV 270 **UPSS DECOMMISSIONING AT CB NORWOODS FARM MACHINERY CENTRE**
URS AND BP NEW ZEALAND LIMITED - Detailed Site Investigation
27 Aug 2001

Summary of investigation(s):

In February 2001 one underground storage tank (UST), 3,375 litre capacity, used to contain waste oil, was removed from the site as it no longer used. Ten soil samples were collected from the tank pit excavation walls and pit base and one sample was also collected from fill material. Six of these samples were submitted for total petroleum hydrocarbon (TPH) analysis and all yielded concentrations less than the laboratory level of detection (i.e., < 15 mg/kg). The soil sample results have been compared with the Ministry for the Environment "Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand" (1999). Using the Tier 1 soil acceptance criteria for a commercial/industrial land use in a sandy soil and the criteria for the protection of groundwater criteria all six samples analysed complied with the criteria. The report noted that there was some visual contamination of the soil around the direct fill point, the dispensing lines, under the pumps and around the vents, however, no soil samples were collected from these locations. No assessment has yet been made of other activities undertaken at the site that may have the potential to cause contamination.

Site 3286: Drummond and Etheridge Ltd (Christchurch) (Within 100m of enquiry area.)

Category: Not Investigated
Definition: Verified HAIL has not been investigated.

Location: 712 Main South Road, Christchurch
Legal description(s): Lot 3 DP 1777

HAIL activity(s):	Period from	Period to	HAIL activity
	?	present	Motor vehicle workshops

Notes:

30 May 2007

A motor vehicle workshop. Site visited in February 2007 by Environment Canterbury's Pollution Prevention Officer. New and waste engine oil stored on site. Surface staining observed around the waste oil storage drum.



Investigations:

There are no investigations associated with this site.

Site 3433: Templeton Panel Beaters (Within 100m of enquiry area.)

Category: Not Investigated

Definition: Verified HAIL has not been investigated.

Location: 724 Main South Road, Templeton

Legal description(s): Lot 6 DP 18445

HAIL activity(s):

Period from	Period to	HAIL activity
2000	present	Motor vehicle workshops

Notes:

20 Jul 2007

Panel-beating workshop. Site visited by Environment Canterbury's Pollution Prevention Officer in May 2007.

500L of diesel, 250L of paint and 40L of solvents held on site.



Investigations:

There are no investigations associated with this site.

Site 26990: 26990 (Within 100m of enquiry area.)

Category: Not Investigated

Definition: Verified HAIL has not been investigated.

Location: Barbers Road, Templeton

Legal description(s): Lot 10 DP 1215, Lot 2 DP 1215, Lot 3 DP 1215, Lot 5 DP 1215, Part Lot 1 DP 1215, Part Lot 4 DP 1215, Part Lot 4 DP 1215

HAIL activity(s):

Period from	Period to	HAIL activity
Pre 1965	Pre 1984	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

Notes:

16 Oct 2013

Area defined from: 1965-1984 ECan Aerial Photographs

Note: Market garden plots and a glass house were noted in aerial photographs reviewed.



Investigations:

There are no investigations associated with this site.

Site 29261: 29261 (Intersects enquiry area.)

Category: Not Investigated

Definition: Verified HAIL has not been investigated.

Location: Paparua

Legal description(s): Lot 2 DP 23834

HAIL activity(s):

Period from	Period to	HAIL activity
Pre 1973	Pre 1984	Pest control including the premises of commercial pest control operators

		or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application
--	--	--

Notes:

16 Oct 2013

Area defined from: 1973-1984 ECan Aerial Photographs.

Note: A poultry farm was noted in early aerial photographs an a glass house was noted in later photographs reviewed.



Investigations:

There are no investigations associated with this site.

Site 88775: Effluent Disposal Areas, Former PPCS Islington (Within 100m of enquiry area.)

Category: Below guideline values - Industrial/Commercial

Definition: Investigation results demonstrate that hazardous substances present at the site, but below applicable guidelines. - Industrial/Commercial

Location: Waterloo Road, Islington, Christchurch

Legal description(s): Lot 1 DP 472402, Lot 1 DP 494633, Lot 10 DP 472402, Lot 100 DP 472402, Lot 1000 DP 494633, Lot 1001 DP 503181, Lot 102 DP 472402, Lot 103 DP 472402, Lot 104 DP 472402, Lot 105 DP 472402, Lot 106 DP 472402, Lot 110 DP 479925, Lot 111 DP 472402, Lot 2 DP 472402, Lot 2 DP 494633, Lot 2000 DP 502977, Lot 2000 DP 506584, Lot 22 DP 479925, Lot 23 DP 479925, Lot 24 DP 479925, Lot 25 DP 479925, Lot 26 DP 479925, Lot 27 DP 479925, Lot 28 DP 479925, Lot 3 DP 472402, Lot 3 DP 494633, Lot 39 DP 479925, Lot 4 DP 472402, Lot 4 DP 494633, Lot 40 DP 479925, Lot 41 DP 479925, Lot 42 DP 479925, Lot 43 DP 479925, Lot 44 DP 479925, Lot 45 DP 479925, Lot 46 DP 479925, Lot 48 DP 479925, Lot 49 DP 479925, Lot 5 DP 472402, Lot 5 DP 502752, Lot 50 DP 479925, Lot 501 DP 472402, Lot 502 DP 479925, Lot 51 DP 479925, Lot 52 DP 502977, Lot 53 DP 502977, Lot 6 DP 369835, Lot 6 DP 472402, Lot 6 DP 502752, Lot 601 DP 472402, Lot 601 DP 479925, Lot 602 DP 479925, Lot 65 DP 494206, Lot 67 DP 506584, Lot 7 DP 369835, Lot 7 DP 494633, Lot 8 DP 491326, Lot 9 DP 472402, Lot 95 DP 472402, Lot 99 DP 472402

HAIL activity(s):

Period from	Period to	HAIL activity
1869	1988	Waste disposal to land (excluding where biosolids have been used as soil conditioners)

Notes:

16 Nov 2017

Treated effluent from the oxidation ponds was used to irrigate the fields surrounding the PPCS Islington plant.



Investigations:

INV 33750

Ground Contamination Desk Study - Former PPCS Site - Islington

Tonkin and Taylor Ltd - Preliminary Site Investigation

1 Jun 2005

Summary of investigation(s):

The former PPCS Islington meat processing plant is located on flat pastoral land on the western outskirts of Christchurch at 390 Waterloo Road. The site is bounded by Waterloo Road, Pound Road and Brixton Street. Meat processing has occurred at the site since 1869 with the slaughter and butchering of livestock, rendering and tallow production, fellmongery, and soap, glycerine, glue and gelatine production. The site was redeveloped in 1889, there was a large fire in 1906 and development of the current larger plant began in 1950.

The plant processes have been supported by coal yards, underground and above ground hydrocarbon storage tanks and electrical transformers. Construction and demolition materials from the previous infrastructure redevelopment are known to be buried on site. Asbestos roofing from the plant has reportedly been buried along with domestic and industrial waste on site in a deep landfill at a former quarry. Trench filling, predominantly with animal waste and some domestic waste, has also occurred. Effluent from the plant was passed through four large unlined oxidation ponds before dispersal on surrounding pasture. Shallow uncontrolled filling has occurred in washing and coolant supply lakes, borrow pits and effluent pits around the plant. PPCS Islington closed in 1988. Parts of the plant have been leased to up to 32 commercial tenants whose activities include; solvent bottling, deer processing, demolition timber retailing, yoghurt production and a truck wash, as well as smaller workshops.

In June 2005, Tonkin and Taylor performed a desk study as part of proposed industrial and residential redevelopment of the site to identify and prioritise areas of the site for intrusive investigations. Geological maps, council records and historic aerial photographs were reviewed. A site walkover inspection and interviews of long serving PPCS Islington staff were performed. The processing plant area was recommended for further investigation due to its complexity. Areas of potentially contaminating activities were identified including a large quarry that had been landfilled with industrial and domestic waste to a depth of 6.5 metres, trench disposal areas, shallow fill areas and four large, unlined oxidation ponds to the west of the processing plant that had accepted effluent from the plant and distributed the treated water onto surrounding pastures.

INV 1404 **Contaminated Site Assessment Post Primary Co-operative Society Site Waterloo Road, Islington.**
Resource Consent Application & Assessment of Environment
Glasson Potts Fowler Limited - Detailed Site Investigation
1 Aug 2005

Summary of investigation(s):

In July 2005, Glasson Potts Fowler Limited prepared a Resource Consent Application and Assessment of Environmental Effects for a planned contaminated site investigation to characterise the potential effects of a planned intrusive investigation on odour, dust, noise, traffic, visual amenity and ground stability in support of resource consent application for the investigation of the former PPCS Islington. The purpose of the intrusive investigation was to assess contamination as a result of past hazardous land use activities. Soil contamination, landfill gases and groundwater contamination were planned for investigation. The investigation was to include four trenches, 111 test pits and 166 hand auger cores.

INV 1681 **Contaminated Site Investigation, PPCS Islington Site**
Glasson Potts Fowler Limited - Detailed Site Investigation
19 May 2006

Summary of investigation(s):

Between January and February 2006, Glasson Potts Fowler Limited performed a contaminated site investigation to identify the nature and extent of any ground contamination and landfill gas present and assess the degree or likelihood of groundwater contamination down-gradient of the site.

Site No. 88775 (Effluent Disposal Areas)

Soil samples were collected from 0.00 – 0.75 mm below ground level (bgl) in five grid sampling blocks. Effluent had been applied evenly across these areas and it was thought likely that any contamination would be evenly distributed in surface soil. Each grid sample block was 1 ha and systematically sampled on a 20 x 20 metre grid with 25 sample points composited into five samples from each grid submitted to the laboratory for analysis of a suite of heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc) and organochlorine (OCP), organonitrogen and organophosphorous pesticides (ONOP). Reported nickel concentrations exceeded composite adjusted guideline values for residential land use in each of the sample grids. Reported concentrations of the other heavy metals and pesticides in the effluent disposal areas complied with applicable guideline values for residential use. Analysis of a small number of discrete soil samples indicated that the results from composite sampling are representative of site-wide concentrations and are likely to comply with applicable guideline values.

Site No. 88147 (Oxidation Ponds)

Oxidation pond soil was sampled over a 3 ha band across all four oxidation ponds. 48 soil samples were collected from 0.00 – 0.75 mm depth bgl on a 25 x 25 m grid. Discrete quality assurance samples indicate that composite samples reflect likely soil concentrations of contaminants of concern and also meet residential guidelines. Reported heavy metal and pesticide concentrations from the oxidation ponds did not exceed applicable guideline values for commercial/industrial use.

Site No. 88840 (Disposal Trenches)

Disposal trenches were commonly 3 m deep with a 1 m cap of topsoil and sandy gravel overlying up to 2 m of waste, mostly comprised of animal processing by-products (fat, wool and bones), ash and hardfill (brick, metal, wood and plastic). The sandy gravel below the waste fill was often stained black with leachate. The disposal trench area was sampled on a systematic grid covering 4.8 ha with 75 test pits. 107 samples were collected, with at least one sample collected from each excavated pit at the most obviously contaminated strata. All samples were analysed for a suite of heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc) and total petroleum hydrocarbons (TPH). Representative selections of samples were also analysed for toxic characteristic leaching procedure (TCLP), organochlorine/organonitrate pesticides (OCP, ONOP), volatile organic compounds (VOC), acidic herbicides, volatile fatty acids, acid soluble sulphide, total organic carbon and total nitrogen.

Reported lead concentrations in three samples exceeded the then applicable DEFRA and EA 2002 guideline value for commercial / industrial land use. However, these samples comply with current National Environment Standards (MfE, 2011) for lead in an industrial/commercial land use scenario. Reported C7 – C9 and C10 – C14 speciated total petroleum hydrocarbon concentrations in 12 samples exceeded applicable guideline values (MfE, 1999/2011) for total petroleum hydrocarbons. These concentrations are likely associated with high fat content rather than petroleum. Volatile Organic Compounds (VOC) potentially exceeded the guidelines for 1,2-dibromomethane and 1,2,3-trichloropropane however the laboratory limit of detection was higher than the applicable guideline. No other VOC were detected therefore it is unlikely that these specific compounds exceeded applicable guidelines. No other analysed constituents exceeded applicable guideline values for commercial / industrial land use. No asbestos containing material was identified.

Site No. 88917 (Shallow Fill Area)

Six exploratory test pits were excavated in areas of potential shallow fill where evidence of ground disturbance was observed in aerial photographs. A soil sample was collected where fill material was found (SF004) and analysed for a suite of heavy metals and pesticides, all results complied with guidelines.

Groundwater was sampled from the upper aquifer, both up-gradient and down-gradient of the main landfill areas. One bore at the Templeton Golf Course (M35/1049) was sampled up-gradient and groundwater samples were collected at two bores installed on site at the Waterloo Road boundary (M36/11046 and M35/11047). The Templeton Golf Club groundwater sample was collected from a tap at the clubhouse. The two monitoring bores on site were sampled directly after purging. Groundwater sampling occurred on four occasions over a three week period (06/01/06 to 07/02/06). Groundwater samples were analysed for general water chemistry, E. coli bacteria, heavy metals, hydrocarbons, SVOCs and VOCs. There was no significant difference in quality between up-gradient and down-gradient shallow groundwater (19-35 m bgl). pH results did not comply with New Zealand Drinking Water Standards (NZDWS) on more than one occasion at all bores. Turbidity did not comply with NZDWS from the down gradient bores but is likely to be a function of the different sampling method between the up-gradient golf course (from a tap) and the down-gradient bores (portable electric pump). Reported concentrations of all heavy metals, VOC and SVOC complied with NZDWS.

INV 1772 **Islington Park - Additional Soil Sampling of Effluent Disposal Areas**
Glasson Potts Fowler Limited - Detailed Site Investigation
7 Sep 2006

Summary of investigation(s):

In August 2006, Glasson Potts Fowler performed additional investigation of the pasture areas of the former PPCS Islington meatworks where effluent disposal occurred (Site No. 88775) to confirm that composite samples collected in INV 1681 were representative of soil quality on that portion of the site. Thirty-four soil samples were collected on a 150 m x 150 m grid pattern between 0.0 and 7.5 cm below ground level and analysed for the presence of arsenic and nickel. No reported concentrations of arsenic or nickel exceeded relevant guideline values, which was consistent with the findings of the previous investigation (INV 1681).

INV 98827 **Ground Contamination Assessment - Lots 2 and 3, Waterloo Business Park**
Tonkin and Taylor Ltd - Detailed Site Investigation
19 Feb 2014

Summary of investigation(s):

In January 2014, Tonkin & Taylor undertook a Ground Contamination Assessment at Lots 2 and 3 DP 47402 at the Waterloo Business Park. The land was historically associated with the irrigation of oxidation pond effluent on to ground. The purpose of the Tonkin & Taylor investigation was to determine whether or not this historical activity resulted in contamination remaining in-situ at levels which would negatively affect human health or the environment.

Ten locations were subjected to soil sampling. The majority of samples were collected between 0-75 mm and three from 100-200 mm below ground level. Heavy metals (arsenic, cadmium, chromium, copper, lead and zinc) and pesticides (DDT and dieldrin) were tested.

The investigation was adequate in terms of soil sampling frequency and distribution. There is no indication that contamination could be present at deeper intervals in the soil subsurface. Heavy metals results were all below background. Dieldrin was below the limit the lab could detect in all samples. Minute concentrations of DDT was detected.

The category which is appropriate for the investigation footprint is "Below guidelines (for all land use scenarios)" valid in New Zealand as of June 2015.



Nearby investigations of interest

INV 359725 **Speed Infrastructure Programme SH1 Templeton to Ashburton Detailed Site Investigation**
Aurecon - Detailed Site Investigation
22 Jun 2023

Summary of investigation(s):

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Listed Land Use Register

What you need to know



Everything is connected

What is the Listed Land Use Register (LLUR)?

The LLUR is a database that Environment Canterbury uses to manage information about land that is, or has been, associated with the use, storage or disposal of hazardous substances.

Why do we need the LLUR?

Some activities and industries are hazardous and can potentially contaminate land or water. We need the LLUR to help us manage information about land which could pose a risk to your health and the environment because of its current or former land use.

Section 30 of the Resource Management Act (RMA, 1991) requires Environment Canterbury to investigate, identify and monitor contaminated land. To do this we follow national guidelines and use the LLUR to help us manage the information.

The information we collect also helps your local district or city council to fulfil its functions under the RMA. One of these is implementing the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil, which came into effect on 1 January 2012.

For information on the NES, contact your city or district council.

How does Environment Canterbury identify sites to be included on the LLUR?

We identify sites to be included on the LLUR based on a list of land uses produced by the Ministry for the Environment (MfE). This is called the Hazardous Activities and Industries List (HAIL)¹. The HAIL has 53 different activities, and includes land uses such as fuel storage sites, orchards, timber treatment yards, landfills, sheep dips and any other activities where hazardous substances could cause land and water contamination.

We have two main ways of identifying HAIL sites:

- We are actively identifying sites in each district using historic records and aerial photographs. This project started in 2008 and is ongoing.
- We also receive information from other sources, such as environmental site investigation reports submitted to us as a requirement of the Regional Plan, and in resource consent applications.

¹ The Hazardous Activities and Industries List (HAIL) can be downloaded from MfE's website www.mfe.govt.nz, keyword search HAIL

How does Environment Canterbury classify sites on the LLUR?

Where we have identified a HAIL land use, we review all the available information, which may include investigation reports if we have them. We then assign the site a category on the LLUR. The category is intended to best describe what we know about the land use and potential contamination at the site and is signed off by a senior staff member.

Please refer to the Site Categories and Definitions factsheet for further information.

What does Environment Canterbury do with the information on the LLUR?

The LLUR is available online at www.llur.ecan.govt.nz. We mainly receive enquiries from potential property buyers and environmental consultants or engineers working on sites. An inquirer would typically receive a summary of any information we hold, including the category assigned to the site and a list of any investigation reports.

We may also use the information to prioritise sites for further investigation, remediation and management, to aid with planning, and to help assess resource consent applications. These are some of our other responsibilities under the RMA.

If you are conducting an environmental investigation or removing an underground storage tank at your property, you will need to comply with the rules in the Regional Plan and send us a copy of the report. This means we can keep our records accurate and up-to-date, and we can assign your property an appropriate category on the LLUR. To find out more, visit www.ecan.govt.nz/HAIL.



My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.



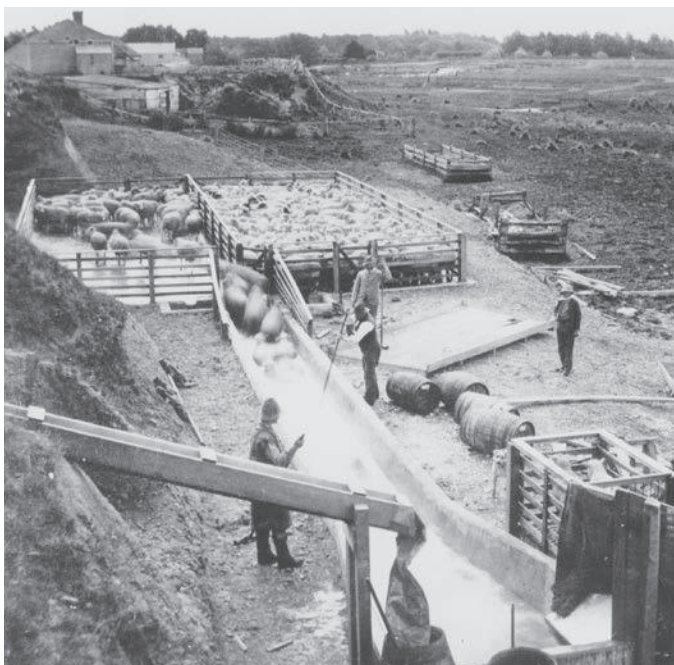
I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

IMPORTANT!

The LLUR is an online database which we are continually updating. A property may not currently be registered on the LLUR, but this does not necessarily mean that it hasn't had a HAIL use in the past.



Sheep dipping (ABOVE) and gas works (TOP) are among the former land uses that have been identified as potentially hazardous. (Photo above by Wheeler & Son in 1987, courtesy of Canterbury Museum.)

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:

Calling from Christchurch: (03) 353 9007

Calling from any other area: 0800 EC INFO (32 4636)



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www.ecan.govt.nz

E13/101

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment Canterbury for further information:

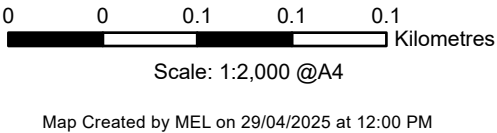
(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz

Appendix D – Historical Aerial Photographs

40 & 48 Hasketts Rd - 1941 Aerial

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40 & 48 Hasketts Rd - 1962 Aerial

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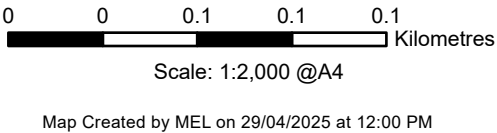
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40 & 48 Hasketts Rd - 1974 Aerial

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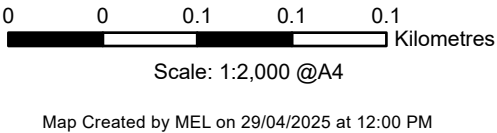
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40 & 48 Hasketts Rd - 1984 Aerial

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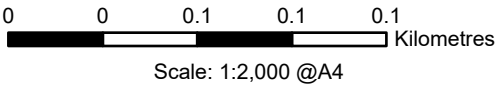
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40 & 48 Hasketts Rd - 1994 Aerial

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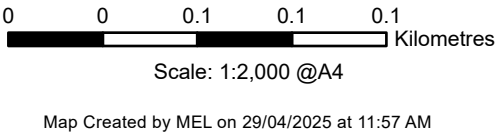
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40 & 48 Hasketts Rd - 2000 Aerial

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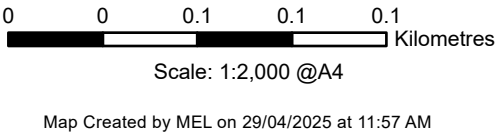
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40 & 48 Hasketts Rd - 2005 Aerial

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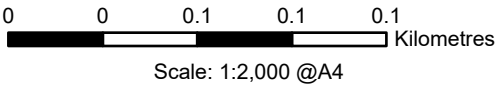
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40 & 48 Hasketts Rd - 2012 Aerial

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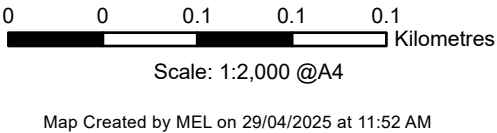
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40 & 48 Hasketts Rd - 2020 Aerial

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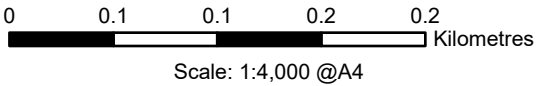
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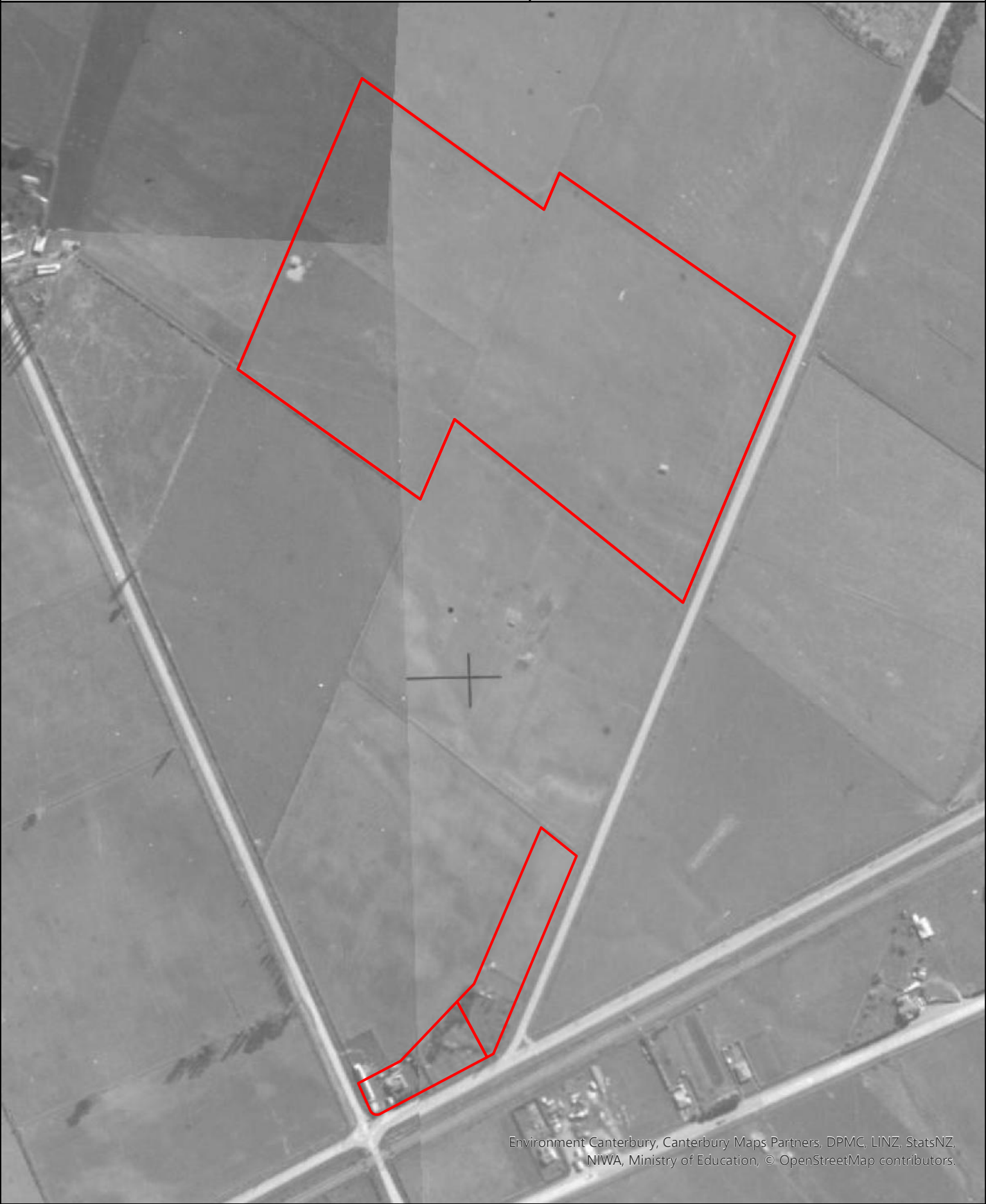
111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1941 Aerial

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111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1955 Aerial

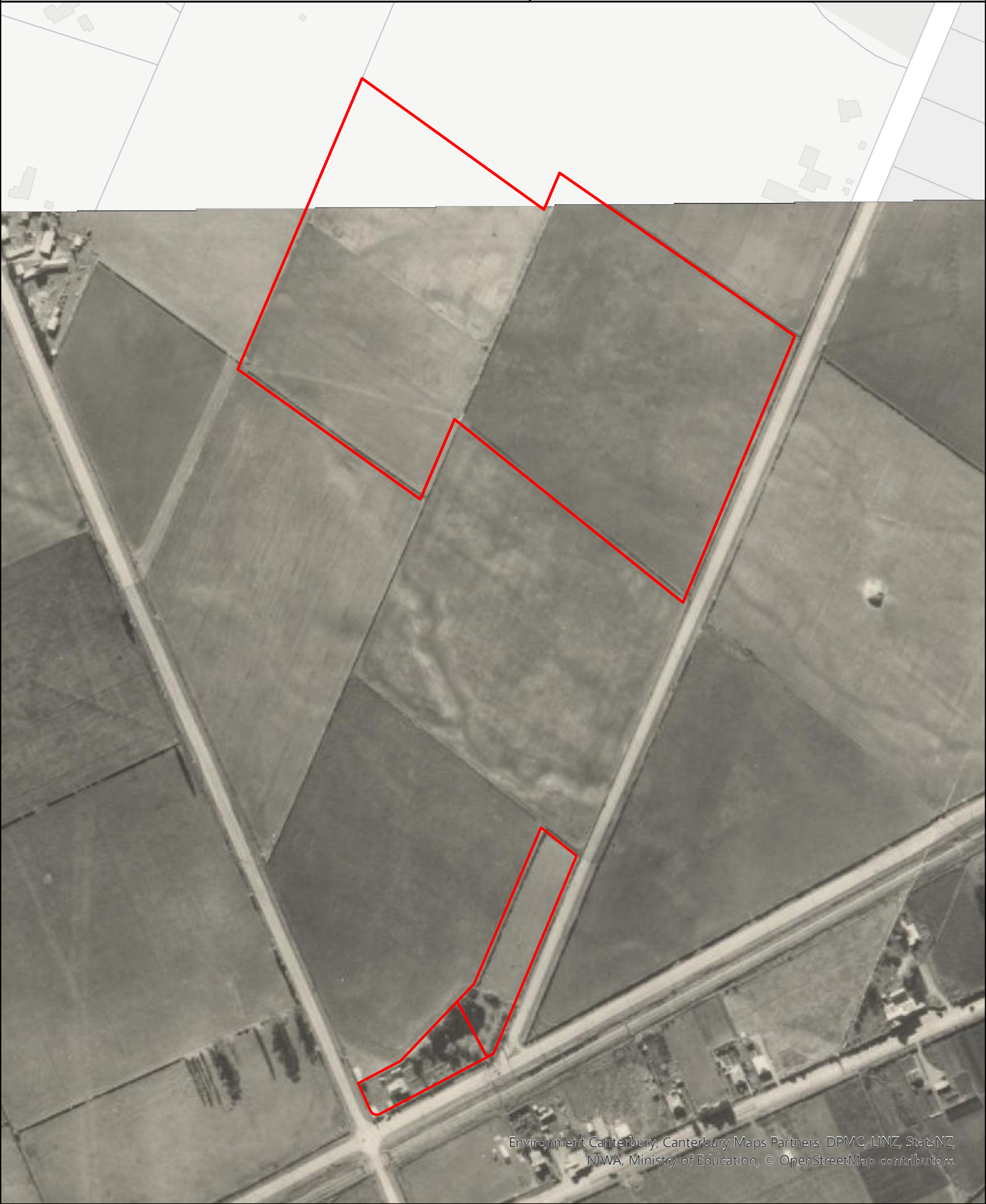
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Scale: 1:4,000 @A4

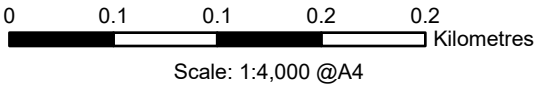
Map Created by MEL on 29/04/2025 at 11:46 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1965 Aerial

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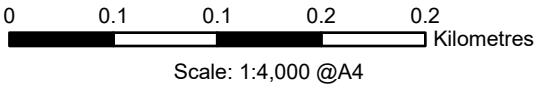
Map Created by MEL on 29/04/2025 at 11:47 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1974 Aerial

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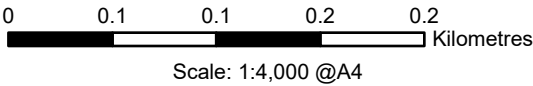
Map Created by MEL on 29/04/2025 at 11:47 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1984 Aerial

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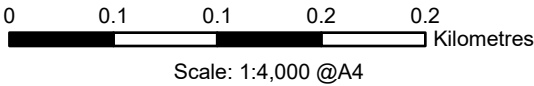
Map Created by MEL on 29/04/2025 at 11:47 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 1994 Aerial

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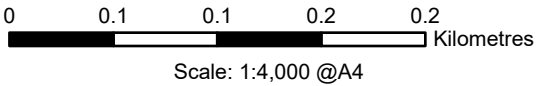
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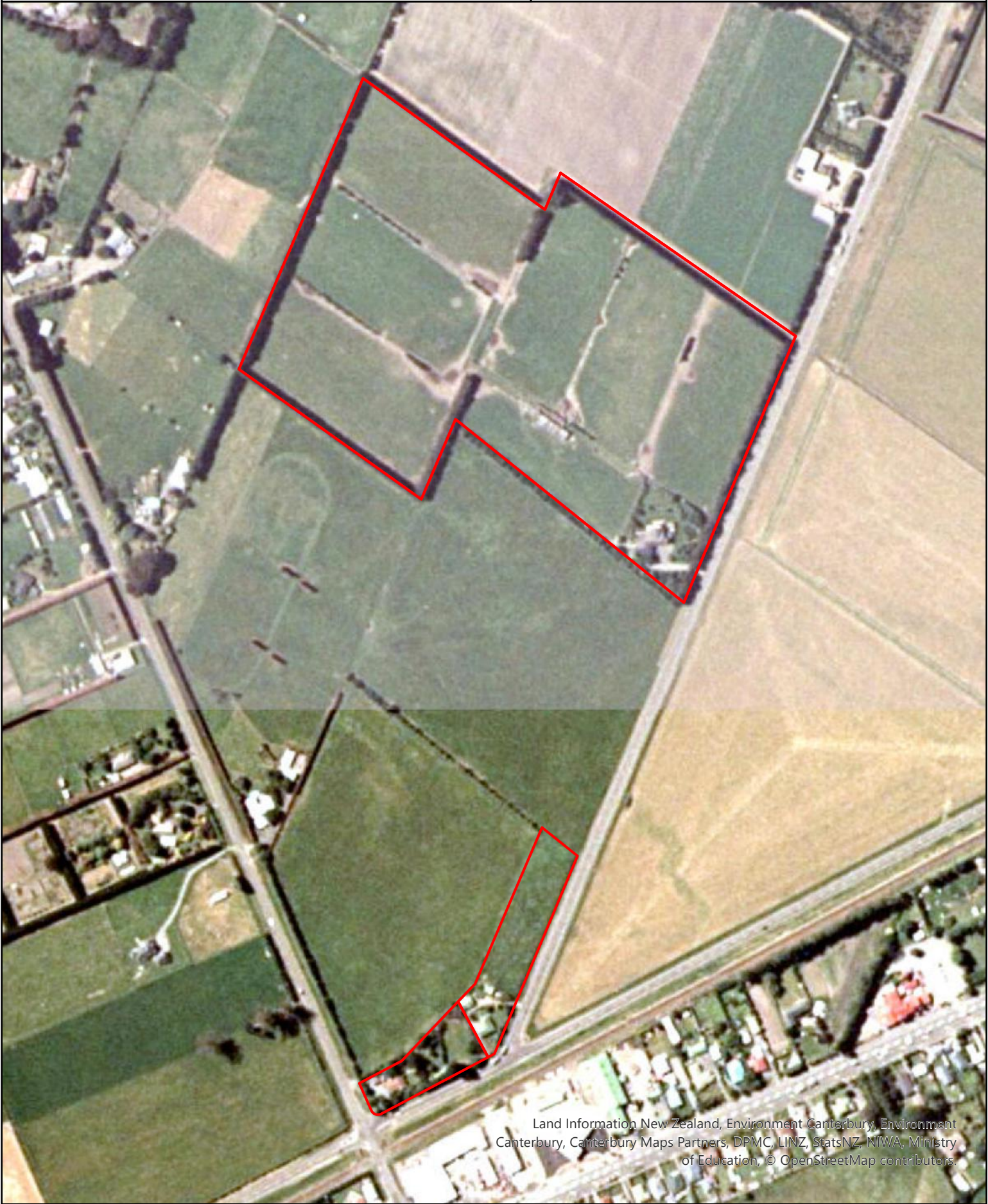
111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 2000 Aerial

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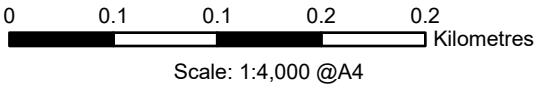
Map Created by MEL on 29/04/2025 at 11:44 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 2005 Aerial

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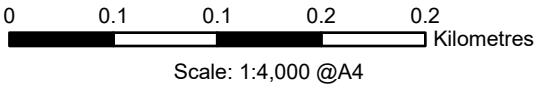
Map Created by MEL on 29/04/2025 at 11:44 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 2012 Aerial

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Map Created by MEL on 29/04/2025 at 11:44 AM



111 Pound Rd, 578 Waterloo Rd, 2 Barters Rd - 2020 Aerial

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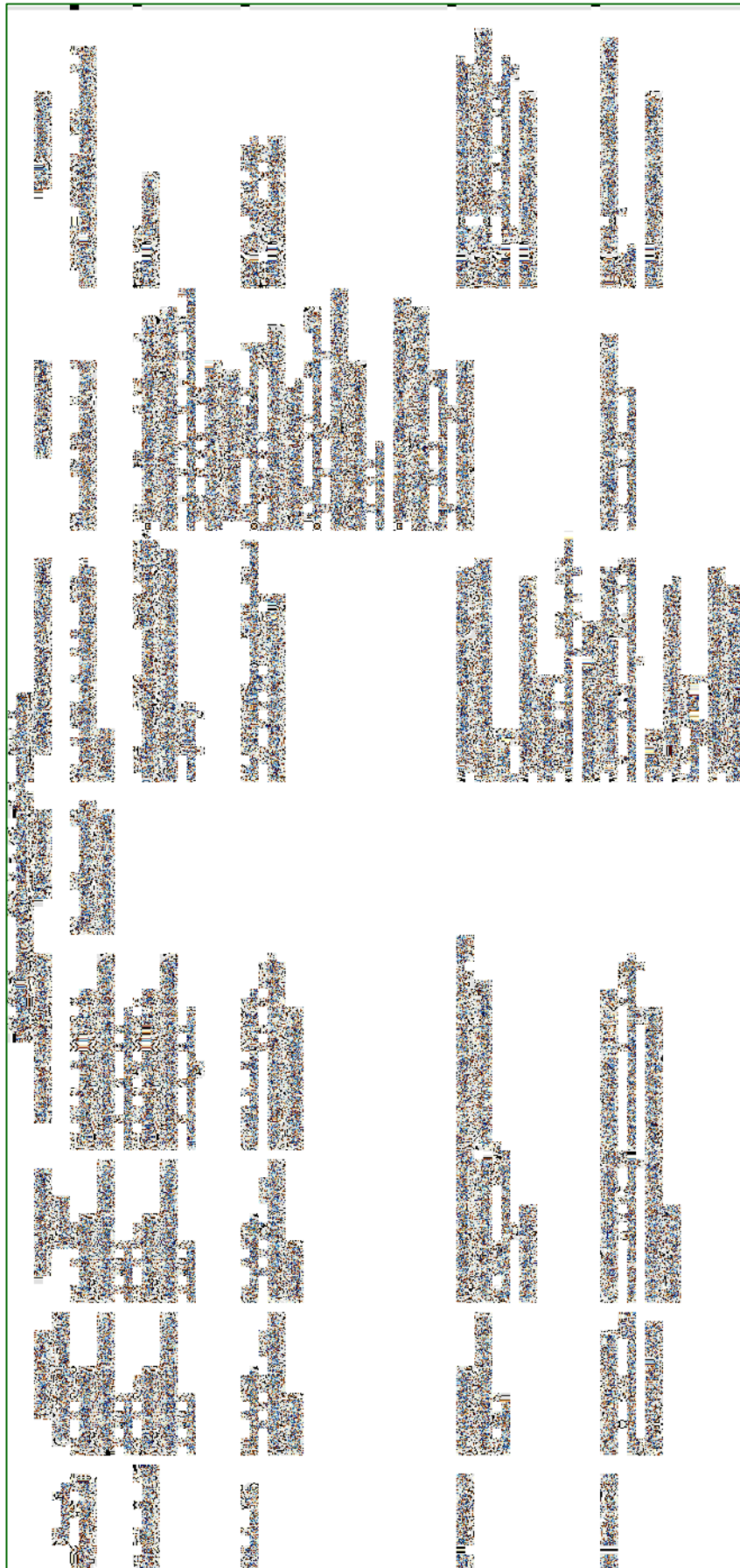


Scale: 1:4,000 @A4

Map Created by MEL on 29/04/2025 at 11:43 AM



Appendix E – Summary of PSI Findings



Appendix F – Site Inspection & Sample Location Plans



Gravel & silt stockpile (SP3) – most likely sourced from adjacent pit. XRF tests #43-45.

Excavated pit – green waste & concrete blocks visible

Shipping container shelter



Shed – corrugated iron & timber, concrete floor

Dwelling – stucco & decramastic tile

Garage – concrete block & iron roof

• SS3

• SS2

• SS4

• SS1

• SS5

Tree removal & firewood processing

Ash, brick & burnt items on stockpile (SP2)

Gravel & silt stockpile (SP1) – XRF tests #40, #41

Gravel driveway / parking area

Car port – corrugated iron

Garage/shed – corrugated iron & concrete floor

Shed – corrugated iron & timber, concrete floor

Graphic scale is approximate only



Date: 13 May 2025

Drawing No: 969/2

2 Barbers Road, Christchurch

Site Inspection & Sample Location Plan



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LEGEND

- text Potential HAIL activity / source of contamination
- text Description of structures/areas not considered to pose a risk
- SS1 Soil sample location

PLAN MUST BE PRINTED IN COLOUR

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



LEGEND

- SS1 Soil sample location
- SS1* Sample location analysed for asbestos
- ⊙ SS1 Soil sample location exceeds 'commercial/industrial' SGV for arsenic
- Approximate area requiring remediation



Approx. extent of site
shown on plan

Graphic scale is approximate only



Date: 19 May 2025

Drawing No: 942/7

4, 22 & 30 Hasketts Rd, Christchurch

Sample Location Plan

30H-BP1

22H-BP1

• 22H-BP2

22H-BP3/22H-ASB1*/Bulk1*

4H-BP1

4H-BP2

Piles of ash & waste items dumped since PSI. Careful removal will minimise volume of underlying soils requiring removal.

No SGV exceedances were found during DSI, however, XRF testing during PSI measured 162mg/kg arsenic. It is recommended burn area 4H-BP2 be remediated.

PLAN MUST BE PRINTED IN COLOUR

Notes:


- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
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LEGEND

- SS1 Soil sample location
-  Approximate area requiring further investigation following removal of waste pile

PLAN MUST BE PRINTED IN COLOUR



Graphic scale is approximate only



Date: 19 May 2025

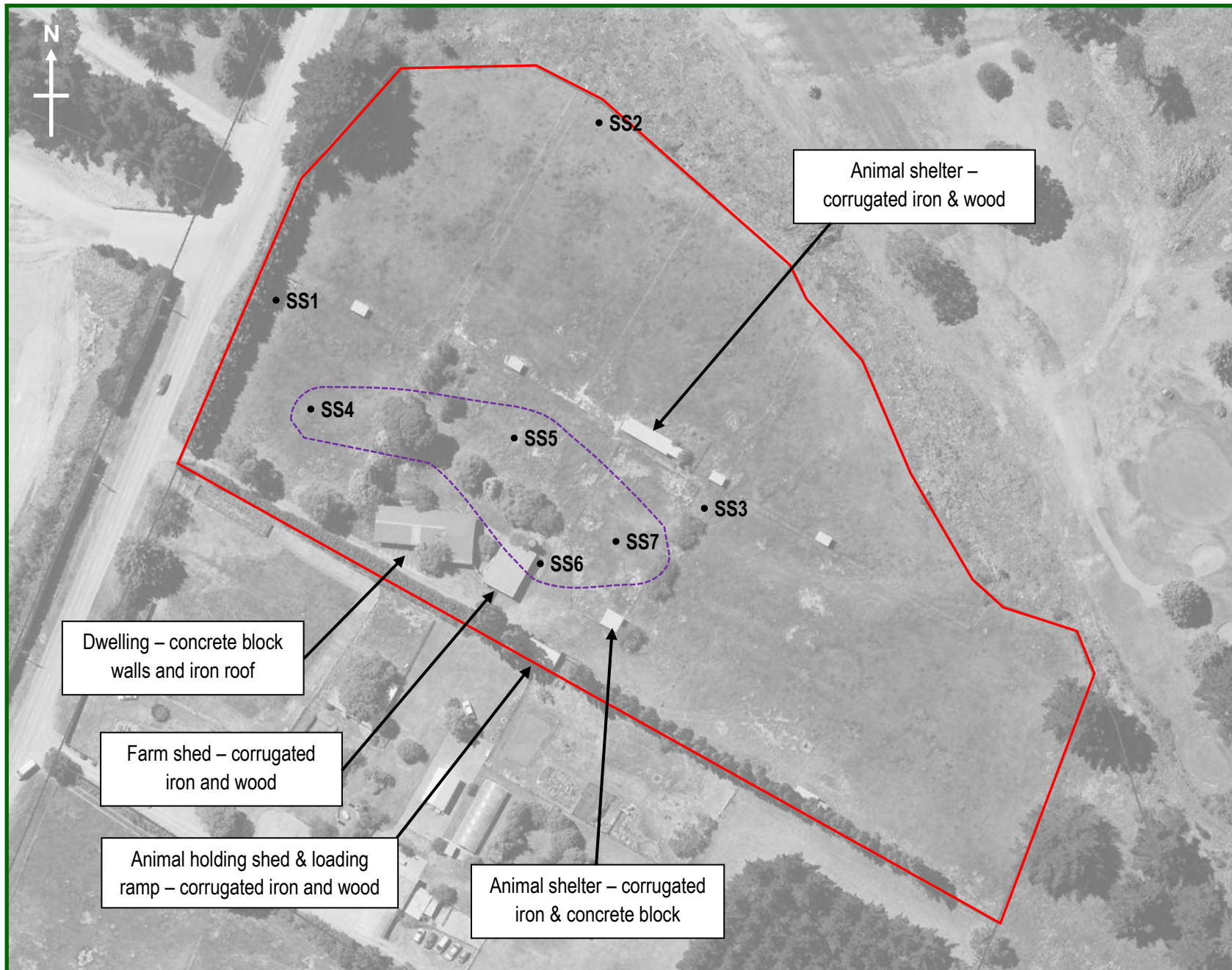
Drawing No: 942/6

38 Barters Rd & 570 Waterloo Rd, Christchurch

Sample Location Plan

Notes:

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- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



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LEGEND

- text Potential HAIL activity / source of contamination
- text Description of structures/areas not considered to pose a risk
- **SS1** Soil sample location
- Composite sample groups

PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only



Date: 13 May 2025

Drawing No: 969/3

48 Hasketts Road, Christchurch Site Inspection & Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



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LEGEND

- SS1 Soil sample location
- ⊙ SS1 Soil sample location exceeds
'commercial/industrial' SGVs

PLAN MUST BE PRINTED IN COLOUR



Approx. extent of site
shown on plan

Graphic scale is approximate only



Date: 21 May 2025

Drawing No: 942/4

Paddocks - 173 Pound Rd, Christchurch

Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



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LEGEND

- SS1 Soil sample location
- ⊙ SS1 Soil sample location exceeds 'commercial/industrial' SGVs
- Approximate area requiring remediation

Lab sample results were below SGVs, however, XRF testing indicates arsenic exceeding SGV is present within ash impacted area. Remediation is recommended.



Approx. extent of site
shown on plan

Graphic scale is approximate only



Date: 21 May 2025

Drawing No: 942/5

Yard - 173 Pound Rd, Christchurch Sample Location Plan

PLAN MUST BE PRINTED IN COLOUR

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



Burn area

Animal shelter –
corrugated iron & wood

• 578W-SS4
• 578W-SS2
• 578W-SS3
• 578W-SS1

Stucco & iron garage

Galvanised shed

Dwelling – Summerhill
stone with tile roof





Approx. extent of site
shown on plan



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LEGEND

-  Potential HAIL activity / source of contamination
-  Description of structures/areas not considered to pose a risk
- **SS1** Soil sample location
-  **SS1** Soil sample location exceeds 'commercial/industrial' SGV for arsenic
-  Approximate area requiring remediation

PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only



Date: 13 May 2025

Drawing No: 969/1

578 Waterloo Road, Christchurch Site Inspection & Sample Location Plan

Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only

Appendix G - Table of XRF Results

Table of XRF Results - Pound Road Industrial Development

Date of testing: 07 & 12 May 2025

Units: ppm



Sample ID (Lab tested in bold)	Sample Depth (mm)	XRF Reading No	Date	Time	Test Duration (secs)	Total Recoverable Arsenic		Total Recoverable Chromium		Total Recoverable Copper		Total Recoverable Lead		Total Recoverable Zinc	
						Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Blank	-	1	7/05/2025	9:18:01	40.0	<LOD	3	<LOD	43	<LOD	10	<LOD	4	<LOD	7
Calibration Test	-	2	7/05/2025	9:20:21	40.0	426	4	252	12	40	3	440	4	78	3
Calibration Test	-	3	7/05/2025	9:23:23	40.0	9	1	106	10	35	2	16	1	108	2
30 Hasketts - BP1	0	4	7/05/2025	10:32:52	38.0	48	1	124	8	101	2	130	1	475	3
30 Hasketts - BP1	0	5	7/05/2025	10:35:23	30.0	18	1	<LOD	32	28	2	100	1	161	2
30 Hasketts - BP1	0	6	7/05/2025	10:40:01	30.0	10	1	22	7	43	2	22	1	126	2
22 Hasketts - Weedy area with tyres	0	7	7/05/2025	11:04:18	30.0	7	1	<LOD	46	7	2	14	1	66	2
22 Hasketts - dumped ash and rubbish	0	8	7/05/2025	11:06:13	30.0	81	2	311	13	489	8	26	1	515	8
22 Hasketts - dumped ash and rubbish	0	9	7/05/2025	11:06:58	30.6	31	1	<LOD	31	1050	6	130	1	347	3
22 Hasketts - dumped ash, soil and rubbish (BP3)	0	10	7/05/2025	11:07:57	30.0	159	4	318	13	5863	26	925	6	1328	9
22 Hasketts - dumped ash, soil and rubbish (BP3)	0	11	7/05/2025	11:11:09	14.9	462	4	1222	24	1001	10	84	2	1221	10
22 Hasketts - dumped ash, soil and rubbish (BP3)	0	12	7/05/2025	11:11:36	30.0	1181	11	2007	27	8144	70	409	5	2950	27
22 Hasketts - BP1	0	13	7/05/2025	11:22:23	30.0	7	1	<LOD	29	36	2	60	1	186	2
22 Hasketts - BP1	0	14	7/05/2025	11:24:34	30.0	9	1	<LOD	38	53	2	32	1	257	3
22 Hasketts - BP1	0	15	7/05/2025	11:27:56	31.1	9	1	<LOD	62	14	3	14	1	99	3
22 Hasketts - BP1	0	16	7/05/2025	11:29:46	30.0	9	1	<LOD	32	517	5	55	1	170	2
22 Hasketts - BP1	0	17	7/05/2025	11:32:48	40.0	111	2	299	11	2061	10	80	1	1200	7
22 Hasketts - BP2	0	18	7/05/2025	11:45:45	30.0	3	1	<LOD	33	8	1	9	1	46	1
22 Hasketts - BP2	0	19	7/05/2025	11:47:06	30.0	<LOD	5	<LOD	55	13	3	<LOD	6	36	2
22 Hasketts - BP2	0	20	7/05/2025	11:48:14	30.7	4	1	<LOD	39	12	2	12	1	47	2
Blank	-	21	7/05/2025	12:12:52	40.0	<LOD	3	<LOD	43	<LOD	9	<LOD	4	<LOD	7
578 Waterloo - SS2.2	400	22	7/05/2025	12:15:32	39.6	98	5	92	12	331	4	1444	7	1883	10
578 Waterloo - SS3.1	50	23	7/05/2025	12:16:38	40.0	5	1	105	8	31	2	79	1	328	3
578 Waterloo - SS4.1	50	24	7/05/2025	12:18:26	40.0	9	1	25	8	16	2	75	1	394	3
2 Barthers - SS1.1	50	25	7/05/2025	12:53:55	40.0	6	1	<LOD	34	15	2	110	1	164	2
2 Barthers - SS1.1	50	26	7/05/2025	12:55:16	40.0	6	2	<LOD	41	25	2	295	2	354	4
2 Barthers - SS2.1	50	27	7/05/2025	12:59:48	30.0	10	2	<LOD	43	26	2	238	2	299	3
2 Barthers - SS2.1	50	28	7/05/2025	13:00:26	30.0	9	2	31	8	21	2	223	2	294	3
2 Barthers - SS2.1	50	29	7/05/2025	13:01:04	32.0	8	2	<LOD	41	24	2	223	2	291	3
2 Barthers - SS2.2	50	30	7/05/2025	13:06:29	30.0	6	2	<LOD	44	20	2	166	2	136	3
2 Barthers - SS2.2	50	31	7/05/2025	13:07:12	30.7	10	2	<LOD	44	26	2	225	3	202	3
2 Barthers - SS2.2	50	32	7/05/2025	13:07:49	30.7	10	2	<LOD	56	22	3	194	3	172	4
Blank	-	33	7/05/2025	13:10:52	30.0	<LOD	3	<LOD	42	<LOD	9	<LOD	4	<LOD	7
2 Barthers - SS3.1	0-50	34	7/05/2025	13:13:22	40.0	11	2	<LOD	36	38	2	261	2	519	4
2 Barthers - SS3.1	0-50	35	7/05/2025	13:14:09	40.0	20	2	<LOD	51	45	3	303	3	536	5
2 Barthers - SS3.1	0-50	36	7/05/2025	13:14:58	40.0	18	2	36	8	43	2	295	2	433	3
2 Barthers - SS3.2	250	37	7/05/2025	13:22:20	40.0	80	5	<LOD	50	34	3	1458	7	426	4
2 Barthers - SS3.2	250	38	7/05/2025	13:23:09	40.0	22	3	<LOD	69	46	4	261	3	786	8
2 Barthers - SS3.2	250	39	7/05/2025	13:23:58	40.0	19	3	35	10	52	2	652	4	684	5
2 Barthers - gravel stockpile SP1	0	40	7/05/2025	13:40:12	40.0	20	1	41	9	39	2	128	2	305	3
2 Barthers - gravel stockpile SP1	0	41	7/05/2025	13:41:30	40.0	4	1	40	12	8	3	17	1	49	2
2 Barthers - burnt soils on stockpile SP2	0	42	7/05/2025	13:42:24	17.2	91	5	129	11	199	4	1288	8	880	8
2 Barthers - gravel stockpile SP3	0	43	7/05/2025	13:46:42	40.0	3	1	<LOD	33	7	1	15	1	70	2
2 Barthers - gravel stockpile SP3	0	44	7/05/2025	13:47:41	40.0	3	1	<LOD	42	8	2	11	1	74	2
2 Barthers - gravel stockpile SP3	0	45	7/05/2025	13:48:51	40.0	6	1	<LOD	43	10	2	17	1	74	2
Calibration Test	-	1	12/05/2025	9:29:26	40.0	437	4	287	12	38	3	479	4	75	3
Calibration Test	-	2	12/05/2025	9:30:27	40.0	11	1	88	10	34	2	17	1	111	2
Blank	-	3	12/05/2025	9:31:47	40.0	<LOD	3	<LOD	43	<LOD	9	<LOD	4	<LOD	7
173 Pound - Burn Area	0	4	12/05/2025	9:36:49	30.7	44	1	109	11	114	3	17	1	434	4
173 Pound - Burn Area	0	5	12/05/2025	9:38:02	30.0	32	1	<LOD	55	157	4	52	1	737	6
173 Pound - Burn Area	0	6	12/05/2025	9:39:17	30.0	<LOD	6	<LOD	39	78	2	123	2	7938	25
173 Pound - Burn Area	0	7	12/05/2025	9:40:02	30.0	96	2	161	10	195	4	27	1	401	5
173 Pound - Burn Area	150	8	12/05/2025	9:46:02	33.4	5	1	25	8	13	2	14	1	93	2
173 Pound - Burn Area	0	9	12/05/2025	9:55:03	31.7	3	1	<LOD	38	30	2	16	1	231	3
173 Pound - Burn Area	400	10	12/05/2025	10:04:02	32.8	7	1	<LOD	38	83	2	28	1	229	3
173 Pound - Burn Area	0	11	12/05/2025	10:04:58	30.0	66	1	74	9	114	3	13	1	312	3
173 Pound - Burn Area	0	12	12/05/2025	10:05:46	30.0	8	1	40	9	17	2	15	1	86	2
173 Pound - Burn Area	0	13	12/05/2025	10:06:47	30.0	4	1	<LOD	41	11	2	14	1	63	2
173 Pound - Burn Area	0	14	12/05/2025	10:07:45	30.7	5	1	<LOD	45	14	2	19	1	78	2
Blank	-	15	12/05/2025	10:48:39	40.0	<LOD	3	<LOD	49	<LOD	11	<LOD	5	<LOD	8
38 Barthers - BP1	0	16	12/05/2025	12:30:27	30.6	1	0	<LOD	22	8	1	<LOD	3	54	1
38 Barthers - BP1	0	17	12/05/2025	12:31:54	31.2	5	0	<LOD	26	16	1	<LOD	3	48	1
38 Barthers - BP1	0	18	12/05/2025	12:33:12	30.0	4	1	<LOD	32	9	1	10	1	64	1
38 Barthers - BP1	0	19	12/05/2025	12:35:13	30.7	2	0	<LOD	29	10	1	5	1	48	1
570 Waterloo - Former Shed	0	20	12/05/2025	12:50:22	30.6	3	1	<LOD	23	18	1	68	1	269	3
570 Waterloo - Former Shed	0	21	12/05/2025	12:51:28	30.0	<LOD	6	<LOD	32	15	1	99	1	172	2
570 Waterloo - Former Shed	0	22	12/05/2025	12:52:20	30.7	<LOD	5	<LOD	36	13	2	54	1	89	2
570 Waterloo - Former Shed	0	23	12/05/2025	12:53:19	30.0	<LOD	4	<LOD	26	15	1	52	1	170	2
570 Waterloo - Former Shed	0	24	12/05/2025	12:54:11	30.0	6	1	<LOD	28	23	1	47	1	280	3
570 Waterloo - Former Shed	0	25	12/05/2025	12:54:50	30.0	6	1	<LOD	34	16	2	140	2	223	3
570 Waterloo - Former Shed	0	26	12/05/2025	13:00:29	30.0	<LOD	12	<LOD	49	22	2	332	3	253	3
4 Hasketts - BP1	0	27	12/05/2025	13:46:59	30.0	136	1	296	10	241	3	12	1	168	2
4 Hasketts - BP2	0	28	12/05/2025	13:55:28	30.0	20	1	88	9	222	4	33	1	614	5
4 Hasketts - BP2	0	29	12/05/2025	13:56:09	30.0	21	1	<LOD	43	215	3	100	2	1129	7
4 Hasketts - BP2	0	30	12/05/2025	13:56:50	30.7	45	1	62	8	116	3	31	1	2059	9
4 Hasketts - BP2	0	31	12/05/2025	13:57:32	26.4	4	1	<LOD	43	<LOD	9	14	1	59	2
4 Hasketts - BP2	0	32	12/05/2025	13:58:09	30.0	7	1	<LOD	40	81	2	15	1	629	4
Blank	-	33	12/05/2025	14:08:07	31.7	<LOD	3	<LOD	41	<LOD	9	<LOD	4	<LOD	6
Soil Guideline Values	Outdoor Worker					70		6,300		>10,000		3,300		400,000	
	Reference					NES		NES		NES		NES		NEPM	

Result exceeds 'commercial/industrial' SGV

Result likely exceeds 'commercial/industrial' SGV based on previous experience

Appendix H – Tables of Laboratory Results

Table of Laboratory Results - 22 Hasketts Rd, Christchurch

Date of sampling: 07 May 2025



Asbestos in Soils / Bulk Sample			Qualitative		Semi-Quantitative 500	
			Asbestos Presence / Absence	Description of Asbestos Form	Asbestos in ACM	Fibrous Asbestos + Asbestos Fines
Sample Name:	Depth (mm)	Lab Number			% w/w	% w/w
22H-ASB1	0-50	3882098.1	Asbestos NOT detected	-	-	-
Bulk 1	-	3882099.1	Asbestos NOT detected. Organic fibres detected. Synthetic mineral fibres detected.	-	-	-
Soil Guideline Values	Commercial & Industrial		-	-	0.05	0.001
	Reference		-	-	NZ GAMAS	NZ GAMAS

Indicates result exceeds 'Commercial & Industrial' guideline value

Indicates asbestos is present / present below guideline values

References:

NZGAMAS - New Zealand Guidelines for Assessing and Managing Asbestos in Soils, BRANZ, Oct. 2024

Table of Laboratory Results - 173 Pound Rd, Christchurch

Date of sampling: 12 May 2025



Sample Name:		173P-BP1.1	173P-BP1.2	173P-BP2.1	173P-BP2.2	173P-Y1.1	173P-Y2.1	173P-Y3.1	173P-Y4.1	173P-DUP2	173P-Y5.1	RPD	Soil Guideline Values				
Soil Results	Depth (mm):	0-50	150	0-50	400	0-50	0-50	0-50	0-50	0-50	0-50	173P-Y4.1 & 173P-DUP2	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3886043.1	3886043.2	3886043.3	3886043.4	3886043.5	3886043.6	3886043.7	3886043.8	3886043.14	3886043.9						
Heavy Metals																	
Arsenic	mg/kg	49	6	8	6	6	6	5	7	8	6	13%	70	NES	210	ANZWQ	12.58
Cadmium	mg/kg	0.33	0.21	0.48	0.31	0.16	0.23	0.15	< 0.10	0.11	0.22	0%	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	55	25	32	27	15	17	12	16	17	18	6%	6,300	NES	1,110	ANZWQ	22.70
Copper	mg/kg	74	12	31	19	11	15	9	10	12	12	18%	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	28	19	24	22	18.4	20	13.2	18.5	21	20	13%	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	17	15	19	19	11	12	9	10	10	12	0%	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	210	127	690	152	142	95	69	360	410	177	13%	400,000	NEPM	1,230	ANZWQ	93.94

Sample Name:		173P-Y6.1	173P-Y7.1	173P-Y8.1	173P-Y9.1	173P-SS1.1	173P-DUP1	173P-SS2.1	173P-SS3.1	173P-SS4.1	173P-SS5.1	RPD	Soil Guideline Values				
Soil Results	Depth (mm):	0-50	0-50	0-50	0-50	50	50	50	50	50	50	173P-SS1.1 & 173P-DUP1	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3886043.10	3886043.11	3886043.12	3886043.13	3886043.15	3886043.47	3886043.17	3886043.19	3886043.21	3886043.23						
Heavy Metals																	
Arsenic	mg/kg	9	6	6	9	6	6	6	7	6	5	0%	70	NES	210	ANZWQ	12.58
Boron	mg/kg	-	-	-	-	< 20	< 20	< 20	< 20	< 20	< 20	0%	>10,000	NES	-	-	9
Cadmium	mg/kg	0.11	0.19	0.16	0.2	0.18	0.19	0.17	0.21	0.16	0.16	5%	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	14	15	16	18	15	15	16	17	16	14	0%	6,300	NES	1,110	ANZWQ	22.70
Copper	mg/kg	22	13	17	16	9	8	13	11	10	9	12%	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	16.7	19	22	47	14.4	13.8	16.1	16.5	15.8	14.1	4%	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	9	10	10	10	12	11	13	13	13	13	9%	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	136	76	165	870	52	50	58	59	55	50	4%	400,000	NEPM	1,230	ANZWQ	93.94
Total Petroleum Hydrocarbons in Soil																	
C7 - C9	mg/kg dry wt	340	-	-	< 20	-	-	-	-	-	-	-	500	PHCS	-	-	-
C10 - C14	mg/kg dry wt	28,000	-	-	23	-	-	-	-	-	-	-	1,700	PHCS	-	-	-
C15 - C36	mg/kg dry wt	147,000	-	-	1,800	-	-	-	-	-	-	-	NA	PHCS	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	175,000	-	-	1,830	-	-	-	-	-	-	-	NA	PHCS	1,650	ANZWQ	-

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV
Indicates result exceeds Ecological Guideline Values
Indicates result exceeds Background

References:

- NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
- NEPM - National Environmental Protection Measures 2013, Australia
- ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high
- PHCS - Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE 1999) (Sandy SILT, Surface soils <1m depth)
- ₁ Concentrations for 'Regional, Recent' soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 173 Pound Rd, Christchurch

Date of sampling: 12 May 2025



Sample Name:		173P-SS6.1	173P-SS7.1	173P-SS8.1	173P-SS9.1	173P-SS10.1	173P-SS11.1	173P-SS12.1	173P-SS13.1	173P-SS14.1	173P-SS15.1	173P-SS16.1	Soil Guideline Values				
Soil Results	Depth (mm):	50	50	50	50	50	50	50	50	50	50	50	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3886043.25	3886043.27	3886043.29	3886043.31	3886043.33	3886043.35	3886043.37	3886043.39	3886043.41	3886043.43	3886043.45					
Heavy Metals																	
Arsenic	mg/kg	5	5	4	5	5	4	4	4	4	5	5	70	NES	210	ANZWQ	12.58
Boron	mg/kg	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	>10,000	NES	-	-	9
Cadmium	mg/kg	0.17	0.18	0.15	0.19	0.2	0.15	0.17	0.15	0.15	0.19	0.21	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	14	14	15	17	15	13	13	12	14	15	16	6,300	NES	1,110	ANZWQ	22.70
Copper	mg/kg	9	9	9	10	9	8	7	8	7	8	10	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	13.4	13	14.2	16	14.4	12.9	12	12.2	12.9	14.4	16.2	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	11	11	12	13	12	11	10	10	11	12	12	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	50	49	53	58	55	48	46	43	48	60	63	400,000	NEPM	1,230	ANZWQ	93.94

Table of Laboratory Results - 578 Waterloo Rd, Christchurch

Date of sampling: 07 May 2025

Sample Name:		578W-SS1.1	578W-SS1.2	578W-SS2.1	578W-SS2.2	578W-SS3.1	578W-SS4.1	Soil Guideline Values				
Soil Results	Depth:	50	250	50	400	50	50	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3881839.1	3881839.2	3881839.3	3881839.4	3881839.5	3881839.6					
Heavy Metals												
Arsenic	mg/kg	20	14	72	68	9	13	70	NES	210	ANZWQ	12.58
Cadmium	mg/kg	0.7	0.2	3.2	2.4	0.48	0.65	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	18	18	137	88	17	21	6,300	NES	1110	ANZWQ	22.70
Copper	mg/kg	24	15	114	101	24	27	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	102	46	630	500	115	111	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	14	14	18	15	12	18	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	240	174	1000	780	250	450	400,000	NEPM	1230	ANZWQ	93.94

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV
Indicates result exceeds Ecological Guideline Values
Indicates result exceeds Background

References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
NEPM - National Environmental Protection Measures 2013, Australia
ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high
PHCS - Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE 1999) (Sandy SILT, Surface soils <1m depth)
₁ Concentrations for 'Regional, Recent' soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 2 Barters Rd, Christchurch

Date of sampling: 07 May 2025



Sample Name:		2B-SS1.1	2B-SS1.2	2B-SS2.1	2B-SS2.2	2B-SS3.1	DUP2	2B-SS3.2	2B-SS4.1	2B-SS4.2	2B-SS5.1	RPD	Soil Guideline Values				
Soil Results	Depth (mm):	0-50	250	0-50	250	0-50	0-50	250	50	250	0-50	2B-SS3.1 & DUP2	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3882100.12	3882100.13	3882100.14	3882100.15	3882100.16	3882100.22	3882100.17	3882100.18	3882100.19	3882100.20						
Heavy Metals																	
Arsenic	mg/kg	6	6	7	6	9	9	9	9	9	13	0%	70	NES	210	ANZWQ	12.58
Cadmium	mg/kg	0.17	< 0.10	0.28	0.16	0.45	0.39	0.76	0.34	0.53	1.61	14%	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	16	18	18	19	19	19	18	17	22	34	0%	6,300	NES	1,110	ANZWQ	22.70
Copper	mg/kg	17	25	25	23	36	33	45	39	48	120	9%	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	151	95	340	470	310	290	470	290	400	1,230	7%	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	12	13	14	14	13	13	15	17	23	31	0%	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	186	130	310	152	310	300	620	310	430	920	3%	400,000	NEPM	1,230	ANZWQ	93.94

Table of Laboratory Results - 4, 22, 30 Hasketts Rd, 38 Barters, 570 Waterloo Rd Christchurch

Date of sampling: 07 & 12 May 2025

Sample Name:		4H-BP1	4H-BP2	22H-BP1	22H-BP2	22H-BP3	30H-BP1	38B-BP1	570W-SS1.1	570W-SS1.2	Soil Guideline Values				
Soil Results	Depth:	0-50	0-50	0-50	0-50	0-50	0-50	0-50	0-50	250	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3886043.51	3886043.52	3882100.9	3882100.10	3882100.11	3882100.8	3886043.48	3886043.49	3886043.50					
Heavy Metals															
Arsenic	mg/kg	147	21	154	6	1320	138	5	4	6	70	NES	210	ANZWQ	12.58
Cadmium	mg/kg	0.16	0.29	2.6	< 0.10	9	2.4	0.15	0.34	0.26	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	64	19	115	14	610	87	15	12	15	6,300	NES	1110	ANZWQ	22.70
Copper	mg/kg	89	61	250	7	3600	210	9	18	46	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	17.3	20	98	13.9	360	186	16.8	210	350	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	13	12	67	12	169	38	11	9	13	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	240	750	1370	49	4600	830	74	260	230	400,000	NEPM	1230	ANZWQ	93.94

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV
Indicates result exceeds Ecological Guideline Values
Indicates result exceeds Background

References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

NEPM - National Environmental Protection Measures 2013, Australia

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high

₁ Concentrations for 'Regional, Recent' soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 48 Hasketts Rd, Christchurch

Date of sampling: 07 May 2025



Sample Name:		SS1.1	DUP1	SS2.1	SS3.1	SS4.1	SS5.1	SS6.1	SS7.1	RPD	Soil Guideline Values				
Soil Results	Depth:	100	100	100	100	100	100	50	50	SS1.1 & DUP1	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background ₁
	Lab Number:	3882100.1	3882100.21	3882100.2	3882100.3	3882100.4	3882100.5	3882100.6	3882100.7						
Heavy Metals															
Arsenic	mg/kg	8	8	4	7	7	8	14	10	0%	70	NES	210	ANZWQ	12.58
Cadmium	mg/kg	0.13	0.14	< 0.10	0.12	0.11	0.15	0.14	0.12	7%	1,300	NES	30	ANZWQ	0.19
Chromium	mg/kg	17	17	12	15	17	18	17	18	0%	6,300	NES	1110	ANZWQ	22.70
Copper	mg/kg	9	9	6	9	9	9	14	10	0%	>10,000	NES	810	ANZWQ	20.30
Lead	mg/kg	18.1	17	13	16	17.5	17.8	30	18.3	6%	3,300	NES	660	ANZWQ	40.96
Nickel	mg/kg	13	13	10	12	14	14	12	14	0%	6,000	NEPM	156	ANZWQ	20.70
Zinc	mg/kg	56	58	44	55	55	61	105	63	4%	400,000	NEPM	1230	ANZWQ	93.94

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV
Indicates result exceeds Ecological Guideline Values
Indicates result exceeds Background

References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

NEPM - National Environmental Protection Measures 2013, Australia

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high

₁ Concentrations for 'Regional, Recent' soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 48 Hasketts Rd, 173 Pound Rd, Christchurch

Date of sampling: 07 & 12 May 2025



Sample Name:		Composite of SS4.1, SS5.1, SS6.1 & SS7.1 (48 Hasketts Rd)	Composite of 173P-SS1.1, 173P-SS2.1, 173P-SS3.1 & 173P-SS4.1	Composite of 173P-SS5.1, 173P-SS6.1, 173P-SS7.1 & 173P-SS8.1	Composite of 173P-SS9.1, 173P-SS10.1, 173P-SS11.1 & 173P-SS12.1	Composite of 173P-SS13.1, 173P-SS14.1, 173P-SS15.1 & 173P-SS16.1	Composite of 173P-Y7.1 & 173P-Y8.1	Soil Guideline Values		
Soil Results	Depth	100mm	50	50	50	50	0-50	Commercial/ Outdoor Worker	Reference	Background ₂
	Lab number	3882100.23	3886043.53	3886043.54	3886043.55	3886043.56	3886043.57			
Organochlorine Pesticides (OCPs) in soil										
Aldrin	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.013	< 0.012	-	160	NES	-
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.013	< 0.012	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.013	< 0.012	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.013	< 0.012	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	< 0.012	0.015	0.024	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	< 0.012	< 0.013	< 0.012	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	< 0.012	0.015	0.016	-	-	-	-
Total DDT	mg/kg dry wt	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	-	1,000	NES	0.43 ₂
Dieldrin	mg/kg dry wt	0.014	< 0.013	< 0.012	< 0.013	< 0.012	-	160	NES	-
Organonitro&phosphorus Pesticides (ONOPs) in Soil by GCMS										
Pendimethalin	mg/kg dry wt	-	0.08	0.08	< 0.07	< 0.07	<6	250000	USEPA	-

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV
Indicates result exceeds Ecological Guideline Values
Indicates result exceeds Background

Notes:

This table does not represent the full analytical results, please refer to the laboratory reports for full details.

References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

USEPA - US EPA Regional Screening Levels, <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>, Nov 2024

₂ Concentrations for 'Christchurch Metropolitan' soils from Ambient Concentrations of selected organochlorine in soils, Buckland, Ellis and Salter 1998

Table of Laboratory Results - 2 Barthers Rd & 48 Hasketts Rd, Christchurch

Date of sampling: 07 May 2025



Sample Name:		2B-SS5.1	Composite of SS1.1, SS2.1 & SS3.1 (48 Hasketts Rd)	Soil Guideline Values				
Soil Results	Depth:	0-50	0-50	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background
	Lab number:	3882100.20	3882100.24					
Polycyclic Aromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg dry wt	0.068	< 0.013	73	USEPA	-	-	-
2-Methylnaphthalene	mg/kg dry wt	0.07	< 0.019	300	USEPA	-	-	-
Acenaphthene	mg/kg dry wt	0.019	< 0.013	>10,000	GAS	-	-	0.55
Acenaphthylene	mg/kg dry wt	< 0.015	< 0.013	>10,000	GAS	-	-	0.069
Anthracene	mg/kg dry wt	0.029	< 0.013	>10,000	GAS	-	-	0.113
Benzo[a]anthracene *	mg/kg dry wt	0.159	< 0.013	-	-	-	-	0.47
Benzo[a]pyrene *	mg/kg dry wt	0.183	< 0.013	-	-	-	-	0.595
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	0.3	< 0.031	35	NES	-	-	0.922
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	0.3	< 0.031	-	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene *	mg/kg dry wt	0.34	0.014	-	-	-	-	0.947
Benzo[e]pyrene	mg/kg dry wt	0.152	< 0.013	7.3	USEPA	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.165	< 0.013	-	-	-	-	0.459
Benzo[k]fluoranthene *	mg/kg dry wt	0.112	< 0.013	-	-	-	-	0.296
Chrysene *	mg/kg dry wt	0.18	< 0.013	-	-	-	-	0.539
Dibenzo[a,h]anthracene *	mg/kg dry wt	0.036	< 0.013	-	-	-	-	0.112
Fluoranthene *	mg/kg dry wt	0.28	< 0.013	-	-	-	-	1.345
Fluorene	mg/kg dry wt	< 0.015	< 0.013	>10,000	GAS	-	-	0.06
Indeno(1,2,3-cd)pyrene *	mg/kg dry wt	0.178	< 0.013	-	-	-	-	0.385
Naphthalene	mg/kg dry wt	< 0.08	< 0.07	200	GAS	-	-	0.029
Perylene	mg/kg dry wt	0.034	< 0.013	6.7	USEPA	-	-	-
Phenanthrene	mg/kg dry wt	0.17	< 0.016	>10,000	GAS	-	-	0.703
Pyrene	mg/kg dry wt	0.28	< 0.013	>10,000	GAS	-	-	1.362
Total of Reported PAHs in Soil	mg/kg	2.5	< 0.4	-	-	150	ANZWQ	-

Indicates result exceeds 'Commercial/ Outdoor Worker' SGV

Indicates result exceeds Ecological Guideline Values

Indicates result exceeds Background

References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

GAS - Users' Guide to the Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand (MfE, 1997)

USEPA - US EPA Regional Screening Levels, <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>, Feb 2024

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high

₂ Background concentrations of polycyclic aromatic hydrocarbons in Christchurch urban soils, Tonkin and Taylor, Nov 2007

Appendix I – Laboratory Reports

Certificate of Analysis

Page 1 of 2

Client:	Momentum Environmental Limited	Lab No:	3881839	SPv1
Contact:	Nicola Peacock	Date Received:	07-May-2025	
	C/- Momentum Environmental Limited	Date Reported:	12-May-2025	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	969-578 Waterloo	
		Submitted By:	Nicola Peacock	

Sample Type: Soil

Sample Name:		578W_SS1.1 07-May-2025 10:55 am	578W_SS1.2 07-May-2025 10:58 am	578W_SS2.1 07-May-2025 11:17 am	578W_SS2.2 07-May-2025 11:20 am	578W_SS3.1 07-May-2025 11:26 am
Lab Number:		3881839.1	3881839.2	3881839.3	3881839.4	3881839.5
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	20	14	72	68	9
Total Recoverable Cadmium	mg/kg dry wt	0.70	0.20	3.2	2.4	0.48
Total Recoverable Chromium	mg/kg dry wt	18	18	137	88	17
Total Recoverable Copper	mg/kg dry wt	24	15	114	101	24
Total Recoverable Lead	mg/kg dry wt	102	46	630	500	115
Total Recoverable Nickel	mg/kg dry wt	14	14	18	15	12
Total Recoverable Zinc	mg/kg dry wt	240	174	1,000	780	250

Sample Name:	578W_SS4.1 07-May-2025 11:30 am
Lab Number:	3881839.6

Heavy Metals, Screen Level		
Total Recoverable Arsenic	mg/kg dry wt	13
Total Recoverable Cadmium	mg/kg dry wt	0.65
Total Recoverable Chromium	mg/kg dry wt	21
Total Recoverable Copper	mg/kg dry wt	27
Total Recoverable Lead	mg/kg dry wt	111
Total Recoverable Nickel	mg/kg dry wt	18
Total Recoverable Zinc	mg/kg dry wt	450

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).	-	1-6
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	1-6



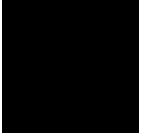
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These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 08-May-2025 and 12-May-2025. 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:	Momentum Environmental Limited	Lab No:	3882098	A2Pv1
Contact:	Fran Hobkirk	Date Received:	07-May-2025	
	C/- Momentum Environmental Limited	Date Reported:	12-May-2025	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	969 - Pound Rd Industrial	
		Submitted By:	Fran Hobkirk	

Sample Type: Soil

Sample Name:	22H-ASB1 07-May-2025 11:29 am		
Lab Number:	3882098.1		
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	607.9	
Dry Weight	g	514.4	
Moisture*	%	15	
Sample Fraction >10mm	g dry wt	201.9	
Sample Fraction <10mm to >2mm	g dry wt	183.0	
Sample Fraction <2mm	g dry wt	126.9	
<2mm Subsample Weight	g dry wt	52.8	
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.



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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	1
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	1
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1
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	1
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	1
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	1
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%	1
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1
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	1
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1
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	1
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1
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	1
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1

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

Testing was completed on 12-May-2025. 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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Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

Certificate of Analysis

Page 1 of 2

Client:	Momentum Environmental Limited	Lab No:	3882099	A2Pv1
Contact:	Fran Hobkirk	Date Received:	07-May-2025	
	C/- Momentum Environmental Limited	Date Reported:	12-May-2025	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	969 - Pound Rd Industrial	
		Submitted By:	Fran Hobkirk	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
Bulk 1	3882099.1	Lagging / Insulation	14.77	Asbestos NOT detected. Organic fibres detected. Synthetic mineral fibres detected.	N/A

Glossary of Terms

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

Summary of Methods

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

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1
Sample Weight on receipt	Sample weight (approximate). Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.01 g	1
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1
Description of Asbestos in Non Homogeneous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1



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

Testing was completed between 10-May-2025 and 12-May-2025. 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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Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

Certificate of Analysis

Page 1 of 4

Client:	Momentum Environmental Limited	Lab No:	3882100	SPv1
Contact:	Fran Hobkirk	Date Received:	07-May-2025	
	C/- Momentum Environmental Limited	Date Reported:	12-May-2025	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	969-Pound Rd Industrial	
		Submitted By:	Fran Hobkirk	

Sample Type: Soil

Sample Name:	SS1.1 07-May-2025 10:03 am	SS2.1 07-May-2025 9:57 am	SS3.1 07-May-2025 10:07 am	SS4.1 07-May-2025 10:09 am	SS5.1 07-May-2025 10:21 am
Lab Number:	3882100.1	3882100.2	3882100.3	3882100.4	3882100.5

Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	8	4	7	7	8
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	0.12	0.11	0.15
Total Recoverable Chromium	mg/kg dry wt	17	12	15	17	18
Total Recoverable Copper	mg/kg dry wt	9	6	9	9	9
Total Recoverable Lead	mg/kg dry wt	18.1	13.0	15.9	17.5	17.8
Total Recoverable Nickel	mg/kg dry wt	13	10	12	14	14
Total Recoverable Zinc	mg/kg dry wt	56	44	55	55	61

Sample Name:	SS6.1 07-May-2025 10:16 am	SS7.1 07-May-2025 10:15 am	30H-BP1 07-May-2025 10:52 am	22H-BP1 07-May-2025 11:44 am	22H-BP2 07-May-2025 11:59 am
Lab Number:	3882100.6	3882100.7	3882100.8	3882100.9	3882100.10

Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	14	10	138	154	6
Total Recoverable Cadmium	mg/kg dry wt	0.14	0.12	2.4	2.6	< 0.10
Total Recoverable Chromium	mg/kg dry wt	17	18	87	115	14
Total Recoverable Copper	mg/kg dry wt	14	10	210	250	7
Total Recoverable Lead	mg/kg dry wt	30	18.3	186	98	13.9
Total Recoverable Nickel	mg/kg dry wt	12	14	38	67	12
Total Recoverable Zinc	mg/kg dry wt	105	63	830	1,370	49

Sample Name:	22H-BP3 07-May-2025 11:30 am	2B-SS1.1 07-May-2025 1:01 pm	2B-SS1.2 07-May-2025 1:09 pm	2B-SS2.1 07-May-2025 1:12 pm	2B-SS2.2 07-May-2025 1:19 pm
Lab Number:	3882100.11	3882100.12	3882100.13	3882100.14	3882100.15

Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	1,320	6	6	7	6
Total Recoverable Cadmium	mg/kg dry wt	9.0	0.17	< 0.10	0.28	0.16
Total Recoverable Chromium	mg/kg dry wt	610	16	18	18	19
Total Recoverable Copper	mg/kg dry wt	3,600	17	25	25	23
Total Recoverable Lead	mg/kg dry wt	360	151	95	340	470
Total Recoverable Nickel	mg/kg dry wt	169	12	13	14	14
Total Recoverable Zinc	mg/kg dry wt	4,600	186	130	310	152



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Sample Type: Soil						
Sample Name:		2B-SS3.1 07-May-2025 1:28 pm	2B-SS3.2 07-May-2025 1:45 pm	2B-SS4.1 07-May-2025 1:22 pm	2B-SS4.2 07-May-2025 1:26 pm	2B-SS5.1 07-May-2025 1:54 pm
Lab Number:		3882100.16	3882100.17	3882100.18	3882100.19	3882100.20
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	-	-	68
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	9	9	9	9	13
Total Recoverable Cadmium	mg/kg dry wt	0.45	0.76	0.34	0.53	1.61
Total Recoverable Chromium	mg/kg dry wt	19	18	17	22	34
Total Recoverable Copper	mg/kg dry wt	36	45	39	48	120
Total Recoverable Lead	mg/kg dry wt	310	470	290	400	1,230
Total Recoverable Nickel	mg/kg dry wt	13	15	17	23	31
Total Recoverable Zinc	mg/kg dry wt	310	620	310	430	920
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	-	-	2.5
1-Methylnaphthalene	mg/kg dry wt	-	-	-	-	0.068
2-Methylnaphthalene	mg/kg dry wt	-	-	-	-	0.07
Acenaphthylene	mg/kg dry wt	-	-	-	-	0.019
Acenaphthene	mg/kg dry wt	-	-	-	-	< 0.015
Anthracene	mg/kg dry wt	-	-	-	-	0.029
Benzo[a]anthracene	mg/kg dry wt	-	-	-	-	0.159
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	-	0.183
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	-	0.30
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	-	0.30
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	-	0.34
Benzo[e]pyrene	mg/kg dry wt	-	-	-	-	0.152
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	-	0.165
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	-	0.112
Chrysene	mg/kg dry wt	-	-	-	-	0.180
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	-	0.036
Fluoranthene	mg/kg dry wt	-	-	-	-	0.28
Fluorene	mg/kg dry wt	-	-	-	-	< 0.015
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	-	0.178
Naphthalene	mg/kg dry wt	-	-	-	-	< 0.08
Perylene	mg/kg dry wt	-	-	-	-	0.034
Phenanthrene	mg/kg dry wt	-	-	-	-	0.170
Pyrene	mg/kg dry wt	-	-	-	-	0.28

Sample Name:		DUP1 07-May-2025 10:04 am	DUP2 07-May-2025 1:29 pm	Composite of SS4.1, SS5.1, SS6.1 & SS7.1	Composite of SS1.1, SS2.1 & SS3.1
Lab Number:		3882100.21	3882100.22	3882100.23	3882100.24
Individual Tests					
Dry Matter	g/100g as rcvd	-	-	78	78
Heavy Metals, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	8	9	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.14	0.39	-	-
Total Recoverable Chromium	mg/kg dry wt	17	19	-	-
Total Recoverable Copper	mg/kg dry wt	9	33	-	-
Total Recoverable Lead	mg/kg dry wt	17.1	290	-	-
Total Recoverable Nickel	mg/kg dry wt	13	13	-	-
Total Recoverable Zinc	mg/kg dry wt	58	300	-	-
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	-	< 0.013	-
alpha-BHC	mg/kg dry wt	-	-	< 0.013	-
beta-BHC	mg/kg dry wt	-	-	< 0.013	-
delta-BHC	mg/kg dry wt	-	-	< 0.013	-

Sample Type: Soil					
Sample Name:		DUP1 07-May-2025 10:04 am	DUP2 07-May-2025 1:29 pm	Composite of SS4.1, SS5.1, SS6.1 & SS7.1	Composite of SS1.1, SS2.1 & SS3.1
Lab Number:		3882100.21	3882100.22	3882100.23	3882100.24
Organochlorine Pesticides Screening in Soil					
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.013	-
cis-Chlordane	mg/kg dry wt	-	-	< 0.013	-
trans-Chlordane	mg/kg dry wt	-	-	< 0.013	-
2,4'-DDD	mg/kg dry wt	-	-	< 0.013	-
4,4'-DDD	mg/kg dry wt	-	-	< 0.013	-
2,4'-DDE	mg/kg dry wt	-	-	< 0.013	-
4,4'-DDE	mg/kg dry wt	-	-	< 0.013	-
2,4'-DDT	mg/kg dry wt	-	-	< 0.013	-
4,4'-DDT	mg/kg dry wt	-	-	< 0.013	-
Total DDT Isomers	mg/kg dry wt	-	-	< 0.08	-
Dieldrin	mg/kg dry wt	-	-	0.014	-
Endosulfan I	mg/kg dry wt	-	-	< 0.013	-
Endosulfan II	mg/kg dry wt	-	-	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.013	-
Endrin	mg/kg dry wt	-	-	< 0.013	-
Endrin aldehyde	mg/kg dry wt	-	-	< 0.013	-
Endrin ketone	mg/kg dry wt	-	-	< 0.013	-
Heptachlor	mg/kg dry wt	-	-	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.013	-
Methoxychlor	mg/kg dry wt	-	-	< 0.013	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	-	< 0.4
1-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.013
2-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.019
Acenaphthylene	mg/kg dry wt	-	-	-	< 0.013
Acenaphthene	mg/kg dry wt	-	-	-	< 0.013
Anthracene	mg/kg dry wt	-	-	-	< 0.013
Benzo[a]anthracene	mg/kg dry wt	-	-	-	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	< 0.031
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	< 0.031
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	0.014
Benzo[e]pyrene	mg/kg dry wt	-	-	-	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	< 0.013
Chrysene	mg/kg dry wt	-	-	-	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	< 0.013
Fluoranthene	mg/kg dry wt	-	-	-	< 0.013
Fluorene	mg/kg dry wt	-	-	-	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	< 0.013
Naphthalene	mg/kg dry wt	-	-	-	< 0.07
Perylene	mg/kg dry wt	-	-	-	< 0.013
Phenanthrene	mg/kg dry wt	-	-	-	< 0.016
Pyrene	mg/kg dry wt	-	-	-	< 0.013

Summary of Methods

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

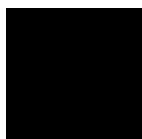
Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-22
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	20, 24
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	1-22
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	23
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	20, 24
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	20, 23-24
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-7
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	20, 24
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	20, 24

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

Testing was completed between 08-May-2025 and 12-May-2025. 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.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 7

Client:	Momentum Environmental Limited	Lab No:	3886043	SPV1
Contact:	Fran Hobkirk	Date Received:	12-May-2025	
	C/- Momentum Environmental Limited	Date Reported:	19-May-2025	
	19 Robertsons Road	Quote No:	72157	
	Kirwee 7671	Order No:		
		Client Reference:	969 - Pound Rd Industrial Dev	
		Submitted By:	Fran Hobkirk	

Sample Type: Soil

Sample Name:	173P-BP1.1 12-May-2025 9:55 am	173P-BP1.2 12-May-2025 9:58 am	173P-BP2.1 12-May-2025 10:06 am	173P-BP2.2 12-May-2025 10:11 am	173P-Y1.1 12-May-2025 10:35 am
Lab Number:	3886043.1	3886043.2	3886043.3	3886043.4	3886043.5

Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	49	6	8	6	6
Total Recoverable Cadmium	mg/kg dry wt	0.33	0.21	0.48	0.31	0.16
Total Recoverable Chromium	mg/kg dry wt	55	25	32	27	15
Total Recoverable Copper	mg/kg dry wt	74	12	31	19	11
Total Recoverable Lead	mg/kg dry wt	28	18.7	24	22	18.4
Total Recoverable Nickel	mg/kg dry wt	17	15	19	19	11
Total Recoverable Zinc	mg/kg dry wt	210	127	690	152	142

Sample Name:	173P-Y2.1 12-May-2025 10:39 am	173P-Y3.1 12-May-2025 10:42 am	173P-Y4.1 12-May-2025 10:50 am	173P-Y5.1 12-May-2025 10:54 am	173P-Y6.1 12-May-2025 11:08 am
Lab Number:	3886043.6	3886043.7	3886043.8	3886043.9	3886043.10

Individual Tests

Dry Matter	g/100g as rcvd	-	-	-	-	64
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Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	6	5	7	6	9
Total Recoverable Cadmium	mg/kg dry wt	0.23	0.15	< 0.10	0.22	0.11
Total Recoverable Chromium	mg/kg dry wt	17	12	16	18	14
Total Recoverable Copper	mg/kg dry wt	15	9	10	12	22
Total Recoverable Lead	mg/kg dry wt	20	13.2	18.5	20	16.7
Total Recoverable Nickel	mg/kg dry wt	12	9	10	12	9
Total Recoverable Zinc	mg/kg dry wt	95	69	360	177	136

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	-	-	-	-	340
C10 - C14	mg/kg dry wt	-	-	-	-	28,000
C15 - C36	mg/kg dry wt	-	-	-	-	147,000
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	-	-	175,000

Sample Name:	173P-Y7.1 12-May-2025 11:12 am	173P-Y8.1 12-May-2025 11:17 am	173P-Y9.1 12-May-2025 11:27 am	173P-DUP2 12-May-2025 10:51 am	173P-SS1.1 12-May-2025 10:11 am
Lab Number:	3886043.11	3886043.12	3886043.13	3886043.14	3886043.15

Individual Tests

Dry Matter	g/100g as rcvd	-	-	70	-	-
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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.

Sample Type: Soil						
Sample Name:		173P-Y7.1 12-May-2025 11:12 am	173P-Y8.1 12-May-2025 11:17 am	173P-Y9.1 12-May-2025 11:27 am	173P-DUP2 12-May-2025 10:51 am	173P-SS1.1 12-May-2025 10:11 am
Lab Number:		3886043.11	3886043.12	3886043.13	3886043.14	3886043.15
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	6	9	8	-
Total Recoverable Cadmium	mg/kg dry wt	0.19	0.16	0.20	0.11	-
Total Recoverable Chromium	mg/kg dry wt	15	16	18	17	-
Total Recoverable Copper	mg/kg dry wt	13	17	16	12	-
Total Recoverable Lead	mg/kg dry wt	19.2	22	47	21	-
Total Recoverable Nickel	mg/kg dry wt	10	10	10	10	-
Total Recoverable Zinc	mg/kg dry wt	76	165	870	410	-
7 Heavy metals plus Boron						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	-	6
Total Recoverable Boron	mg/kg dry wt	-	-	-	-	< 20
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	-	0.18
Total Recoverable Chromium	mg/kg dry wt	-	-	-	-	15
Total Recoverable Copper	mg/kg dry wt	-	-	-	-	9
Total Recoverable Lead	mg/kg dry wt	-	-	-	-	14.4
Total Recoverable Nickel	mg/kg dry wt	-	-	-	-	12
Total Recoverable Zinc	mg/kg dry wt	-	-	-	-	52
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	< 20	-	-
C10 - C14	mg/kg dry wt	-	-	23	-	-
C15 - C36	mg/kg dry wt	-	-	1,800	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	1,830	-	-
Sample Name:		173P-SS2.1 12-May-2025 10:05 am	173P-SS3.1 12-May-2025 10:18 am	173P-SS4.1 12-May-2025 10:32 am	173P-SS5.1 12-May-2025 10:40 am	173P-SS6.1 12-May-2025 10:26 am
Lab Number:		3886043.17	3886043.19	3886043.21	3886043.23	3886043.25
7 Heavy metals plus Boron						
Total Recoverable Arsenic	mg/kg dry wt	6	7	6	5	5
Total Recoverable Boron	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
Total Recoverable Cadmium	mg/kg dry wt	0.17	0.21	0.16	0.16	0.17
Total Recoverable Chromium	mg/kg dry wt	16	17	16	14	14
Total Recoverable Copper	mg/kg dry wt	13	11	10	9	9
Total Recoverable Lead	mg/kg dry wt	16.1	16.5	15.8	14.1	13.4
Total Recoverable Nickel	mg/kg dry wt	13	13	13	13	11
Total Recoverable Zinc	mg/kg dry wt	58	59	55	50	50
Sample Name:		173P-SS7.1 12-May-2025 11:10 am	173P-SS8.1 12-May-2025 10:57 am	173P-SS9.1 12-May-2025 10:59 am	173P-SS10.1 12-May-2025 11:14 am	173P-SS11.1 12-May-2025 11:27 am
Lab Number:		3886043.27	3886043.29	3886043.31	3886043.33	3886043.35
7 Heavy metals plus Boron						
Total Recoverable Arsenic	mg/kg dry wt	5	4	5	5	4
Total Recoverable Boron	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
Total Recoverable Cadmium	mg/kg dry wt	0.18	0.15	0.19	0.20	0.15
Total Recoverable Chromium	mg/kg dry wt	14	15	17	15	13
Total Recoverable Copper	mg/kg dry wt	9	9	10	9	8
Total Recoverable Lead	mg/kg dry wt	13.4	14.2	16.4	14.4	12.9
Total Recoverable Nickel	mg/kg dry wt	11	12	13	12	11
Total Recoverable Zinc	mg/kg dry wt	49	53	58	55	48
Sample Name:		173P-SS12.1 12-May-2025 11:23 am	173P-SS13.1 12-May-2025 11:56 am	173P-SS14.1 12-May-2025 12:08 pm	173P-SS15.1 12-May-2025 12:16 pm	173P-SS16.1 12-May-2025 12:05 pm
Lab Number:		3886043.37	3886043.39	3886043.41	3886043.43	3886043.45
7 Heavy metals plus Boron						
Total Recoverable Arsenic	mg/kg dry wt	4	4	4	5	5
Total Recoverable Boron	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20

Sample Type: Soil						
Sample Name:		173P-SS12.1 12-May-2025 11:23 am	173P-SS13.1 12-May-2025 11:56 am	173P-SS14.1 12-May-2025 12:08 pm	173P-SS15.1 12-May-2025 12:16 pm	173P-SS16.1 12-May-2025 12:05 pm
Lab Number:		3886043.37	3886043.39	3886043.41	3886043.43	3886043.45
7 Heavy metals plus Boron						
Total Recoverable Cadmium	mg/kg dry wt	0.17	0.15	0.15	0.19	0.21
Total Recoverable Chromium	mg/kg dry wt	13	12	14	15	16
Total Recoverable Copper	mg/kg dry wt	7	8	7	8	10
Total Recoverable Lead	mg/kg dry wt	12.0	12.2	12.9	14.4	16.2
Total Recoverable Nickel	mg/kg dry wt	10	10	11	12	12
Total Recoverable Zinc	mg/kg dry wt	46	43	48	60	63
Sample Name:		173P-DUP1 12-May-2025 10:12 am	38B-BP1 12-May-2025 12:47 pm	570w-SS1.1 12-May-2025 1:06 pm	570w-SS1.2 12-May-2025 1:11 pm	4H-BP1 12-May-2025 1:58 pm
Lab Number:		3886043.47	3886043.48	3886043.49	3886043.50	3886043.51
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	5	4	6	147
Total Recoverable Cadmium	mg/kg dry wt	-	0.15	0.34	0.26	0.16
Total Recoverable Chromium	mg/kg dry wt	-	15	12	15	64
Total Recoverable Copper	mg/kg dry wt	-	9	18	46	89
Total Recoverable Lead	mg/kg dry wt	-	16.8	210	350	17.3
Total Recoverable Nickel	mg/kg dry wt	-	11	9	13	13
Total Recoverable Zinc	mg/kg dry wt	-	74	260	230	240
7 Heavy metals plus Boron						
Total Recoverable Arsenic	mg/kg dry wt	6	-	-	-	-
Total Recoverable Boron	mg/kg dry wt	< 20	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.19	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	15	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	8	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	13.8	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	11	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	50	-	-	-	-
Sample Name:		4H-BP2 12-May-2025 2:09 pm	Composite of 173P-SS1.1, 173P-SS2.1, 173P-SS3.1 & 173P-SS4.1	Composite of 173P-SS5.1, 173P-SS6.1, 173P-SS7.1 & 173P-SS8.1	Composite of 173P-SS9.1, 173P-SS10.1, 173P-SS11.1 & 173P-SS12.1	Composite of 173P-SS13.1, 173P-SS14.1, 173P-SS15.1 & 173P-SS16.1
Lab Number:		3886043.52	3886043.53	3886043.54	3886043.55	3886043.56
Individual Tests						
Dry Matter	g/100g as rcvd	-	82	82	81	83
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	21	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.29	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	19	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	61	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	20	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	12	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	750	-	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
alpha-BHC	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
beta-BHC	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
delta-BHC	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
cis-Chlordane	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
trans-Chlordane	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
2,4'-DDD	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
4,4'-DDD	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
2,4'-DDE	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012

Sample Type: Soil						
Sample Name:		4H-BP2 12-May-2025 2:09 pm	Composite of 173P-SS1.1, 173P-SS2.1, 173P-SS3.1 & 173P-SS4.1	Composite of 173P-SS5.1, 173P-SS6.1, 173P-SS7.1 & 173P-SS8.1	Composite of 173P-SS9.1, 173P-SS10.1, 173P-SS11.1 & 173P-SS12.1	Composite of 173P-SS13.1, 173P-SS14.1, 173P-SS15.1 & 173P-SS16.1
Lab Number:		3886043.52	3886043.53	3886043.54	3886043.55	3886043.56
Organochlorine Pesticides Screening in Soil						
4,4'-DDE	mg/kg dry wt	-	< 0.013	< 0.012	0.015	0.024
2,4'-DDT	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
4,4'-DDT	mg/kg dry wt	-	< 0.013	< 0.012	0.015	0.016
Total DDT Isomers	mg/kg dry wt	-	< 0.08	< 0.08	< 0.08	< 0.08
Dieldrin	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endosulfan I	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endosulfan II	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endosulfan sulphate	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endrin	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endrin aldehyde	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Endrin ketone	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Heptachlor	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Heptachlor epoxide	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Hexachlorobenzene	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Methoxychlor	mg/kg dry wt	-	< 0.013	< 0.012	< 0.013	< 0.012
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Alachlor	mg/kg dry wt	-	< 0.05	< 0.05	< 0.05	< 0.05
Atrazine	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Atrazine-desethyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Atrazine-desisopropyl	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Azaconazole	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Azinphos-methyl	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Benalaxyl	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Bitertanol	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Bromacil	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Bromopropylate	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Butachlor	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Captan	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Carbaryl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Carbofuran	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Chlorfluazuron	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Chlorothalonil	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Chlorpyrifos	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Chlorpyrifos-methyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Chlortoluron	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Cyanazine	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Cyfluthrin	mg/kg dry wt	-	< 0.08	< 0.08	< 0.08	< 0.08
Cyhalothrin	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Cypermethrin	mg/kg dry wt	-	< 0.16	< 0.16	< 0.16	< 0.15
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Diazinon	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Dichlofluanid	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Dichloran	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	mg/kg dry wt	-	< 0.09	< 0.09	< 0.09	< 0.09
Difenoconazole	mg/kg dry wt	-	< 0.09	< 0.09	< 0.10	< 0.09
Dimethoate	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Diphenylamine	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Diuron	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Fenpropimorph	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Fluazifop-butyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Fluometuron	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07

Sample Type: Soil						
Sample Name:		4H-BP2 12-May-2025 2:09 pm	Composite of 173P-SS1.1, 173P-SS2.1, 173P-SS3.1 & 173P-SS4.1	Composite of 173P-SS5.1, 173P-SS6.1, 173P-SS7.1 & 173P-SS8.1	Composite of 173P-SS9.1, 173P-SS10.1, 173P-SS11.1 & 173P-SS12.1	Composite of 173P-SS13.1, 173P-SS14.1, 173P-SS15.1 & 173P-SS16.1
Lab Number:		3886043.52	3886043.53	3886043.54	3886043.55	3886043.56
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Flusilazole	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Fluvalinate	mg/kg dry wt	-	< 0.05	< 0.05	< 0.05	< 0.05
Furalaxyl	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Haloxypop-methyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Hexaconazole	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Hexazinone	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Kresoxim-methyl	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Linuron	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Malathion	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Metalaxyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Methamidophos	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Metolachlor	mg/kg dry wt	-	< 0.05	< 0.05	< 0.05	< 0.05
Metribuzin	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Molinate	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Myclobutanil	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Naled	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Norflurazon	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Oxadiazon	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Oxyfluorfen	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Paclobutrazol	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Parathion-ethyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Parathion-methyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Pendimethalin	mg/kg dry wt	-	0.08	0.08	< 0.07	< 0.07
Permethrin	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	< 0.03
Pirimicarb	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Pirimiphos-methyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Prochloraz	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Procymidone	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Prometryn	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Propachlor	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Propanil	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Propazine	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Propiconazole	mg/kg dry wt	-	< 0.05	< 0.05	< 0.05	< 0.05
Pyriproxyfen	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Quizalofop-ethyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Simazine	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Simetryn	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Sulfentrazone	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	-	< 0.13	< 0.13	< 0.13	< 0.13
Tebuconazole	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Terbacil	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Terbumeton	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Terbuthylazine	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Terbuthylazine-desethyl	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Terbutryn	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Thiabendazole	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Thiobencarb	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Tolylfluanid	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	< 0.04
Triazophos	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07
Trifluralin	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07	< 0.07

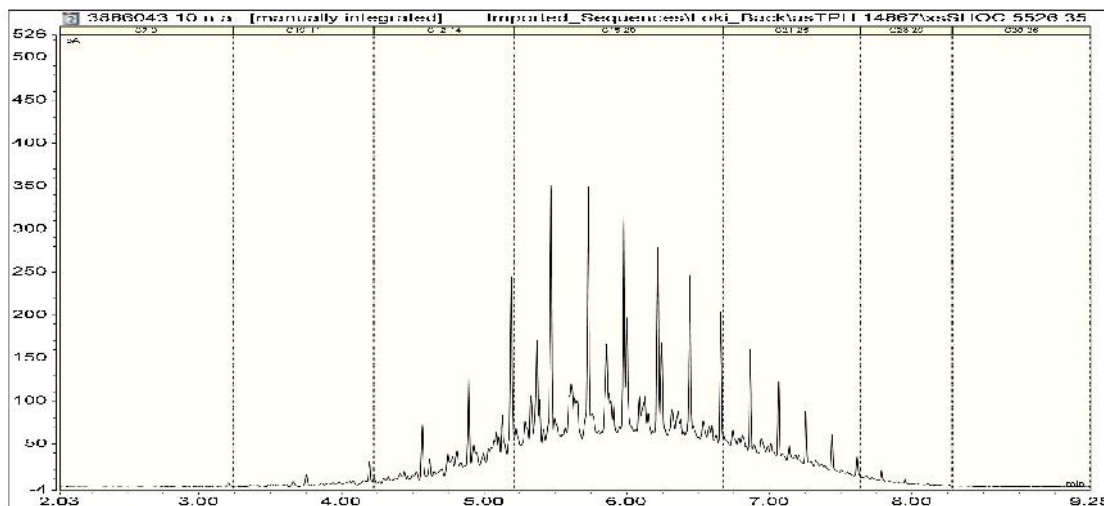
Sample Type: Soil

Sample Name:	4H-BP2	Composite of	Composite of	Composite of	Composite of
	12-May-2025 2:09 pm	173P-SS1.1, 173P-SS2.1, 173P-SS3.1 & 173P-SS4.1	173P-SS5.1, 173P-SS6.1, 173P-SS7.1 & 173P-SS8.1	173P-SS9.1, 173P-SS10.1, 173P-SS11.1 & 173P-SS12.1	173P-SS13.1, 173P-SS14.1, 173P-SS15.1 & 173P-SS16.1
Lab Number:	3886043.52	3886043.53	3886043.54	3886043.55	3886043.56
Organonitro&phosphorus Pesticides Screen in Soil by GCMS					
Vinclozolin	mg/kg dry wt	-	< 0.07	< 0.07	< 0.07

3886043.10

173P-Y6.1 12-May-2025 11:08 am

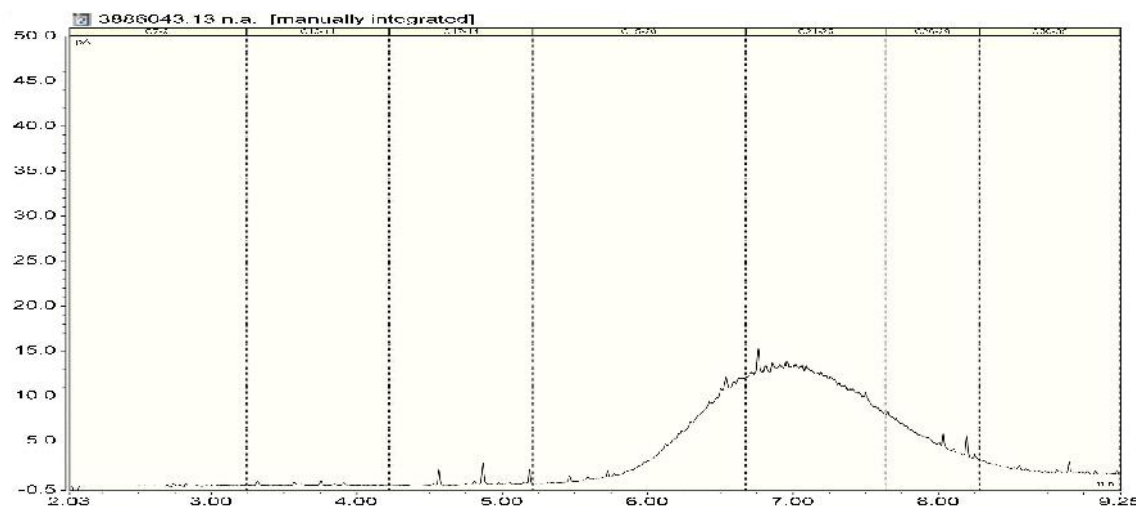
Client Chromatogram for TPH by FID



3886043.13

173P-Y9.1 12-May-2025 11:27 am

Client Chromatogram for TPH by FID

**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
Individual Tests			

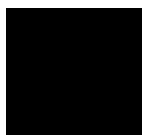
Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47-52
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	10, 13, 53-56
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45
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	1-14, 48-52
7 Heavy metals plus Boron	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 - 20 mg/kg dry wt	15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47
Organochlorine/nitro&phosphorus Pests Screen in Soils, GCMS	Sonication extraction, GC-ECD and GC-MS analysis. In-house based on US EPA 8081 and US EPA 8270.	0.010 - 0.2 mg/kg dry wt	53-56
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	10, 13
C7 - C9	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	10, 13
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	10, 13
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	10, 13
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	10, 13

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

Testing was completed between 13-May-2025 and 19-May-2025. 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.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix J – Soil Disposal Information

Table of Laboratory Results - Pound Rd Industrial Development, Christchurch - Disposal Information - Remediation Areas Only



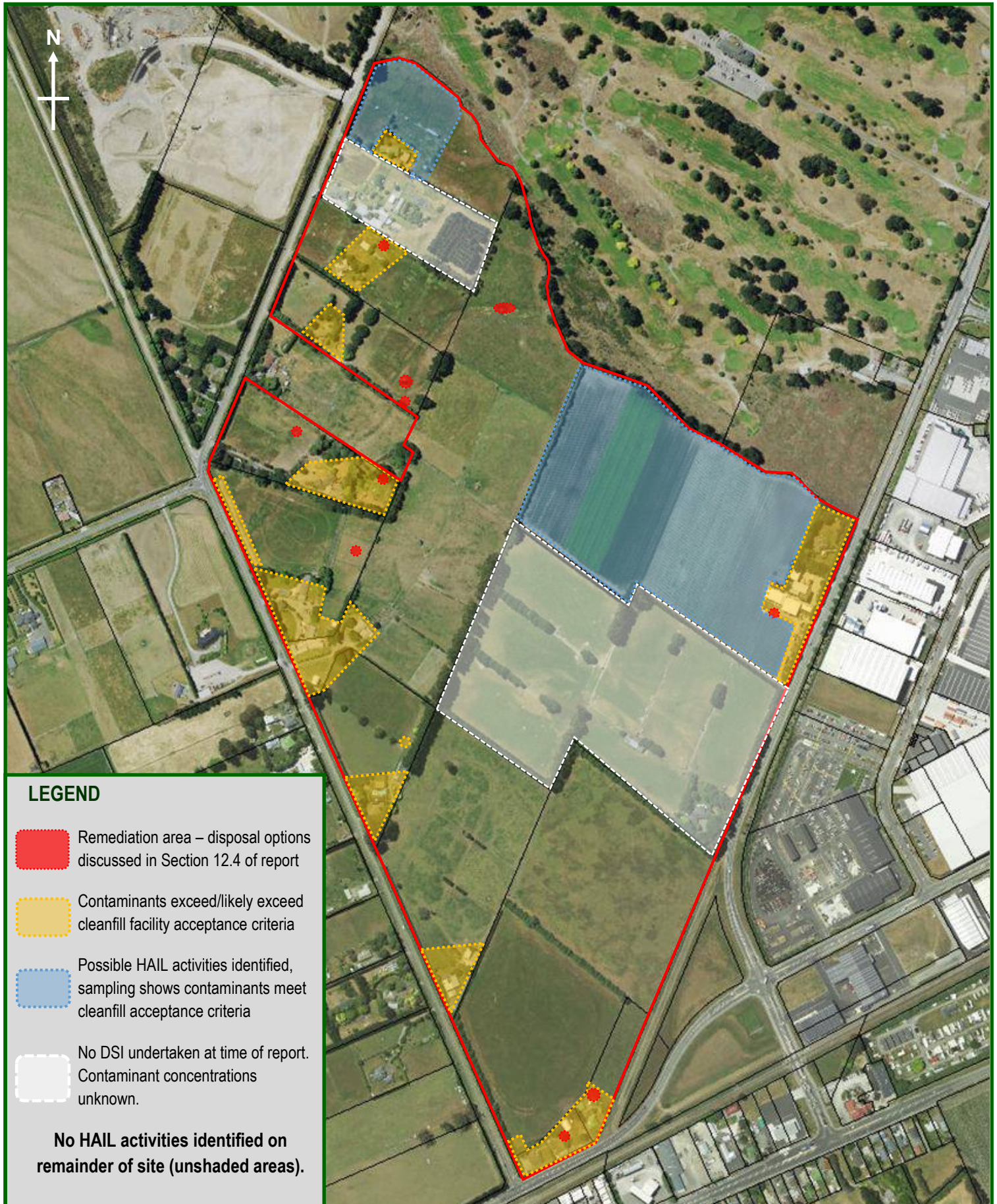
Remediation Area		173 Pound Rd Burn Area				173 Pound Rd - ASTs		578 Waterloo Rd - Burn Area						Waste Acceptance Criteria						
Sample Name:		173P-BP1.1	173P-BP1.2	173P-BP2.1	173P-BP2.2	173P-Y6.1	173P-Y9.1	578W-SS1.1	578W-SS1.2	578W-SS2.1	578W-SS2.2	578W-SS3.1	578W-SS4.1							
Soil Results	Depth (mm):	0-50	150	0-50	400	0-50	0-50	50	250	50	400	50	50	Class A Landfill (Kate Valley)	Burwood Landfill	Hororata Managed Fill	CESL (Temuka)	CESL (Taiko)	Wheatsheaf Quarry	Cleanfill ₁
	Lab Number:	3886043.1	3886043.2	3886043.3	3886043.4	3886043.10	3886043.13	3881839.1	3881839.2	3881839.3	3881839.4	3881839.5	3881839.6							
Heavy Metals																				
Arsenic	mg/kg	49	6	8	6	9	9	20	14	72	68	9	13	100	80	140	80	70	17	12.58
Boron	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	400	>10,000	130	1,600	10,000	>10,000	9
Cadmium	mg/kg	0.33	0.21	0.48	0.31	0.11	0.2	0.7	0.2	3.2	2.4	0.48	0.65	20	400	55	1,300	10	0.8	0.19
Chromium	mg/kg	55	25	32	27	14	18	18	18	137	88	17	21	100	2,700	375	6,000	150	290	22.70
Copper	mg/kg	74	12	31	19	22	16	24	15	114	101	24	27	100	>10,000	500	>10,000	280	>10,000	20.30
Lead	mg/kg	28	19	24	22	16.7	47	102	46	630	500	115	111	100	880	500	3,300	400	160	40.96
Nickel	mg/kg	17	15	19	19	9	10	14	14	18	15	12	18	200	600	2,000	6,000	320	400.00	20.70
Zinc	mg/kg	210	127	690	152	136	870	240	174	1000	780	250	450	200	14,000	1,800	400,000	-	7400	93.94
Total Petroleum Hydrocarbons in Soil																				
C7 - C9	mg/kg dry wt	-	-	-	-	340	< 20	-	-	-	-	-	-	BTEX and/or PAH analysis required to confirm acceptance	120	150	120	-	110	<LOD
C10 - C14	mg/kg dry wt	-	-	-	-	28,000	23	-	-	-	-	-	-		6,500	1,700	6,500	-	58	<LOD
C15 - C36	mg/kg dry wt	-	-	-	-	147,000	1,800	-	-	-	-	-	-		10,000	20,000	10,000	-	-	<LOD
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	-	-	175,000	1,830	-	-	-	-	-	-		-	-	-	6,500	-	<LOD

		2 Bartrs Rd - Ashy Soils	86 Bartrs Rd - Burn Area	94 Bartrs Rd - Burn Area	4 Hasketts Rd - Burn Areas		22 Hasketts Rd - Burn Area/Dumped Material		30 Hasketts Rd - Burn Area	Waste Acceptance Criteria						
Sample Name:		2B-SS5.1	BP1@50	BP2@50	4H-BP1	4H-BP2	22H-BP1	22H-BP3	30H-BP1							
Soil Results	Depth:	0-50	50	50	0-50	0-50	0-50	0-50	0-50	Class A Landfill (Kate Valley)	Burwood Landfill	Hororata Managed Fill	CESL (Temuka)	CESL (Taiko)	Wheatsheaf Quarry	Cleanfill ₁
	Lab Number:	3882100.20	3451017.87	3451017.88	3886043.51	3886043.52	3882100.9	3882100.11	3882100.8							
Heavy Metals																
Arsenic	mg/kg	13	69	179	147	21	154	1320	138	100	80	140	80	70	17	12.58
Cadmium	mg/kg	1.61	10.8	0.65	0.16	0.29	2.6	9	2.4	20	400	55	1,300	10	0.8	0.19
Chromium	mg/kg	34	90	111	64	19	115	610	87	100	2,700	375	6,000	150	290	22.70
Copper	mg/kg	120	5,900	380	89	61	250	3600	210	100	>10,000	500	>10,000	280	>10,000	20.30
Lead	mg/kg	1,230	600	59	17.3	20	98	360	186	100	880	500	3,300	400	160	40.96
Nickel	mg/kg	31	45	17	13	12	67	169	38	200	600	2,000	6,000	320	400	20.70
Zinc	mg/kg	920	1,850	950	240	750	1370	4600	830	200	14,000	1,800	400,000	-	7,400	93.94

Indicates result exceeds Class A Landfill (Kate Valley) Screening Criteria
Indicates result exceeds Burwood Landfill Acceptance Criteria
Indicates result exceeds Hororata Managed Fill Acceptance Criteria
Indicates result exceeds Wheatsheaf Quarry Acceptance Criteria
Indicates result exceeds Cleanfill Acceptance Criteria

References:

₁ Concentrations for 'Regional, Recent' soil group often used as acceptance criteria by cleanfill facilities from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007



Graphic scale is approximate only

0 80 160 240 320 400m

Disposal Option Plan

Pound Road Industrial Development, Christchurch

Date: 26 May 2025

Drawing No: 969/8



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Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only