



**Cherry Orchard
Development
Preliminary and Detailed
Site Investigation**

**Rippon Holdings Limited
and Rippon Investments
Limited**

March 2026



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Preliminary and Detailed Site Investigation

Document Status

Version	Purpose of Document	Prepared By	Reviewer	Review Date
0.1	Draft for internal review	S. Beardmore	F. Rowley	12/03/2026
0.2	Draft for client review	S. Beardmore	F. Rowley	12/03/2026
1.0	FINAL	S. Beardmore	F. Rowley	20/04/2026



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Executive Summary

Rippon Holdings Limited and Rippon Investments Limited are seeking consent to undertake a mixed residential development with associated retail and industrial zones on land located northwest of the Cromwell town centre. The site is currently an operational cherry orchard with associated infrastructure including irrigation ponds, buildings, frost fans, and orchard hubs.

This combined Preliminary and Detailed Site Investigation (PSI-DSI) was undertaken to characterise the presence and nature of contaminants in soil across the site and to assess potential risks to human health, ecological receptors, and the off-site environment. The investigation was completed to support consenting requirements under the Resource Management Act, including compliance with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESC).

The investigation comprised a detailed review of historical land use, ownership records, historic aerial imagery, regulatory databases, and previous investigation reports, together with a site inspection, targeted soil sampling and laboratory analysis. The sampling programme was designed to address contaminants commonly associated with horticultural activities, fuel storage, and workshops.

The site has a well documented land use history extending back to the late 1800s, with early pastoral farming followed by limited horticultural use from at least the 1950s. Large scale cherry orchard development occurred progressively from 2001 onwards, accompanied by typical ancillary horticultural activities such as pesticide storage and use, diesel-powered frost fans, and minor workshop activities. A small area of inert fill was identified within the accommodation block and was reported to contain non-hazardous materials.

Soil investigation results indicate that contaminants associated with orchard activities are present across the site, most notably copper and zinc from long-term spray use. Concentrations of contaminants were generally consistent with expectations for historic and current orchard land. Localised impacts associated with fuel handling and workshops were identified but are limited in extent. Persistent organochlorine pesticides were either not detected or detected at low concentrations. Overall,



contaminant concentrations do not pose a risk to human health under the proposed land uses.

The human health risk assessment concluded that soil contamination does not exceed the applicable standards under the NESCS. On this basis, widespread remediation is not required to protect human health, and the site is considered suitable for the proposed development from a human health perspective.

Ecological considerations are primarily associated with elevated copper concentrations in surface soils, which may affect soil organisms and plant growth in some areas. These effects are typical for long established orchard land and can be appropriately managed through soil handling, reuse strategies, and erosion and sediment controls during development.

Under the NESCS, the proposed land use change is considered a controlled activity. Soil disturbance may be undertaken as a permitted activity where regulatory thresholds and management controls are met; otherwise, soil disturbance will also require consent. From a regional planning perspective, the site is likely to be considered contaminated due to ecological guideline value exceedances, and earthworks for residential development are likely to require resource consent under the Regional Plan: Water and Regional Plan: Waste.

Surface soils across much of the site are not suitable for off-site disposal as cleanfill due to elevated copper concentrations, although deeper soils are likely to meet cleanfill criteria subject to confirmation through additional testing. Reuse of soils within the site is feasible, subject to appropriate management to address potential plant growth limitations.

Overall, the PSI–DSI demonstrates that the site is suitable for the proposed mixed use development, provided that appropriate soil management, erosion and sediment control measures, and targeted additional assessment are undertaken during detailed design and earthworks phases.



1 Introduction

1.1 Background and Purpose

Rippon Holdings Limited and Rippon Investments Limited are seeking consent to undertake a residential development with associated industrial and retail zones on a site located northwest of the Cromwell town centre.

The site is currently an operational cherry orchard featuring planted trees, two man-made irrigation ponds and buildings associated with the orchard. The proposed masterplan includes the development of approximately 755 lots, comprising a mix of large residential sections as well as medium and high-density housing.

Orchards can be associated with the storage and use of persistent pesticides, which are included on the Ministry for the Environment's Hazardous Activities and Industries List (HAIL). As a result, the proposed subdivision, land use change, and soil disturbance are subject to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

To help mitigate risks associated with contaminants in soil and address the requirements of the NESCS, Rippon Holdings Limited and Rippon Investments Limited engaged e3Scientific Limited (e3s) to undertake a combined Preliminary and Detailed Site Investigation (PSI-DSI). The purpose of the PSI-DSI is to characterise concentrations of contaminants in soil and assess risks to human health and the environment. The findings of the PSI-DSI will be used to inform an application under the Fast-track Approvals Act.

A summary of e3Scientific's experience in the provision of contaminated land services is provided in Appendix A.

1.2 Proposed Development

The proposed development includes approximately 755 lots, featuring a mix of large residential lots, low-density, and medium-density residential developments. A 8.29 ha zone is designated for commercial and industrial use at the southeastern end of the site along SH6.



Development of the site will require vegetation clearance, earthworks, and the installation of new infrastructure.

Detailed site layout or earthworks plans have not been provided; A masterplan for the proposed development is provided in Appendix B.

1.3 Scope of Work

The scope of work completed during the investigation included the following:

- Review of land use history from historic aerial photographs, certificates of title, Central Otago District Council (CODC) property files, and information available from the Otago Regional Council (ORC).
- Review of existing physical environment, including local geology, hydrology, and sensitive environment receptors.
- Completion of a site inspection.
- Development of a conceptual site model (CSM) identifying potential contaminant sources, the possible routes of exposure to contaminants of potential concern, and critical receptors.
- Development of a Sampling and Analysis Plan and collection of soil samples in accordance with Contaminated Land Management Guidelines (CLMG) No. 5: Site Investigation and Analysis of Soils to characterise the presence and concentration of contaminants that may be associated with the land use history of the site.
- Consideration of risks to human health, requirements for surplus soil disposal or re-use, the need for any further investigation, and the status of the development under the NESCS, Regional Plans, and other relevant regulatory requirements.
- Preparation of a Preliminary and Detailed Site Investigation report in accordance with the requirements of the CLMG No. 1: Reporting on Contaminated Sites in New Zealand (MfE, 2021 B).

1.4 Limitations

The findings of this report are based on the Scope of Work outlined above. e3Scientific Limited (e3s) performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made. Subject to the Scope of Work, e3s's assessment is limited strictly to identifying the risk to human health and the



environment based on the historical activities on the site. The confidence in the findings is limited by the Scope of Work.

The results of this assessment are based upon site inspections conducted by e3s personnel, information from interviews with people who have knowledge of site conditions and information provided in previous reports. All conclusions and recommendations regarding the properties are the professional opinions of e3s personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, e3s assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside e3s, or developments resulting from situations outside the scope of this project.

Observations and assessments of the site are relevant to the time of inspection and the scope of this assessment. Investigations were limited to the site investigation area. e3s notes that the continued operation of the site as an orchard could result in contamination that may alter the status of the site.



2 Site Location and Description

The site location and environmental setting are described in the following sections and summarised in Table 1.

2.1 Site Identification

The area under investigation (the site) is located at 16 and 64 Ripponvale Road, and 116 Kawarau Gorge Road (SH6), approximately 1.6 km west of the Cromwell town centre (Figure 1). The site also includes small portions of Section 97 Blk III Cromwell SD and Lot 1 - 5 DP 42009 (titles 476973, 476974, 476975) which are part of the neighbouring properties (Figure 2).

Central coordinates for the site are: E: 1298599 N: 5006002 (NZTM)

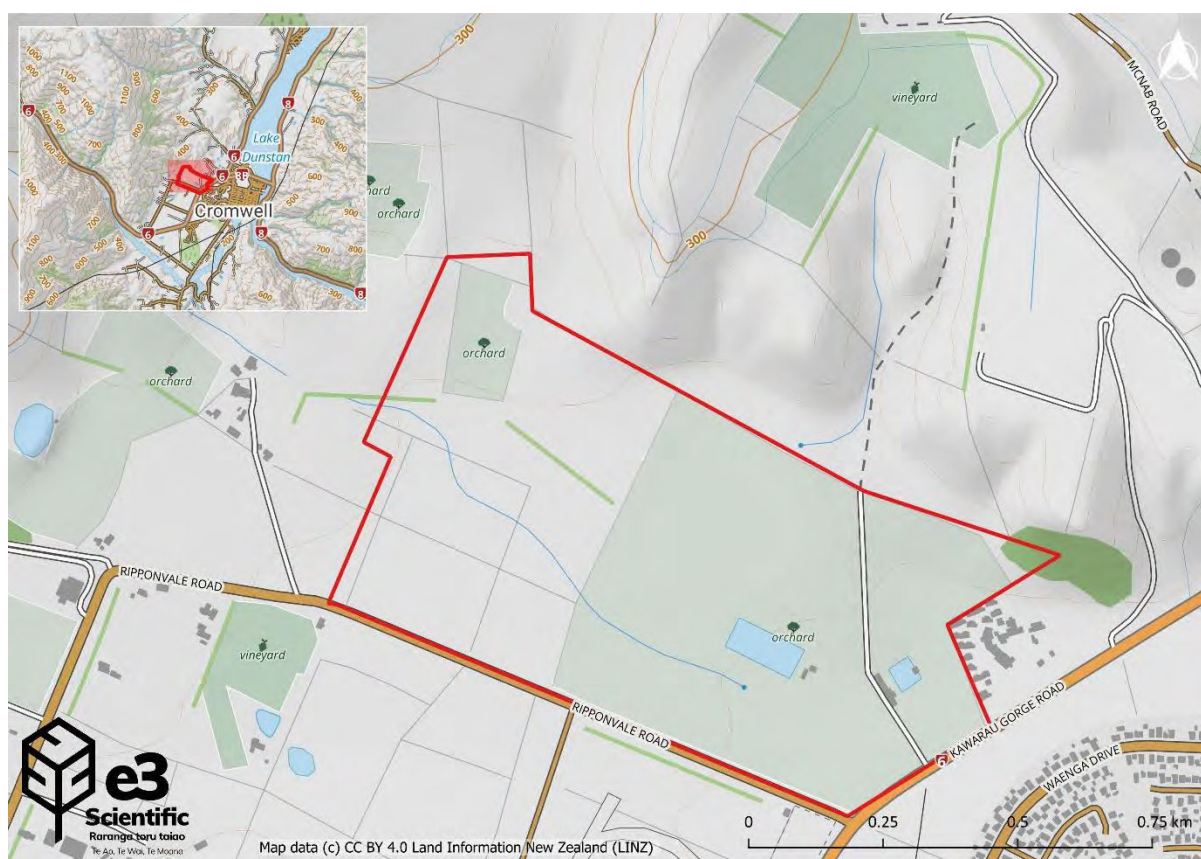


Figure 1: Site Location (topographic)





Figure 2: Site Location (aerial)

2.2 Current Use and Zoning

16 and 64 Ripponvale Road are zoned Rural Resource Area. 116 Kawarau Gorge Road is zoned rural residential in the operative district plan.

The site is currently an operational cherry orchard featuring planted trees, two man-made irrigation ponds, worker accommodation area and buildings associated with the orchard. A more detailed description of orchard operations is provided in Section 4.

2.3 Surrounding Uses

The site is surrounded by rural land to the north, the Ripponvale Rest Home and rural residential lots to the east, the Cromwell racecourse and aerodrome to the south, and the Shannon Farm residential development (currently under construction) to the west (Figure 2).



2.4 Topography

Elevation at the site ranges from 213 m to 240 m above sea level; it is generally flat with a gentle rise to the west and north.

2.5 Geology

Based on the 1:250,000 Geological Map of New Zealand, the site straddles three different geological units. The majority of the site is situated on Holocene river deposits described as loose, commonly angular, boulders, gravel, sand and silt forming alluvial fans. Approximately 1.6 ha near the southern boundary of the site is comprised of Middle Pleistocene river deposits, described as slightly to moderately weathered sandy gravel. 0.8 ha in the northwestern corner is situated on the Bannockburn and Dunstan Formation Neogene sedimentary rocks, described as sand and gravel with lignite seams, overlain by interbedded clay and silt (GNS Science, 2026).

As geological boundaries are not precise at this scale, one or more of the above geologies may be present within the site.

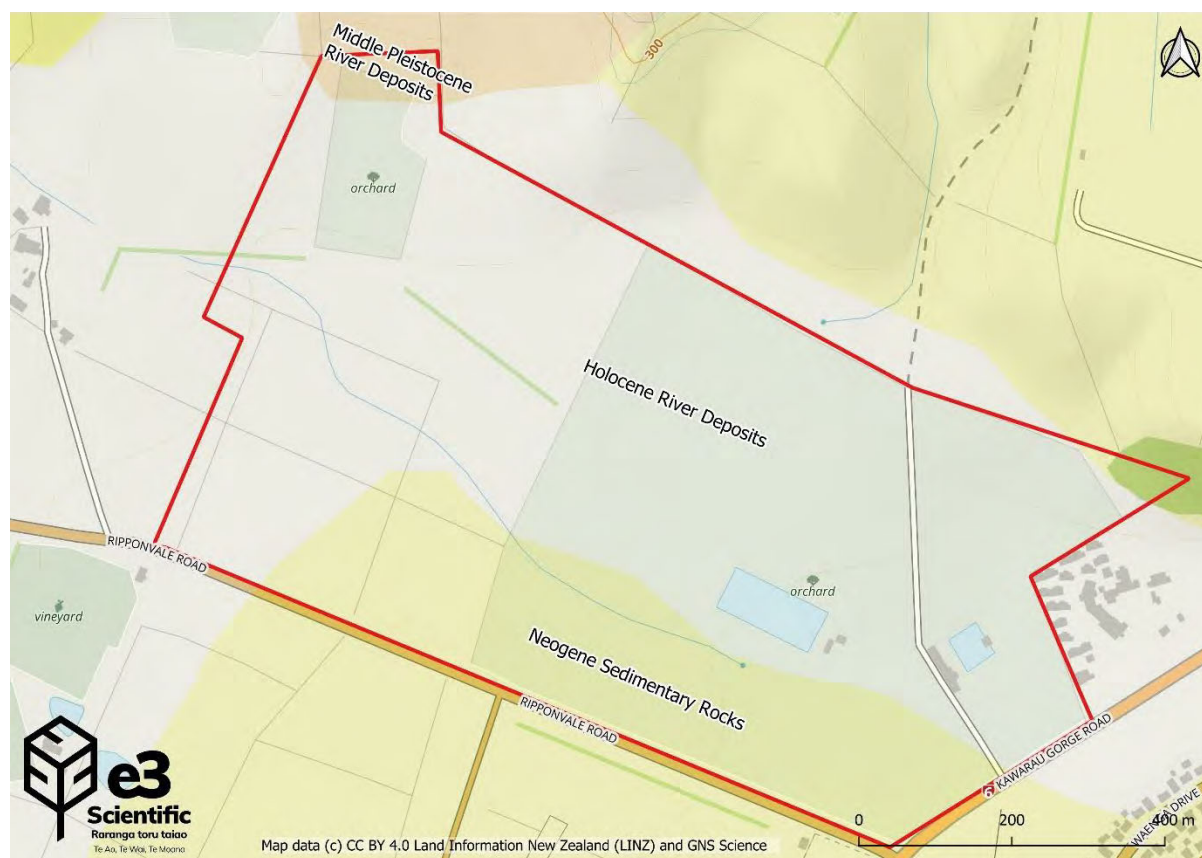


Figure 3: Published geology at the site



2.6 Hydrogeology

The site is located on the northern edge of the Cromwell Terrace Aquifer. The aquifer is a shallow, unconfined, outwash aquifer adjoining Lake Dunstan. The depth to water table ranges in the aquifer between 2 m and 34 m, with most variability due to terrace topography (ORC, 2012). Regionally, groundwater is expected to flow to the southeast towards the Kawarau and Clutha Mata-au Rivers, following a subdued reflection of local topographic gradients.

Based on the ORC's publicly available bore records, there are 14 existing wells within 1 km of the site (Figure 4). Primary recorded uses for these wells are irrigation (11), domestic supply (1), and groundwater monitoring (2).

There are three wells (F41/0253, F41/0255, and F41/0415) within the site boundary that are used for irrigation, and one well (F41/0247) used for groundwater monitoring. Recorded depth to water in these wells ranged from 24.3 to 34.1 metres below ground level (m bgl).



Figure 4: Existing wells within one kilometre of the site



2.7 Hydrology

There are two man-made irrigation ponds within the site, as well as a number of water races.

The nearest off-site surface water feature is a small unnamed tributary of the Kawarau River, approximately 780 m southwest of the site.

Table 1: Summary of Site Location and Description Information

Address	64 Ripponvale Road	16 Ripponvale Road	116 Kawarau Gorge Road
Titles	126180	182714 182715 182716 182717	476973 476974
Legal Description(s)	Lot 2 DP 330709 Sec 97 Blk III Cromwell SD Sec 98 Blk III Cromwell SD Sec 11 Blk III Cromwell SD Sec 4 Blk III Cromwell SD	Lots 1-4 DP 344529	Lot 1 DP 420009 Lot 2 DP 420009 Lot 3 DP 420009 Lot 1 DP 344529
Location	Ripponvale, Cromwell		
Coordinates	E: 1298599 N: 5006002 (NZTM)		
Owner(s)	New Zealand Cherry Corp (Leyser) LP	Rippon Holdings Limited & Rippon Investments Limited	Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald Infinity investment group
Site Area (total)	70.1 ha		
Surrounding Land Uses	North: Rural East: Retirement village South: Racecourse and aerodrome West: Shannon farm Residential Development		
Regulatory Authorities	Regional Authority: Otago Regional Council Local Authority: Dunedin City Council		
Zoning	Rural Resource		Rural Residential
Topography	Flat with a gentle rise to the west and north,		



Geology	Holocene river deposits, Middle Pleistocene river deposits, and Neogene sedimentary rocks,
Hydrogeology	Cromwell Terrace Aquifer
Nearest Surface Water	Unnamed tributary, approximately 780 m southwest of the site
Current Land Use	Orchard
Future Land Use	Mixed residential, commercial and industrial



3 Site History

3.1 Certificates of Title

The earliest available certificates of title for the site indicates that it was originally part of two larger rural properties.

The original certificates of title for 116 Kawarau Gorge Road (OT27/226 and OT204/76) were issued to the Vincent Hospital Board and the Superintendent of Otago in trust for hospital purposes. In 1991, this site was subdivided, separating the hospital (now the Ripponvale Rest Home) from the remainder of the property. In 2006, the property was transferred to the current owners, Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald, with further subdivisions in 2008 and 2009.

The western half of the site, covering 16 and 64 Ripponvale Road, was part of a wider rural property originally owned by James Ritchie, farmer of Cromwell. Ownership of the site was transferred several times between private individuals, including the Leyser brothers, Johannes and Trevor, who owned the property until 16 Ripponvale Road was transferred to the current owners, Rippon Holdings Limited and Rippon Investments Limited in 2005. 64 Ripponvale Road was transferred to New Zealand Cherry Corp (Leyser) LP in 2018.

In summary, certificates of title indicate that the site has largely been private ownership and used for rural purposes (farming and horticulture).

Historic surveys and certificates of title are provided in Appendix C and summarised in Table 2.



Table 2: Summary of certificates of title

Address	Titles			
116 Kawarau Gorge Road	476974 (2009)	402953 (2008)	OT13D/1013 (1991)	OT27/226 (1876)
	476973 (2009)		OT13D/1015 (1991)	OT204/76 (1924)
64 Ripponvale Road	126180 (2004)	OT7C/631 (1978)	OT7C/630 (1978)	OT432/8 (1961)
16 Ripponvale Road	182714 182715 182716 182717 (2004)	126179 (2004)	OT109/201 (1896)	

3.2 Historic Aerial Imagery and Maps

Aerial images were sourced from retrolens.co.nz, the National Library, and from Google Earth Pro. Online maps and survey plans of the area available from the 1800's to present day were sourced from mapspast.org.nz. The review of aerial photographs and maps was completed using digital copies of the images, which provide higher resolution than those provided in the appendix.

Summaries of notable observations are presented in Table 3 and Table 4. Selected images are included in Appendix D.



Table 3: Summary of Aerial Images

Date	Document Type	Observations
1950 ¹	Aerial photograph	- The majority of the site is covered in flood irrigated pasture. - A rectangular strip of orchard trees is present in the northwestern corner of the site. - An access track from Ripponvale Road bisects the site. At the end of the access road near the northern site boundary, there is a small outbuilding. The building is in the corner of rectangular fenced area. - Partway along this access track, there is a group of three rectangular features, which are likely stacks of hay bales.
1956 ¹	Oblique aerial photograph	- The eastern portion of the site is visible in this oblique aerial image looking from the south. - The visible portions of the site are undeveloped pasture.
1958 ¹	Aerial photograph	- Additional orchard trees have been planted in the northwestern corner of the site. - There is one, rather than three, rectangular features (hay bales) along the access track. - An irrigation pond has been constructed along the northern site boundary.
1962 ¹	Aerial photograph	- Only the southern portion of the site is visible in the image. - There are two areas of stacked haybales along an access track that runs east to west across the site. - A water race is visible running through the site.
1964 ¹	Aerial photograph	- Only the eastern side of the site is visible in the image. - There are no significant changes from the previous image.
1974 ¹ 1975 ¹ 1978 ¹ 1979 ¹ 1982 ¹ 1983 ¹ 1984 ¹ 1985 ¹	Aerial photograph	- From 1974, there is no longer a rectangular fenced area near the structure along the northern boundary at the end of the access track. - Otherwise, there are no significant changes from the previous images.



2001 ¹	Aerial photograph	- Orchard trees have been planted within 116 Kwarau Gorge Road. - The irrigation dam along the northern boundary of 116 Kwarau Gorge Road has been filled in. - An irrigation dam has also been constructed on this property.
2005-2011 ¹	Aerial photograph	- Nets have been placed over the trees within 116 Kwarau Gorge Road. - Orchard trees have been planted over the northern half of 16 Ripponvale Road. - An irrigation dam and small shed have also been constructed within 16 Ripponvale Road.
2013 ³	Satellite image	- Orchard trees have been planted over the remainder of 16 Ripponvale Road, and the orchard has been netted. - A long shed has been constructed on the western side of the irrigation pond on 116 Kwarau Gorge Road. - A second shed has been constructed near the irrigation pond on 16 Ripponvale Road.
2018 ⁴	Satellite image	There are no significant changes from the previous image.
2019 ⁴	Satellite image	- A small shed has been constructed on the eastern side of the irrigation pond on 116 Kwarau Gorge Road. - Development of the orchard within 64 Ripponvale Road is underway: shelter belts have been harvested, an access track and building platforms have been excavated, with surplus soil deposited into a bund along the northern boundary of the site.
2021 ⁴ 2022 ⁴	Satellite image	- There are no significant changes within 116 Kwarau Gorge Road or 16 Ripponvale Road. - The cherry orchard has been fully planted, and the building has been constructed within 64 Ripponvale Road. The worker accommodation area north of the building is visible.
2023 ⁴	Satellite image	- Three buildings have been constructed near the worker accommodation area. - Stockpiles of vegetation are visible within the worker accommodation area.

¹ Sourced from retrolens.co.nz and licensed by LINZ CC-BY 3.0

² Sourced from the Whites Aviation Collection, Alexander Turnbull Library, licensed by the CC-BY 4.0

³ Google Earth Pro © Planet.com

⁴ Google Earth Pro © Maxar Technologies



Table 4: Summary of Maps

Date	Document Type	Observations
1929 ¹ 1939 ¹ 1949 ¹	Survey plan	- The site includes part of sections 11, 31 and 55. And part of section 12 which is the hospital reserve. - A water race runs across the site from the northeast to the south.
1969 ¹ 1979 ¹ 1989 ¹	Topographic map	The site is shown at the foot of the Hospital Terraces. Some of the hospital buildings appear to be within the site boundary; however, this is not consistent with aerial images from the site time period.
1999 ¹	Topographic map	- The orchard in the northwest corner of the site is identified on the map. - The hospital buildings are shown in their accurate locations. - A water race is shown flowing from east to west across the site.
2009 ¹	Topographic map	Orchards are shown across all of 16 Ripponvale Road, and 116 Kawarau Gorge Road.
¹ Sourced from mapspast.org.nz which includes data licensed by LINZ for reuse under the CC-BY 3.0		

In summary, the majority of the site (except for a small stand of orchard trees in the northwest corner of the site, and a structure along the northern site boundary) was flood irrigated pasture until cherries were progressively planted over the site - in 2001 (116 Kawarau Gorge Road), 2005-2011 (northern half of 16 Ripponvale Road), 2013 (southern half of 116 Ripponvale Road), and 2021 (64 Ripponvale Road).

A small shed-like structure has been present near the northern boundary of the site from the earliest aerial imagery.

3.3 Ground Based Images

Streetview images of the site from Kwaru Gorge Road were available from Google Maps for multiple years between 2008 and 2025, and from Ripponvale Road between 2008 and 2019.

There are no significant changes visible from during this time, as much of the site is obscured from Kawarau Gorge Road by hedges.



3.4 Interviews

3.4.1 Client / Current Owner

Henry van der Velden, one of the owners of 116 Kawarau Gorge Road and director of New Zealand Cherry Corp (Leyser) GP Limited, was interviewed during the site walkover (described in Section 4) and provided representative spray diaries for the orchards.

A summary of the sprays used, and their active ingredients, is provided in Table 5. Copies of the spray records are available upon request.

Table 5: Sprays used at the cherry orchards

Spray	Type	Active Ingredient
Topas 200	Fungicide	Penconazole
Polaris 360	Herbicide	Glyphosate
Hi-Break	Growth Regulator	Cyanamide
ProTek	Fungicide	Carbendazim
Sumisclex + Captan	Fungicide	Dicarboximide
Belanty	Fungicide	Mefentrifluconazole
Aphidex	Insecticide	Pirimicarb
Calvary	Fungicide	Chlorothalonil
Folicur	Fungicide	Tebuconazole
Movento	Insecticide	Spirotetramat
Grocap	Fungicide	Dicarboximide
Ippon + Chief	Fungicide	Iprodione
Talent	Insecticide	Methoxyfenozide
Luna Sensation	Fungicide	Trifloxystrobin
Luna Sensation	Fungicide	Fluopyram
Entrust	Insecticide	Spinosad
Folicur	Fungicide	Tebuconazole
Pristine	Fungicide	Boscalid
Pristine	Fungicide	Pyraclostrobin
Pylon	Insecticide	Chlorfenapyr
Copper oxychloride	Fungicide and Bactericide	Copper
GA3	Growth regulator	Gibberellic acid
Nordox Copper + Trace-it Copper	Fungicide and insecticide	Copper oxide
Lokit	Spray drift retardant	Propionic acid, Potassium hydroxide, Polyoxyethylene monolaurate
Spray aid	Spray enhancer	Alkylaryl polyoxyethylene glycol phosphate
Moly / Molytrac	Fertiliser	Molybdenum
Zintrac	Fertiliser	Zinc
Bortrac	Fertiliser	Boron ethanolamine
Coplit-K	Fertiliser	Potassium
Prolific	Liquid foliar fertiliser	Nitrogen
Calcium	Fertiliser	Calcium
Brexil-Ca	Fertiliser	Calcium
Wuxal K40	Foliar fertiliser	Potassium
Waiken	Growth Regulator	Methyl Esters of Fatty Acids
Wetcat	Spray Enhancer	Alcohol ethoxylate



3.4.2 Contractor

Simon Crosbie of S&B Civil Limited was involved in the development of the orchard at 64 Ripponvale Road in 2019.

Simon confirmed that the bund formed along the northern boundary of the site in 2019 was comprised largely of surplus soils from the on-site works to form the access way and building platforms. Some of the material generated on site included tree stumps and concrete, but no other waste materials. He estimated that approximately 10% of the material used in the bund came from site scrapes at residential developments in Cromwell.

3.5 District Council Information

Information regarding any HAIL activities from the property files for the three properties was requested from the District Council on 26 January 2026. Supporting documentation is provided Appendix E.

The records search identified multiple consent documents relating to the orchard operations and advises that horticultural operations can be associated with HAIL category *A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds*.

The records search identified a building consent to install a new diesel boiler in 2006. This proposal included a small above-ground diesel tank, which can be considered part of category A17 of the HAIL. However, the building consent relates to a residential dwelling outside of the current footprint of the site.

The records search identified consent to erect wind machines for frost fighting. Wind machines are often powered by diesel engines and can be associated with category *A17: Storage tanks or drums for fuel, chemicals or liquid waste*.

Based on aerial imagery from 2025, the records search identified the storage of unknown materials around the sheds at 116 Kawarau Gorge Road and 16 Ripponvale Road. The report states that these materials may be associated with category *A2: Chemical manufacture, formulation or bulk storage*, as well as A10 and A17.

The NESCS records search for 64 Ripponvale Road identifies several HAIL activities, such as a sheep dip, fuel storage, and use of asbestos, but these are associated with



the western half of the property being subdivided as part of the Shannon Farm Development. The CODC provided Preliminary and Detailed Site Investigations for the Shannon Farm Development, which includes part of the current site, as well as a Detailed Site Investigation (DSI) that was completed for the worker accommodation area. These reports are discussed in further detail in Section 3.8.

3.6 Regional Council Information

Supporting documentation from the Regional Council is provided in Appendix F.

3.6.1 HAIL Register

The Otago Regional Council (ORC) maintains a database where information is held regarding the current or past land-uses that have the potential to contaminate land based on the Hazardous Activities and Industries List (HAIL). The database was accessed via the ORC mapping resource Hazardous Activities, Industries and Bores Search on 11 February 2026.

There are two identified HAIL polygons within the site boundary. The western part of the site is recorded as Verified HAIL under registration number HAIL.01974.01. The site was identified in the PSI completed for the Shannon Farm Developed (discussed in Section 3.8.1) as being associated with persistent pesticide use. This area was not investigated as part of the subsequent DSI.

The worker accommodation area is recorded as a verified HAIL under registration number HAIL.01974.02. The contamination status of the site is 'At or below background concentrations' based on the findings of the DSI completed in 2022. This report is discussed further in Section 3.8.3.

The ORC HAIL database notes that '*The database is continually under development and should not be regarded as a complete record of all properties in Otago. The absence of available information does not necessarily mean that the property is uncontaminated; rather no information exists on the database.*'

3.6.2 Resource Consents

There are three current consents associated with the site:

- RM13.375.01 – To construct a bore for the purpose of accessing groundwater.



- RM14.291.01 – To take and use groundwater for the purpose of irrigation, frost-fighting, stock water, domestic water and firefighting.
- RM25.093.01 – To take and use groundwater for the purpose of irrigation and frost fighting.

3.6.3 Environmental Incidents

Information regarding any environmental incidents at the site was requested from ORC on 20 January 2026.

The reply from ORC on 4 February identified two recorded environmental incidents:

- A breach of consent in 2018.
- An outdoor burning incident in 2024 where prohibited material was burned.

Based on subsequent discussion with ORC Senior Investigations Officer Mark Payne, these incidents occurred at the Shannon Farm development, west of the site.

3.7 Fire and Emergency New Zealand

Information regarding any hazardous substance emergencies, fires or fire training exercises at the site were requested from Fire and Emergency New Zealand (FENZ) on 19 January 2026.

FENZ advised on 3 February that they undertook a search for the past twenty years and identified one incident at the site, a vegetation fire on 7 December 2025 at Lot 2 DP 330709 (the lot that contains the worker accommodation area). There were no records of training exercises occurring at the site.

3.8 Previous Investigation Reports

Three previous investigation reports relating to the site were provided by the CODC and ORC. Copies of these reports are available upon request.

3.8.1 Shannon Farm PSI

In 2019, WSP-Opus completed a PSI of 144 Ripponvale Road. The investigation area included a portion of the current site. The purpose of the investigation was to assess the potential for contamination as part of a plan change and rezoning.



The PSI identified several HAIL activities associated with the Shannon Farm hub and wider property to the west of the subject site. Within the current site boundary, the only HAIL activity identified in the PSI was persistent pesticide use associated with orchards (Figure 5).



Figure 5: Alleged orchard locations adapted from the WSP-Opus PSI

The PSI identified five blocks of supposed orchard within the current site boundary. Estimated dates of planting in these blocks were 1982, 1984, 1984, 2015 and unknown (as shown in Figure 5).

However, based on the review of historic aerals described in Section 3.2, it is clear that the orchard block highlighted in yellow in Figure 5 was the only existing orchard within this part of the site, and it was planted in at least 1950, rather than 2015.

It may be that the authors of the PSI mistakenly interpreted the linear patterns of border-dyke flood irrigation in the historic aerial images as rows of trees.



3.8.2 Shannon Farm DSI

In 2019, WSP-Opus completed sampling and analysis throughout areas of identified HAIL activity where soil disturbance and land use change were proposed to occur as part of the Shannon Farm development.

No sampling was completed within the current site. Results from six areas of known or suspected orchard outside of the investigation area, are unlikely to provide an indication of contaminant conditions within the historic orchard in the northwest corner of the current investigation area because these trees were much older (at least 1950) than any of the other plantings.

3.8.3 Accommodation Area DSI

In 2019, WSP-Opus collected samples from part of the site as a condition of consent for changing the land use to worker accommodation.

10 samples were collected and analysed for heavy metals and organochlorine pesticides (OCPs) on the presumption that the site had been used for orchard activities. Based on the review of historic aerial imagery in Section 3.2, we know that this was not the case and it is not surprising that all results were at or below the expected natural background concentration for the site.

Table 6: Summary of heavy metal and OCP results from WSP-Opus (2022)

Contaminant	Minimum (mg/kg)	Maximum (mg/kg)
Arsenic	5	7
Cadmium	<0.1	0.18
Chromium	5	9
Copper	9	13
Lead	8.7	11.3
Nickel	7	10
Zinc	35	64
Total DDT	<0.07	<0.08
Dieldrin	<0.011	<0.013



4 Site Inspection

Suitably qualified and experienced e3s staff conducted a site walkover on 26 January 2026, accompanied by Henry van der Velden, one of the owners of 116 Kaurau Gorge Road and director of New Zealand Cherry Corp (Leyser) LP Limited. The site inspection was conducted in accordance with the Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (Revised 2021) (MfE, 2021 A).

Information gathered during site inspections included:

- General site condition, current use, local topography, and surrounding environmental setting.
- The condition of any buildings.
- The nature of the ground surface across the site.
- The location and condition of surface watercourses, drainage systems, and any groundwater wells.
- Visible signs of contamination or potential contamination, such as evidence of spills or leaks, surface staining, absent or stressed vegetation, and odours.
- Visible signs of areas of fill, stockpiled material, waste, ground disturbance, burnt areas, and former building foundations.
- The location of any chemical storage and transfer areas, bunding, waste storage areas, and discharges.
- The land use of neighbouring properties that have the potential to have an impact on the site or be affected by contamination from the site.
- The location of former buildings, processes or activities undertaken on the site.

There are six distinct areas of the site, as shown in Figure 6. Site features within these areas are described in the following sections. Site photographs and observations are provided in Appendix G.





Figure 6: Site Areas

4.1 NZCP Un-netted

The NZCP Un-netted extension block contains the newest cherry trees and was developed between 2019 and 2021.

There are no significant features within this area other than two pump sheds. A new pump shed on the western boundary of the site was constructed in the last year. It contains a new transformer, and storage tanks. Fertilisers, including calcium and magnesium, are added to irrigation water for fertilisation. There was no evidence of staining or other evidence of contamination in this area other than the absence of grass along the rows of plantings which may be a result of herbicide use.

There was no physical evidence of the historic orchard visible in the historic aerial images. Mr van der Velden said that these were apricots and removed at the time the new orchard was planted.



4.2 Accommodation Area

The accommodation block was developed in 2019 as part of the orchard expansion. The southern side of the accommodation block includes a large, corrugated iron shed that is used for storage, cooking and offices. Nets, crates, ladders, buckets and miscellaneous orchard equipment are stored inside and outside this area. There is no fuel or chemical storage in this area.

The accommodation area also includes three relocatable houses, portable toilets and a camping area for staff. There was no evidence of hazardous substance storage or use in this area.

The structure on the northern boundary of the site, first visible in the 1950 aerial image is a small concrete and unpainted corrugated iron shed. Along the northern boundary are also several stockpiles of pruned branches. A large burn pile, containing branches and wood from untreated timber pallets, is present in the middle of the site. A small pile of waste cherries was present near the western boundary of the accommodation area.

Mr van der Velden advised that a small farm landfill was present in the northwest corner of the accommodation block. This rubbish dump contained concrete, wire, waste cherries, tree stumps, and netting. It did not contain any hazardous materials or orchard sprays. The rubbish dump was covered with clean soil when the NZCP Un-netted block was developed in 2019.

4.3 NZCP Netted

The NZCP Netted block was planted in 2005, 2006, and 2007.

The NZCP Netted block contains four frost fans. These are powered by diesel engines and used seasonally to protect the cherries. Three of the frost fans are *Defenders* and one is a *Frost Boss C39*. These fans have self-bunded diesel fuel tanks, approximately 490 to 500 L in capacity. There was evidence of minor staining on the concrete and soil at the base of the frost fans, attributable drips of lubricating oil.

No grass was present within the dripline underneath trees, possibly as a result of herbicide use. Other than the frost fans, there are no notable features within the netted block.



4.4 NZCP Netted Hub

The hub for the NZCP Netted block contains an irrigation dam, two chemical storage sheds, one general storage shed, a spray mixing area adjacent to the chemical sheds, a workshop, and irrigation pumps. Two mobile fuel trailers were parked outside of the pump shed. The chemical storage sheds were in good condition, with solid concrete floors. Chemicals were stored in plastic tubs, and there was no evidence of spillage. The workshops and pump shed were in generally good condition, with some bulk storage of waste materials, such as netting and empty containers. A small electrical transformer is present near the workshop. The general storage shed was constructed of painted steel weatherboard and was likely relocated to the site from elsewhere.

There were isolated areas of oil staining ($<0.5 \text{ m}^2$) and some diesel staining beneath the dispenser the above ground tank. An intermediate bulk container (IBC) containing waste oil and a stack of empty oil containers was located behind one of the sheds; minor soil staining was apparent beneath these containers from drips of oil.

4.5 Judare Investment Block

The Judare Investment Block was developed in the early 2000s. There is a small pump shed near the entrance from Kowarau Gorge Road; otherwise, the remainder of this block is planted with cherry trees. As with other areas of planting, there is no grass beneath the rows of plantings.

4.6 Judare Hub

The Judare Hub includes a long shed along the site access way that is used for storage, accommodation and offices. There is no fuel or chemical storage in this area. On the opposite side of the irrigation dam, there is a workshop, two chemical storage sheds, and an above ground diesel tank.

The site and sheds were generally tidy, with only one minor patch ($<0.25 \text{ m}^2$) of visible oil staining adjacent to the workshop. There was some hydrocarbon sheen in the bunded area below the diesel tank, but this was contained within the bund.

There were two 44-gallon drums near the workshop that had been used for burning branches.





Figure 7: Site features



5 Summary of HAIL Activities

5.1 Identified HAIL Activities

The Ministry for the Environment's (MfE) Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that have the potential to cause land contamination resulting from hazardous substance use, storage, or disposal. The HAIL is intended to identify most situations in New Zealand where use and storage of hazardous substances could cause, and in some cases have caused, land contamination.

Based on a detailed review of site history and a site walkover, the site was originally part of larger rural properties used primarily for pastoral farming. Ownership dates to at least the late 1800s, with parcels held by the Vincent Hospital Board (hospital reserve area) and by private landowners such as James Ritchie in Cromwell.

From the 1950s through early 2000s, the majority of the site was flood irrigated pasture, with only a small orchard block in the northwest corner and a kill shed and yards along the northern site boundary. Beginning in 2001, the land was progressively converted to cherry orchards, with the Judare Block at 116 Kawarau Gorge Road planted in 2001, the NZCP Netted block at 16 Ripponvale Road between 2005–2013, and the NZCP Un-netted block at 64 Ripponvale Road in between 2019 and 2021. During the development of this block, a small farm landfill containing concrete, wire, waste cherries, tree stumps, and netting was covered. Ancillary activities associated with the orchard include the storage, mixing and use of pesticides and fuels, and minor workshop activities, including storage of waste oil, at the farm hubs.

Category A10 includes: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds. Although spray use at the historic apricot block is not known, use of persistent pesticides during the operational period of this orchard was widespread. Although many persistent pesticides were banned before the cherry orchards were planted in 2001, several modern pesticides in current use have a half-life (the time needed for a chemical to degrade to half of its initial concentration) greater than 6 months and are considered persistent pesticides, as defined by the United Nations Environment Program Secretariat of the Stockholm Convention on Persistent Organic Pollutants.



Table 7 below shows the persistence of the modern pesticides known to have been used at the cherry orchard.

Table 7: Half-lives of the pesticides used at the site

Spray	Type	Active Ingredient	Half-life (days) ¹	Persistence
Topas 200	Fungicide	Penconazole	90 (field)	Moderately persistent
Polaris 360	Herbicide	Glyphosate	6.45 (field)	Non-persistent
ProTek	Fungicide	Carbendazim	22 (field)	Non-persistent
Sumisclex + Captan	Fungicide	Dicarboximide	3.7 (field)	Non-persistent
Belanty	Fungicide	Mefentrifluconazole	200 (field)	Persistent
Aphidex	Insecticide	Pyrimicarb	9 days (field)	Non-persistent
Calvary	Fungicide	Chlorothalonil	17.9 (field)	Non-persistent
Folicur	Fungicide	Tebuconazole	47.1 (field)	Moderately persistent
Movento	Insecticide	Spirotetramat	0.7 9 (field)	Non-persistent
Grocap	Fungicide	Dicarboximide	3.7 (field)	Non-persistent
Ippon + Chief	Fungicide	Iprodione	11.7 (field)	Non-persistent
Talent	insecticide	Methoxyfenozide	68 (field)	Moderately persistent
Luna Sensation	Fungicide	Trifloxystrobin	1.69 (field)	Non-persistent
Luna Sensation	Fungicide	Fluopyram	118.8 (field)	Moderately persistent
Entrust	Insecticide	Spinosad	9-7 days (field) ²	Non-persistent
Folicur	Fungicide	Tebuconazole	47.1 (field)	Moderately persistent
Pristine	Fungicide	Boscalid	254 (field)	persistent
Pristine	Fungicide	Pyraclostrobin	33.3 (field)	Moderately persistent
Pylon	Insecticide	Chlorfenapyr	1.4 (typical)	Non-persistent
Copper oxychloride	Fungicide	Copper	Infinite	Persistent
Nordox Copper + Trace-it Copper	Fungicide and Insecticide	Copper	Infinite	Persistent

¹ Half-lives based on data provided by the University of Hertfordshire pesticide properties database: <https://sitem.herts.ac.uk/aeru/ppdb/en/>

² National Pesticide Information Center, Oregon State University Extension Services. <http://npic.orst.edu/factsheets/spinosadgen.html>

Yellow highlight indicates persistent pesticide

Three of the active ingredients known to have been used at the cherry orchard (mefentrifluconazole, boscalid, and copper) have half-lives greater than six months and are considered persistent.

The potential HAIL activities identified during this investigation and their dates of operation are summarised in Table 8.



Table 8: Identified HAIL Activities

HAIL Activity	Dates	Comment	Likelihood
A10. Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds	1950 - present (historic apricot orchard) 2000 – present (Judare) 2005 - present (NZCP netted) 2019 - present (NZCP un-netted)	150 m ² located within the south-eastern portion of the land parcel	Certain
A1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application	2011 – present (Judare Hub) 2011 - present (NZCP Netted Hub)	Mixing and formulation of sprays at the orchard hubs	Certain
A17. Storage tanks or drums for fuel, chemicals or liquid waste	2011 – present	Diesel storage at the orchard hubs and frost fans	Certain
F4. Motor vehicle workshops	2011-present	Minor workshop activities at the orchard hubs	Certain
G3. Landfill sites	2019 - 2019	A small area of fill is present within the accommodation block	Certain

5.2 Non-HAIL Activities

It is possible that shallow soils at the site contain residual cadmium concentrations associated with the historic application of superphosphate fertilisers during the use of the site for pastoral grazing. Available research suggests that the average concentration of cadmium in soils in the Otago and Southland Regions is approximately 0.2 mg/kg (MAF, 2008). It is also possible that shallow soils contain the organochlorine pesticide dichloro-diphenyl-trichloroethane (DDT), which was often added to superphosphate fertilisers to control grass grub and porina moth in pastoral grazing soils. Available research suggests that the average concentration of DDT in soils in provincial New Zealand is approximately 0.25 mg/kg (MWLR, 2015). These



findings are consistent with results from investigations completed by e3s throughout Otago and Southland. In all investigations of low-intensity pastoral grazing land, concentrations of cadmium and DDT have been orders of magnitude lower than applicable soil guideline values for human health or the environment. At this site, it is highly unlikely the broadacre application of fertiliser has occurred at a rate and intensity that would result in an accumulation of contaminants in concentrations that could present a risk to human health or the environment. As such, broadacre fertiliser use is not considered a HAIL activity.

Although the bund formed along the northern site boundary in 2019 may contain a small quantity of concrete or tree stumps, the majority of the material within the bund was sourced from on-site, and the balance (10%) from residential development in Cromwell, which is unlikely to have taken place on HAIL sites. As such, we do not consider the presence of the bund to be a HAIL activity under category G3: Landfill Sites.

The presence of the kill shed along the northern site boundary is also not considered to be a HAIL activity. The structure itself is constructed of corrugated iron and concrete, with no evidence of exterior paint which could contain lead. Although a small, fenced area is visible in early aerial images, this was likely a small set of yards for processing sheep prior to slaughter and is unlikely to be associated with livestock dip or spray race.

The burn piles observed within the accommodation only contained tree branches and pallets constructed of untreated timber. It is unlikely that these areas are a significant source of contamination and are not considered to be HAIL sites.

Although category E2 includes *Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment* the small, modern transformers present on site are not considered of sufficient scale or risk to be considered a HAIL activity.

Outside the areas identified in Section 5.1, it is more likely than not that no activities or industries listed on the HAIL have occurred. The approximate spatial extents of HAIL and non-HAIL areas are shown in Figure 8.



5.3 Integrity Assessment

Overall, the established site history spans a period of approximately 120 years and shows a transition from rural pasture to intensive orchard operations, accompanied by typical horticultural HAIL activities such as pesticide application, fuel storage for vehicles and frost fans, and minor on-site disposal of inert waste. Historical records, historic aerial images from 1950 to 2023 (with a maximum gap of 16 years between 1985 and 2001), interviews, and a site inspection collectively demonstrate a well-understood, largely agricultural land-use history with localised contamination sources consistent with orchard operations.

Minor areas of uncertainty include the spray regime at the historic apricot orchard, and the exact contents of the area of fill within the accommodation block.





Figure 8: Identified HAIL area



6 Preliminary Conceptual Site Model

A conceptual site model (CSM) for assessing site contamination provides an overview of the interaction between contaminants on site and potential receptors. Also referred to as the pollutant linkage model, the conceptual site model consists of three components (source-pathway-receptor), which if linked, indicate a risk may be present.

The following section sets out a preliminary conceptual site model. This preliminary conceptual site model is based on the collated information including an understanding of the possible contaminant sources, the possible routes of exposure to contaminants that may be present in soils on the site, and critical receptors.

6.1 Sources

A summary of the contaminants that may be associated with the land use history of the site is presented in Table 9. The contaminant list is based on site-specific observations, Appendix C of the NESCS User's Guide (MfE, 2012), and HAIL guidance from the MfE (2023).

Table 9: Contaminants of Potential Concern

Location	Potential Contaminants
Historic apricot orchard	Heavy metals, including arsenic, copper, lead and zinc. Organochlorine pesticides (OCPs), including DDT and dieldrin.
Cherry orchards	Heavy metals, particularly copper.
Frost fans	Heavy metals, particularly copper. Total Petroleum Hydrocarbons (TPH).
Orchard hubs	Heavy metals, particularly copper, lead, nickel and zinc. Total Petroleum Hydrocarbons (TPH).
Fill area	Heavy metals.

6.1.1 Historic Orchard

Based on the period of operation, potential contaminants associated with the older apricot orchard include the heavy metals arsenic, copper, lead and zinc. Arsenate



of lead was more commonly used on pip fruit than stone fruit from the 1920's onwards but cannot be ruled out. From the 1950s onwards, persistent organochlorine pesticides, including DDT and dieldrin, were widely used.

This area also overlaps with the current orchard activity, and the contaminants of potential concern in Section 6.1.2 are also relevant.

Contaminants of potential concern on this part of the site are most likely to be found in shallow soils due to their limited mobility, and they are likely to be relatively consistent across the area of application. Some mixing of shallow soils is likely to have taken place when the apricot trees were removed, and the cherry trees were planted.

6.1.2 Cherry Orchard

Inorganic elements, such as copper, persist indefinitely in soils, and have been shown to accumulate in orchard soil. Similarly, due to their long half-lives, residues of the modern fungicides mefenoxim, and boscalid may also be present in soils on site.

As with the historic orchard area, we would generally expect these contaminants to be relatively homogeneous in surficial soils throughout the areas of application.

6.1.3 Frost Fans

In addition to the contaminants of potential concern associated with the cherry orchard, localised contamination in the vicinity of the frost fans may include Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAHs) from minor spills and drips from fuelling the frost fans.

Any contamination would be very localised and likely shallow due to the mechanism of contamination (minor drips and spills).

6.1.4 Orchard Hubs

At both orchard hubs, storage and mixing of chemicals has the potential to cause high concentrations of localised contamination (hot spots) of pesticides. These areas are also used for fuel storage and minor work-shop activities, with visual observations indicating that localised diesel and oil drips and spills have occurred.



6.1.5 Landfill Area

Based on the information provided by the site owner, it is unlikely that area of fill contains a significant source of contamination. However, some waste items, such as galvanised metal fencing or treated timber, may contain heavy metals such as zinc, copper, chromium and arsenic. Based on the description of waste materials provided by the site owner, the presence of asbestos is unlikely.

Waste was reported to have been capped in 2019 prior to developing the area for worker accommodation. If present, any contaminants would be below the layer of capping material.

6.2 Receptors and Pathways

Based on the current use or foreseeable development of the site, potential receptors include:

- Construction workers involved in the development of the site.
- Adults and children living on the site.
- Nearby groundwater users.
- Off-site ecological receptors (i.e. aquatic ecology of unnamed tributary of Kowarau Arm and Lake Dunstan).
- On-site terrestrial receptors (i.e. soil microbes, invertebrates, plants, wildlife).

Exposure pathways for contaminants to these potential receptors include:

- Incidental ingestion of contaminated soil.
- Inhalation of volatile contaminants or contaminants entrained in dust.
- Dermal absorption of contaminants.
- Consumption of produce grown in soils on site.
- Erosion and migration of sediment to nearby surface water during earthworks.
- Migration of contaminated groundwater to nearby supply wells.

6.3 Preliminary Risk Assessment

The preliminary CSM described above is summarised in Table 10.

Based on this preliminary CSM, some pathways between contaminants in soil and receptors are potentially complete.



6.3.1 Incomplete Pathways

Although residues of the modern fungicides mefenoxazole, and boscalid may be present in soils on site, these contaminants have low toxicity to humans, with acceptable daily intakes of 0.035 and 0.06 milligrams per kilogram bodyweight per day, respectively (APVMA, 2004; NZ EPA, 2019). Based on the rate and frequency of application (as demonstrated in the spray records), it is highly unlikely that they would be present at concentrations (several thousand milligrams per kilograms of soil) that could pose a risk to human health. With respect to ecological receptors, the New Zealand Environmental Protection Agency has not established Environmental Exposure Limits (EELS) for either chemical on the basis that a qualitative assessment of these sprays found the level of risk of adverse effects to the environment to be negligible, with controls in place (NZ EPA, 2019; NZ EPA, 2022).

Copper is also likely to be present in soils through the current and historic orchard areas; however, copper has very low toxicity to humans, and the Soil Contaminant Standard (SCS) for residential land use is considerably greater than 10,000 mg/kg and is not considered limiting under the NESCS. It is therefore unlikely that there is a sufficient source on site with respect to human health.

Groundwater contamination as a result of orchard sprays, small-scale fuel storage, or the area of buried waste is also unlikely.

6.3.2 Potentially Complete Pathways

Heavy metals, such as arsenic and lead, may be present in soils around the workshop areas, the area of buried waste within the accommodation block, or historic orchard. It is possible that concentrations could pose a risk to human health.

Residues of OCPs may also be present within the historic orchard block in sufficient concentration to pose a risk to human health.

Based on visual observations, there is some minor localised contamination from storage and handling of diesel and oils near the workshops and potentially frost fans. Risks to human health and the environment are likely to be low, given the limited extent of contamination and relatively low mobility and toxicity of heavy C₁₀-C₃₆ hydrocarbons expected to be present.



Table 10: Preliminary Conceptual Site Model (CSM)

Source	Exposure Pathway	Possible Receptor	Pathway Linkage Assessment
Heavy metals Mefentricluconazole, and boscalid OCPs Hydrocarbons	Ingestion of contaminated soil	Future residents	Heavy Metals: Potentially Complete Although copper is unlikely to pose a risk to human health, other heavy metals such as arsenic and lead, may be present around workshop areas, historic orchard, or the small area of fill.
	Dermal contact with contaminated soil and dust		OCPs: Potentially Complete OCPs may be present within the historic orchard at sufficient concentrations to pose a risk to human health.
	Inhalation of contaminated dust		Mefentricluconazole, and boscalid: Incomplete These synthetic organic contaminants may be present in soils but are unlikely to be present in sufficient concentration to pose a risk to human health.
	Produce consumption		Hydrocarbons: Potentially Complete but low risk Contamination is expected to be localised around areas of fuel storage and comprised largely of heavy end C ₁₀ -C ₃₆ hydrocarbons from diesel and oils which have relatively low toxicity and mobility.
	Infiltration to groundwater and migration	Groundwater users	Incomplete – Groundwater contamination at horticultural sites is unlikely due to the relatively low contaminant concentrations and relative immobility.
		Aquatic Ecology of Lake Dunstan	
	Runoff/erosion/ and migration to surface water	Aquatic ecology of Lake Dunstan	Potentially complete but low risk– Migration of contaminants entrained in stormwater runoff is a potentially complete pathway if appropriate controls are not in place during bulk earthworks. However, based on the flat topography of the site and distance to the closest surface water receptor, risks are considered low.
	Direct and indirect exposure	Terrestrial ecological receptors	Potentially Complete Contaminants may be present in soil at concentrations that could adversely affect terrestrial biota.



7 Soil Sampling Strategy and Methodology

7.1 Investigation Objectives

The objectives of the investigation were to:

- Characterise the presence and concentration of contaminants of potential concern associated with the identified HAIL activities.
- Determine the risk of any soil contamination encountered on the site to human health based on a residential land use scenario.
- Determine appropriate options for excess soil should off-site disposal or reuse be required during future development.

7.2 Sampling and Analysis Plan

The sampling and analysis plan was designed to characterise contaminants in soils within the site. A summary of the sample locations and laboratory analyses is provided in Table 11.

7.2.1 Sample Locations

To characterise contaminants in soil, a stratified sampling approach was adopted. Six samples were collected systematically across each of the orchard areas (the historic apricot orchard, the NZCP netted and unnetted blocks, and the Judare block). Targeted samples were collected from the frost fans, chemical sheds, and workshops.

All samples were collected from surface soils (nominally 0.0 to 0.1 m below ground level (m bgl)). The shallow sampling depth was considered appropriate due to the nature of heavy metals and organochlorine pesticides, which generally bind strongly to soils and are typically highest in concentration within surface soils, and for TPH where the mechanism of contamination (small drips and spills) is unlikely to have significantly affected deeper soils.

Soil samples were not collected from areas of visible oil staining. These features are isolated, highly localised, and not representative of the wider investigation area; their inclusion would introduce bias and reduce the reliability of the site-wide assessment. The staining already exceeds aesthetic criteria based on visual inspection and will require removal or management irrespective of analytical results. In addition, the site



remains in active use, meaning the extent and location of any staining is likely to change between now and development. Sampling of visible oil staining does not provide a stable or meaningful basis for environmental characterisation.

Additionally, soil samples were not collected from the area of buried fill within the accommodation block. The material reported to be present (wire, stumps, concrete and similar debris) is characteristic of low-risk, largely non-putrescible fill. Based on the current master plan, the area will ultimately form part of a rear corner of a large residential lot where in-situ management would be an appropriate mitigation measure regardless of analytical results. As such, intrusive sampling of this zone would not alter the recommended management approach and was therefore not undertaken. This can be done in the future if required.

The rationale for sample locations is summarised in Table 11, and sample locations are shown in Figure 9. One duplicate sample was collected per 20 samples during the investigation.

7.2.2 Soil Sampling Methodology

Soil samples were collected using a stainless-steel trowel. Soil samples were transferred to 200 mL glass jars as supplied by ALS Laboratories.

The field QA/QC procedures performed during the soil sampling included the following:

- Field personnel wore a fresh pair of nitrile gloves between sampling events.
- Sampling equipment was cleaned and decontaminated between sampling locations using Decon 90.
- All samples were immediately placed in a cooled chilly bin, threads on the sampling jars were cleaned, and headspace was avoided to reduce the potential for loss of volatile organic compounds.
- All samples were labelled in a clear and durable manner, detailing sample name, project number, time and date of collection.
- Samples were transferred to the laboratory using signed chain of custody procedures.

The soil profiles were logged in general accordance with Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes (NZGS, 2005).



All soil samples were couriered to ALS Laboratories within two days of collection. TPH samples were stored in a fridge overnight while waiting for the courier. Chain of custody documentation is provided in Appendix I.

7.2.3 Analytical Parameters and Methods

All samples were analysed for heavy metals, including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc. Samples from the historic apricot orchard were also analysed for OCPs, and samples from near the frost fans and orchard hubs were analysed for TPH.

Laboratory analyses undertaken are summarised in Table 11.

ALS have IANZ accreditation for the analysis of heavy metals, OCPs, and TPH, and conduct internal QA/QC in accordance with IANZ requirements.

Laboratory analytical methods are detailed in the 'Summary of Methods' provided in Appendix I.



Table 11: Sample Location Rationale and Laboratory Analyses

Location	Sample ID	Analysis	Rationale
Former apricot orchard	SS01-SS06	Heavy metals OCPs	Characterise contamination associated with current and historic use of pesticides
NZCP Un-netted	SS07-SS12	Heavy metals	Characterise contamination associated with current use of pesticides
NZCP Netted	SS13-SS18	Heavy metals TPH (for sample locations adjacent to frost fans)	Characterise contamination associated with current use of pesticides and fuel storage at frost fans
NZCP Netted Hub	SS19-SS24	Heavy metals TPH	Characterise contamination associated with storage, use and mixing of pesticides and minor workshop activities
Judare	SS25-SS30	Heavy metals	Characterise contamination associated with current use of pesticides
Judare Hub	SS31-SS36	Heavy metals TPH	Characterise contamination associated with storage, use and mixing of pesticides and minor workshop activities





Figure 9: Sample Plan

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Project ID: 26011



7.3 Environmental Guideline Values

Soil guideline values selected for application on this project were adopted with reference to the Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values (MfE, 2011 B). Where available, New Zealand risk-based soil guideline values have been used. Where a NZ risk-based guideline is not available, international risk-based guideline values from Australia have been adopted.

7.3.1 Human Health

References for soil guideline values for the protection of human health are provided in Table 12.

Although some parts of the site will be used for less sensitive commercial/industrial and recreational land uses, guideline values for residential land use have been adopted for the entire site investigation to support an initial Tier 1 assessment of risk to human health.

For priority contaminants arsenic, cadmium, chromium, copper, lead, and DDT, Soil Contaminant Standards (SCSs) from the Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (MfE, 2011 A) were adopted in accordance with Regulation 7(2) of the NESCS.

For petroleum hydrocarbons, soil acceptance criteria were adopted from the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand Module 4 - Tier 1 Soil Screening Criteria (MfE, 2011 C).

For nickel and zinc, soil guideline values were adopted from the Australian National Environmental Protection Measure (Assessment of Site Contamination) (1999).



Table 12: References for Adopted Human Health Soil Guideline Values

Analysis	Guideline
Arsenic, cadmium, chromium, copper, lead, and DDT.	Soil Contaminant Standards (SCSs) in the Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (MfE, 2011 A)
Nickel and zinc	Health Investigation Levels (HILs) in the Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater in National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC, 2013)
TPH	Tier 1 Soil Screening Criteria (SSC) in the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand Module 4 (MfE, 2011 C)

7.3.2 Ecology

7.3.2.1 Off-site ecological receptors

Soil analytical results were compared to sediment quality guidelines from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018).

These values were used as a conservative measure to assess potential risk to aquatic organisms from erosion and sediment loss during construction phase activities. Results were compared to the upper guideline values which indicate a probable biological effect, but are considered conservative in this context as applied to in-situ soils rather than sediment within the freshwater or marine environment.

7.3.2.2 On-site ecological receptors

Manaaki Whenua Landcare Research (MWLR, 2023) has developed soil guideline values for the protection of terrestrial ecological receptors. These ecological soil guideline values (Eco-SGVs) are protective of a range of soil microbes, invertebrates, plants, wildlife and livestock.

For this assessment, the 60% species protection values were used. These values are derived to protect 60% of the ecological receptors from contaminant-related effects and are considered the concentration at which more than minor effects are likely to occur.



7.3.3 Background Concentrations

7.3.3.1 Heavy Metals

Estimates of naturally occurring concentrations of heavy metals were used to help identify possible impacts to soil and to assess suitability of disposal at local cleanfill facilities. Manaaki Whenua Landcare Research (MWLR, 2015) has developed a spatial database of predicted background concentrations (PBCs) which are based on the correlation between measured soil concentrations of heavy metals in a national data set and the underlying rock type. For each subgroup, the 95th percentile values are used to predict an upper estimate of the naturally occurring (or background) concentration of these heavy metals. Median natural background concentration of mercury was taken from GNS (2015).

These predicted background concentrations are not definitive, and regional variations in geology and site-specific conditions may affect local background concentrations. Data from the DSI completed by WSP-Opus (described in section 3.8.3) provide a good indication of the local background concentrations at the site.

7.3.3.2 Hydrocarbons

Although petroleum-derived hydrocarbons are generally rare in the natural environment, naturally occurring biogenic organic compounds (BOCs) can be present within soils, particularly when samples contain high amounts of organic matter. Organic compounds such as terpenes, fats, waxes, pectins, tannins, sterols, and resin can be present in organic material, and produce a positive response on Flame Ionisation Detector after laboratory extraction.

For the purpose of this investigation, concentrations of heavy fraction hydrocarbons (C15-C36) greater than 300 mg/kg are considered to be more likely a result of human influenced hydrocarbon impact, rather than BOCs.

7.3.3.3 Organochlorine Pesticides

Because organochlorine pesticides are man-made, any presence is technically above natural background. However, due to its widespread use, the organochlorine pesticide DDT can be found at low concentrations in soils throughout New Zealand. For example, as part of a study on ambient organochlorine concentrations, Ministry for the Environment (MfE, 1998) detected concentrations of DDT of up to 5.89 µg/kg (0.005 mg/kg) in pristine indigenous forests and grasslands, e.g. the Catlins Forest.



The ORC has adopted 0.35 mg/kg total DDT as an de minimis effects concentration with respect to cleanfill discharges and contaminated land assessment. All other OCPs should be below the screening level laboratory limit of reporting (ORC, 2026).

7.3.4 Soil Disposal

To support an assessment of off-site disposal routes for excavated soil should this be required, soil analytical results soil were compared to waste acceptance criteria (WAC) for Class 1 (Municipal Solid Waste Landfills) and Class 5 (Cleanfill) landfills from the Technical Guidelines for Disposal to Land (WasteMINZ, 2023), as well as landfill specific waste acceptance criteria for the SJ Timpany and Burnside (Dunedin) landfills.

7.3.4.1 Class 5 (Cleanfill) Landfills

Class 5 (Cleanfill) Landfills receive virgin excavated natural material (VENM), such as clay, soil and rock that are free of combustible, putrescible, degradable or leachable components.

WAC for Class 5 Landfills are based on naturally occurring background for heavy metals and organic contaminants. The WAC are the principal control on contaminant discharges to the environment, and stringent siting requirements to protect groundwater and surface water receptors are not required. Clean filling can generally take place on the existing natural or altered land without engineered environmental protection or the development of significant site infrastructure. However, surface water controls may be required to manage sediment runoff.

Background concentrations, as described in Section 7.3.3, were used to assess suitability for disposal or reuse as cleanfill.

7.3.4.2 Class 1 (Municipal Solid Waste) Landfill

A Class 1 Landfill is a site that accepts municipal solid waste (MSW), as well as C&D waste, some industrial wastes and contaminated soils. MSW contains biodegradable and leachable components that can result in the production of acidic leachate which can mobilise contaminants to a greater degree than non-MSW landfills.

The closest Class 1 (MSW) Landfill is the AB Lime Landfill, near Winton. Leachability limits for Class 1 Landfills are based on test results from the USEPA's Test Method 1311: Toxicity Characteristic Leaching Procedure (TCLP). The TCLP methodology simulates leaching in the mildly acidic environment of a municipal solid waste landfill, where putrescible and degradable organic matter generates acidic leachate. Soil samples are placed



into an extractor vessel with a buffered acetic acid solution and rotated for 16-20 hours. The fluid is then filtered from the soils, and total recoverable metals in the fluid are assessed using Inductively Coupled Plasma – Mass Spectrometry (ICP-MS). Although not published in the WasteMINZ (2023) guidelines, soil screening criteria based on 20 times the leachability limit can be used to determine whether leachability testing is necessary.

7.3.4.3 *Burnside and Timpany*

The SJ Timpany C&D Landfill in Otatara accepts contaminated soil based on Class B (MfE, 2004) WAC, which are similar to the Class 2 (Construction and Demolition Waste) criteria in Wasteminz (2023). The primary difference is that Class B WAC for inorganic contaminants (i.e., heavy metals) are half those of the Class 2 waste acceptance criteria.

The Burnside (Dunedin) Landfill has site-specific WAC based on the Class B (MfE, 2004) WAC.



8 Investigation Results

Soil sampling was completed on 23 and 25 February 2026. Weather conditions were fine on both days for sampling. There were no significant departures from the sampling and analysis plan.

8.1 Geological Profile

Soils throughout the orchard blocks were predominantly silty SAND. Some sample locations within the orchard contained more organic matter in a topsoil layer.

Soils within the orchard hubs were more variable, and included a mixture of silts, sands and gravels in variable proportions.

Descriptions of soil sample lithologies are provided in Appendix H.

8.2 Laboratory Analytical Results

The ALS Laboratories analysis reports are provided in Appendix I.

Laboratory results were received between 2 March and 4 March 2026. All laboratory data were checked for analytical and typographical errors or anomalies.

8.2.1 QA/QC Results

Laboratory QA/QC reports are provided in Appendix I.

All laboratory QA/QC checks were within the tolerances specified in ALS Laboratories accredited procedures.

Two duplicate soil samples were analysed to review the reproducibility of the soil sampling undertaken and laboratory analysis. The duplicate and corresponding sample analyses are presented in Table 13 and Table 14 below.

A relative percentage difference (RPD) of less than 30% was considered acceptable for this investigation (NEPC, 2013). For analytes detected close to the laboratory limit of reporting, a higher percentage difference is acceptable.



RPD for metals ranged from 0 to 21%. RPD for TPH was also very low, ranging from 0% to 9%. All OCPs were below the laboratory limit of reporting in both the original and duplicate samples. These duplicate sample results indicate that the sampling and laboratory methodology used for heavy metals (ICP-MS), hydrocarbons (GC-FID) and OCPs (GC-MS) were generally reproducible.

8.2.2 Heavy Metals

Heavy metal results are presented in Table 15.

Reported concentrations of arsenic, cadmium, chromium, nickel and mercury were within the range of expect background, and below the adopted human health and ecological soil guideline values.

The concentration of lead in one sample (SS23), collected near the painted steel weatherboard storage shed in the NZCP Netted Hub, exceeded the residential SCS. All other lead results were at or below the predicted background, indicating a localised exceedance of residential criteria in this area.

Elevated concentrations of copper were widespread through the site, with several sample results between 270 mg/kg and 1,570 mg/kg. While copper is not limiting for human health, these concentrations exceed the on-site ecological guideline value of 360 mg/kg, as well as the off-site ecological guideline value of 270 mg/kg, indicating potential for localised ecological effects that may require management.

Concentrations of zinc were also elevated (up to 535 mg/kg) in places, with several results above the off-site sediment guideline value (410 mg/kg). All results were below the on-site Eco-SGV (590 mg/kg) and criteria for residential land use (7,400 mg/kg).

Overall, the pattern is consistent with orchard operations which have resulted in the accumulation of copper and to a lesser extent zinc from long-term spray use and handling.

8.2.3 TPH

Total Petroleum Hydrocarbon (TPH) results are presented in Table 16.



All light (C₇-C₉) and middle (C₁₀-C₁₄) hydrocarbon fractions were below the laboratory limit of reporting. All C₁₀-C₁₄ results were below the criteria for surrogate as PAH in diesel.

Heavy end (C₁₅-C₃₆) hydrocarbon fractions were reported in all samples with concentrations up to 1,200 mg/kg. All results were below criteria for human health and on-site terrestrial ecological receptors. Three results exceeded the ANZG sediment guideline values which were adopted as the off-site ecological criteria.

Chromatograms from the samples typically displayed a broad, unresolved hump and a large late-eluting peak, which are typical of biogenic organic matter found in soil. These features indicate a complex mixture of humic and fulvic substances, plant waxes, and other decomposition products that do not form sharp, distinct peaks characteristic of hydrocarbon contamination. Although trace contamination from lubricating oils, waste oil, or diesel is possible, these do not appear to be dominant source of contamination in the samples.

8.2.4 Organochlorine Pesticides

All OCPs were below the laboratory limit of reporting, except for DDT in one of the six samples, which reported a total DDT value of 0.106 mg/kg, which is below the ORC ambient background value of 0.35 mg/kg.



Table 13: Relative Percentage Difference (Metals)

	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
SS02 (mg/kg)	9.83	0.098	11.7	76.5	15.8	<0.025	11.6	65.9
DUP01 (mg/kg)	9.99	0.119	12.5	81.9	16.5	<0.025	12.3	70.2
RPD (%)	2%	19%	7%	7%	4%	0%	6%	6%
SS13 (mg/kg)	9.03	0.237	13.7	1320	15.7	<0.025	11.4	413
DUP02 (mg/kg)	8.33	0.218	14.6	1310	17.5	0.031	10.5	424
RPD (%)	8%	8%	6%	1%	11%	21%	8%	8%

Table 14: Relative Percentage Difference (Hydrocarbons)

	C7-C9	C10-C14	C15-C36	C7-C36
SS13 (mg/kg)	<10.0	<15.0	1080	1080
DUP02 (mg/kg)	<10.0	<15.0	987	987
RPD (%)	0%	0%	9%	9%

Table 15: Heavy Metal Results (mg/kg)

Location	Sample ID	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Historic Orchard	SS01	0.0-0.1	12	0.128	12.1	104	20.8	<0.025	12.8	80.5
	SS02	0.0-0.1	9.83	0.098	11.7	76.5	15.8	<0.025	11.6	65.9
	SS03	0.0-0.1	7.85	0.170	8.63	171	15.7	<0.025	8.88	63
	SS04	0.0-0.1	8.56	0.141	10.5	113	16.2	<0.025	9.77	58.5
	SS05	0.0-0.1	8.06	0.161	9.04	189	16.9	0.025	9.32	73.3
	SS06	0.0-0.1	7.43	0.157	10.4	136	14.9	<0.025	8.82	56.8
NZCP Un-netted	SS07	0.0-0.1	10.8	0.230	15.7	59.6	15.5	<0.025	18.4	99.9
	SS08	0.0-0.1	6.47	0.168	8.82	28.8	11.4	<0.025	8.58	56.6
	SS09	0.0-0.1	13.3	0.192	16.9	39.6	16.4	<0.025	20.8	99.5
	SS10	0.0-0.1	10.9	0.166	15.3	56.6	15.2	<0.025	17.6	94.1
	SS11	0.0-0.1	12.4	0.196	16.4	43.6	16.8	<0.025	17.6	84.7
	SS12	0.0-0.1	12.9	0.244	18.6	30.9	18.4	<0.025	21.8	90.2
NZCP Netted	SS13	0.0-0.1	9.03	0.237	13.7	1320	15.7	<0.025	11.4	413
	SS14	0.0-0.1	6.33	0.192	11.9	145	12.1	<0.025	8.7	85
	SS15	0.0-0.1	6.61	0.171	9.49	348	12.6	<0.025	11.9	115
	SS16	0.0-0.1	6.77	0.210	9.90	1030	12.2	<0.025	9.21	330
	SS17	0.0-0.1	7.72	0.180	13.1	378	12.7	<0.025	9.12	109
	SS18	0.0-0.1	7.52	0.251	10.5	608	14.2	<0.025	10.5	206
NZCP Netted Hub	SS19	0.0-0.1	4.31	0.051	9.36	91	21.0	<0.025	8.24	184
	SS20	0.0-0.1	7.43	0.090	18.9	1570	24.6	<0.025	12.6	535
	SS21	0.0-0.1	4.84	0.045	12.3	239	16.4	<0.025	8.17	112
	SS22	0.0-0.1	6.45	0.127	18.6	343	21.2	<0.025	11.6	415
	SS23	0.0-0.1	7.77	0.099	12.9	413	408	<0.025	11.8	246
	SS24	0.0-0.1	4.43	0.081	9.84	296	12.1	<0.025	7.16	473
Judare	SS25	0.0-0.1	5.99	0.082	8.21	529	11.6	<0.025	8.95	155
	SS26	0.0-0.1	7.88	0.069	8.20	85.7	13.5	<0.025	9.55	63.7
	SS27	0.0-0.1	5.41	0.149	8.82	814	11.2	<0.025	10.7	257
	SS28	0.0-0.1	8.49	0.087	9.17	156	16.6	<0.025	10.3	95
	SS29	0.0-0.1	6.57	0.105	7.99	1520	12.6	<0.025	9.42	330
	SS30	0.0-0.1	5.70	0.075	6.97	1510	9.83	<0.025	7.49	338
Judare Hub	SS31	0.0-0.1	5.14	0.100	8.72	512	13.4	<0.025	8.29	202
	SS32	0.0-0.1	10.4	0.072	10.3	220	15.3	<0.025	11.6	87.3
	SS33	0.0-0.1	4.95	0.068	6.85	99.7	15.2	<0.025	7.13	81.5
	SS34	0.0-0.1	18.5	0.078	12.0	177	19.9	0.026	13.1	116
	SS35	0.0-0.1	6.05	0.043	8.43	85.1	17.5	<0.025	9.09	58.2
	SS36	0.0-0.1	7.72	0.089	8.65	418	15.7	0.032	10.8	151
Human Health (Standard Residential)			20 ¹	3 ¹	460 ¹	No Limit ¹	210 ¹	310 ¹	400 ²	7,400 ²
Off-site Ecological Criteria (ANZG sediment guideline)			70 ³	10 ³	370 ³	270 ³	220 ³	1.0 ³	52 ³	410 ³
On-site Ecological Criteria (MWLR eco-SGVs)			160 ⁴	35 ⁴	720 ⁴	360 ⁴	2500 ⁴	-	-	590 ⁴
Predicted Background Concentrations			12.06 ⁵	0.34 ⁵	80.15 ⁵	42.85 ⁵	44.34 ⁵	0.062 ⁶	44.96 ⁵	182.8 ⁵

¹ Soil Contaminant Standard. Chromium concentration based on Chromium VI. (MfE, 2011 A).² Health Investigation Level (NEPC, 2013).³ Sediment Toxicant Default Guideline Value – High (ANZG, 2018).⁴ 60% species protection Eco-SGV, sensitive soil (MWLR, 2023).⁵ Predicted background soil concentrations - 95%ile values for gravel (MWLR, 2015)⁶ Median concentration (GNS, 2015).

< Denotes concentration is below laboratory detection limit.

Light green shading denotes predicted background soil concentration exceedance.

Orange shading denotes human health exceedance.

Bold denotes exceedance of the off-site ecological criteria.

Red denotes exceedance of the on-site ecological criteria.



Table 16: TPH Results (mg/kg)

Location	Sample ID	Depth (m)	Soil Type	C ₇ -C ₉	C ₁₀ -C ₁₄	C ₁₅ -C ₃₆	C ₇ -C ₃₆
Frost Fans	SS13	0.0-0.1	silty SAND [sand]	<10.0	<15.0	1080	1080
	SS14	0.0-0.1	silty SAND [sand]	<10.0	<15.0	87.2	87.2
	SS15	0.0-0.1	silty SAND [sand]	<10.0	<15.0	177	177
	SS17	0.0-0.1	silty SAND [sand]	<10.0	<15.0	106	106
NZCP Netted Hub	SS19	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	250	250
	SS20	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	219	219
	SS21	0.0-0.1	sandy	<10.0	<15.0	199	199
	SS22	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	1200	1200
	SS23	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	465	465
	SS24	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	417	417
Judare Hub	SS31	0.0-0.1	sandy GRAVEL [sand]	<10.0	<15.0	399	399
	SS32	0.0-0.1	gravelly SILT [sandy SILT]	<10.0	<15.0	184	184
	SS33	0.0-0.1	gravelly SAND [sand]	<10.0	<15.0	337	337
	SS34	0.0-0.1	silty SAND with some gravel [sand]	<10.0	<15.0	83.5	83.5
	SS35	0.0-0.1	gravelly SAND [sand]	<10.0	<15.0	52.6	52.6
	SS36	0.0-0.1	sandy SILT [sandy SILT]	<10.0	<15.0	622	622
Human Health - Residential All-pathways (SAND, <1 m) ¹				120 (m)	470 (x)	NA	-
Human Health - Residential All-pathways (sandy SILT, <1 m) ¹				500 (m)	(510) (x)	NA	-
Off-site Ecological Criteria (ANZG sediment guideline) ²				-	-	-	550
On-site Ecological Criteria (MWLR eco-SGVs) ³				170	140	1,700	-
Estimated Background Concentration ³				< LOR	< LOR	300	300

¹ Tier 1 Soil Acceptance Criteria (MfE, 2011 C).

² Predicted background soil concentrations - 95%ile value for rural areas (MWLR, 2024).

³ Estimated contribution from Biogenic Organic Compounds, see Section 7.3.3.

NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix.

Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons.

Superscript denotes the limiting pathway - (m) maintenance/excavation, (x) TPH as a surrogate for PAHs

< Denotes concentration is below laboratory limit of reporting.

Light green shading denotes background soil concentration exceedance.

Bold denotes exceedance of the off-site ecological criteria.

Red denotes exceedance of the on-site ecological criteria.



9 Revised Conceptual Site Model

9.1 Characteristics of Contamination

Based on the sampling analysis completed, concentrations of copper and zinc are elevated in surface soils throughout the former orchard area, while TPH and lead are more localised.

9.1.1 Copper

Concentrations of copper in shallow soils shows clear contribution current and historic orchard operations. Concentrations are lowest within the NZCP Un-netted Block, the most recently developed orchard. Within the NZCP Un-netted block, the area of historic apricots has slightly elevated concentrations, indicating historic applications of copper. The highest concentrations are found in the NZCP and Judare blocks, along with the orchard hubs. Copper concentrations are generally proportional to the duration of the orchard activity within each location.

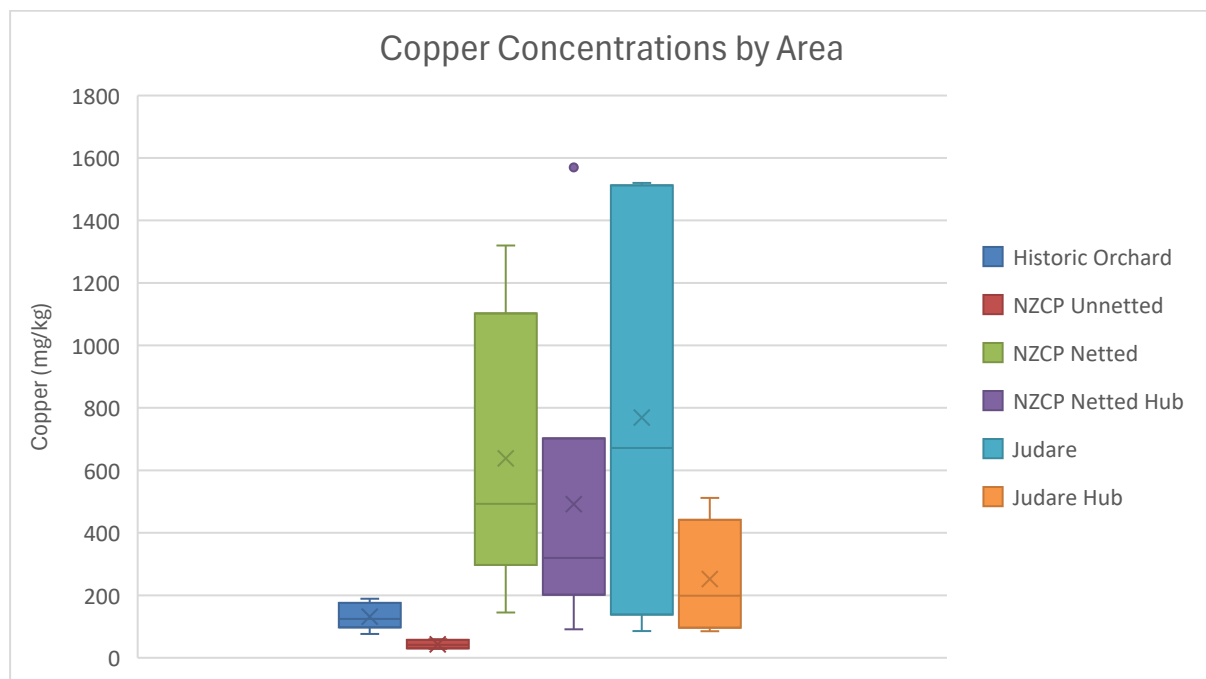


Figure 10: Box and whisker plot of copper concentrations

The vertical profile of copper concentrations has not been delineated. Generally, we would expect concentrations to decrease within the top 20 to 30 cm of the soil profile, particularly where high organic matter is present.



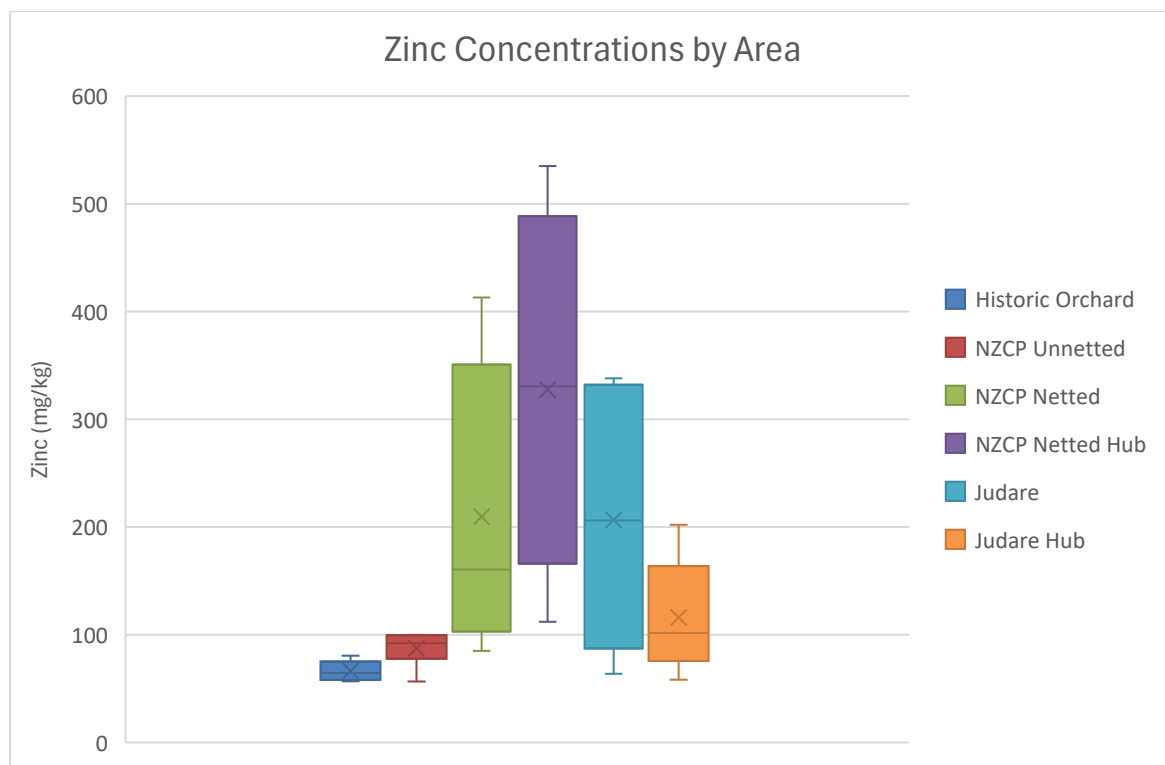


Figure 11: Copper results



9.1.2 Zinc

Concentrations of zinc were generally within the range of expected background at the NZCP Un-Netted, Historic Orchard, and Judare Hub sampling areas. Higher concentrations, including concentrations that exceed criteria for off-site ecological receptors, are present in the Judare, NZCP Netted, and NZCP Netted Hub sampling areas.



As with copper, concentrations of zinc have not been delineated vertically through the soil profile. Although zinc is typically more soluble than other heavy metals, the concentrations reported on site are not significantly elevated and not expected to extend to deeper soils.

9.1.3 Total Petroleum Hydrocarbons

In isolated and localised areas of visible staining, TPH is expected to be elevated. Elsewhere in the orchard hubs and near frost fans, there may be some contribution to TPH from diesel, waste oil, or lubricating oil, but chromatograms suggest that biogenic organic matter is largely responsible for these elevated results.



9.1.4 Lead

One sample exceeded the Residential SCS for lead. This sample location was relatively close to the painted steel weatherboard shed within the NZCP Netted Hub. It is possible that this elevated result is associated with the lead-based paints used on the shed, which was likely repurposed from elsewhere. Based on the other sample results, the spatial extent of the exceedance appears to be relatively limited and is likely confined to a 1.5 m to 2 m halo around the shed. Under the current masterplan, this area will be part of the retail and industrial zone rather than residential, and the result was well below the Commercial Industrial Outdoor Worker SCS of 3,300 mg/kg.

9.2 Revised Risk Assessment

An assessment of the risk to human health considers the concentration of contaminants present, the characteristic of people using the site and pathways of exposure.

9.2.1 Human Health

All results are below the applicable criteria for the proposed land use.

As no samples were collected from the area of fill within the accommodation block, we could conservatively assume that contaminants within this part of the site could pose a risk to human health, but this risk can be readily managed by taking measures to ensure that fill material is not inadvertently exposed during development or future use. Should future disturbance be required, additional sampling or precautionary removal could be completed. Although the presence of asbestos containing materials (ACM) is low, we would recommend that contractors undertaking the excavation have an accidental discovery protocol in place.

9.2.2 Ecological

9.2.2.1 Off-site Ecological Receptors

Although concentrations of copper, and to lesser extent TPH and zinc, exceed the ANZG sediment guideline values, the risk of off-site mobilisation of sediment is relatively low, given the flat topography of the site, permeability of site soils, and distance to the nearest sensitive surface and water.



Nonetheless, these exceedances highlight the importance of ensuring robust erosion and sediment management is in place during earthworks.

9.2.2.2 *On-site Ecological Receptors*

Concentrations of copper exceed the adopted soil guideline values for terrestrial ecological receptors (including soil microbes, plants, and wildlife) in many samples throughout the site.

The high concentrations of copper found on site could inhibit plant growth in future residential settings, such as gardens and lawns.



Table 17: Revised Conceptual Site Model

Source	Exposure Pathway	Possible Receptor	Pathway Linkage Assessment
Heavy metals Mefentricluconazole, and boscalid OCPs Hydrocarbons	Ingestion of contaminated soil	Future residents	Heavy Metals: Complete but low risk All samples are below the adopted soil guideline values for human health. The area of inert fill has not been investigated but exposure is unlikely to be complete.
	Dermal contact with contaminated soil and dust		OCPs: Incomplete OCPs are not at sufficient concentrations to pose a risk to human health.
	Inhalation of contaminated dust		Mefentricluconazole, and boscalid: Incomplete These synthetic organic contaminants may be present in soils but are unlikely to be present in sufficient concentration to pose a risk to human health
	Produce consumption		Hydrocarbons: Potentially Complete but low risk Contamination is expected to be localised around areas of fuel storage and comprised largely of heavy end C10-C36 hydrocarbons from diesel and oils which have relatively low toxicity and mobility.
	Infiltration to groundwater and migration	Groundwater users	Incomplete – Groundwater contamination at horticultural sites is unlikely due to the relatively low contaminant concentrations and relative immobility.
		Aquatic Ecology of Lake Dunstan	
	Runoff/erosion/ and migration to surface water	Aquatic ecology of Lake Dunstan	Potentially complete but low risk– Copper, zinc and TPH exceed the ANZG sediment guideline values; however, based on the flat topography of the site, permeable nature of the soils, and distance to the closest surface water receptor, risks are considered low.
	Direct and indirect exposure	Terrestrial ecological receptors	Complete: Copper is present in soil at concentrations that could adversely affect terrestrial biota.



10 Regulatory Status

10.1 NESCS

10.1.1 Land Use Change and Subdivision

Based on the sampling and analysis completed, contaminants are not present in soil in sufficient concentrations to pose a risk to human health.

We therefore consider the proposed land use change would be a controlled activity under Regulation 9.

10.1.2 Soil Disturbance

Regulation 8(3) states that disturbing the soil of the piece of land is a permitted activity provided the following requirements are met:

- a) Controls to minimise the exposure of humans to mobilised contaminants must:
 - i) be in place when the activity begins.
 - ii) be effective while the activity is done.
 - iii) be effective until the soil is reinstated to an erosion-resistant state.
- b) The soil must be reinstated to an erosion-resistant state within 1 month after the serving of the purpose for which the activity was done.
- c) The volume of the disturbance of the soil of the piece of land must be no more than 25 m³ per 500 m².
- d) Soil must not be taken away in the course of the activity, except that,—
 - i) For the purpose of laboratory analysis, any amount of soil may be taken away as samples.
 - ii) For all other purposes combined, a maximum of 5 m³ per 500 m² of soil may be taken away per year.
- e) Soil taken away in the course of the activity must be disposed of at a facility authorised to receive soil of that kind:
- f) The duration of the activity must be no longer than 2 months:
- g) The integrity of a structure designed to contain contaminated soil or other contaminated materials must not be compromised.

Based on the area of the site of 701,000 m², a maximum of 35,050 m³ could be disturbed over this area, and 7,010 m³ can be removed in any one year. If disturbance



occurs only part of the site, the thresholds for disturbance and removal would be proportionally less.

Any soil disturbance or removal that does not meet the permitted activity criteria outlined in Regulation 8(3) would be a controlled activity under Regulation 9.

10.2 Regional Plans

10.2.1 Regional Plan: Waste for Otago

The Regional Plan: Waste for Otago defines a contaminated site as a site at which hazardous substances occur at concentrations above background levels and where assessment indicates it poses or is likely to pose an immediate or long-term hazard to human health or the environment.

In practice, the criteria for determining whether a site is 'contaminated' vary from site to site. The criteria for a given site will be established using a source-pathway-receptor conceptual site model that takes into account:

- The hazardous substances found;
- The media (soil, air, water) in which the substances occur;
- The naturally occurring background concentrations in the area;
- The pathways of potential human health or ecological exposure;
- The current or proposed use of the site;
- The nature of sensitive receptors that may be exposed to contaminants at or near the site.

In this case, based on the conceptual site model outlined in Section 9, we would consider the site to be contaminated due to the high concentrations of copper that exceed applicable criteria for the protection of terrestrial ecological receptors.

10.2.2 Regional Plan: Water for Otago

Rule 14.5.1.1 of the Regional Plan: Water for Otago allows the use of land, and the associated discharge of sediment into water or onto or into land where it may enter water, for earthworks for residential development as a permitted activity, provided, amongst other things, that earthworks do not occur on contaminated or potentially contaminated land.



While we have not assessed the planning status of all the requirements of this rule, we can confirm that the area of proposed residential development would be considered contaminated and consent for residential earthworks is likely to be required.



11 Disposal or Reuse of Soil

11.1 Off-site Disposal

Total concentrations of copper in surface soil throughout the site exceed the predicted background concentrations, and off-site disposal or reuse as cleanfill would not be permitted. Deeper soils, subject to confirmation through additional testing, are likely to be suitable for disposal or reuse as cleanfill.

The reported concentrations of copper in most surface samples also exceed the total concentrations screening criteria for Class 1 Landfills (100 mg/kg) as well as site specific criteria for the Burnside (Dunedin) Landfill (400 mg/kg), and SJ Timpany Landfills (10 mg/kg). Zinc also exceeded the screening criteria for these landfills in some samples.

To determine if surplus soils would be acceptable for disposal at these locations, additional testing would be required using the TCLP method. Samples from this investigation are in storage at the laboratory and can be tested for leachability if required.

11.2 On-site Disposal

If on-site disposal in a dedicated encapsulation cell or bund is proposed, leachability using the Synthetic Precipitation Leaching Procedure (SPLP) adapted from the USEPA Method 1312. This method aims to simulate leaching from soils due to natural precipitation, e.g., in-situ or at a controlled/managed fill site. The SPLP method is similar to the TCLP test, except an unbuffered extractant fluid, similar to rainwater, is utilised. This testing is recommended to ensure that the concentrations of soil into a single, confined area does not pose a risk of generating leachate that could contaminate groundwater.

11.3 Reuse

Although soils throughout the site contain elevated concentrations of copper, they may be suitable for reuse in residential settings within the site.



A key consideration regarding the suitability of soil for this purpose is toxicity to plants (phytotoxicity).

According to the New Zealand Timber Treatment Guidelines, copper becomes phytotoxic at soil concentrations above 130 mg/kg; however, this value is strongly dependent on soil conditions and plant species which have variable tolerance to copper (MoH and MfE, 1997). Higher pH, organic matter, clay content, competing cations, and natural ageing processes all reduce copper bioavailability and therefore mitigate plant growth inhibition.

11.4 Soil Disposal Summary

In summary, surface soils are not suitable for off-site disposal or reuse as cleanfill due to the elevated concentrations of copper. Deeper soils, subject to confirmatory testing, are more likely to meet cleanfill criteria.

To determine acceptance at consented landfills, additional testing using the TCLP methodology is required. If on-site encapsulation or disposal is proposed, SPLP testing is recommended.

Surplus soils may be suitable for reuse within residential lots of the subdivision; however, the concentrations of copper present may inhibit plant growth, and further assessment may be necessary.



12 Summary and Conclusions

12.1 Summary

Rippon Holdings Limited and Rippon Investments Limited are seeking consent to undertake a residential development with associated industrial and commercial zones on a site located northwest of the Cromwell town centre. The site is currently an operational cherry orchard featuring planted trees, two man-made irrigation ponds and buildings associated with the orchard.

This combined Preliminary and Detailed Site Investigation (PSI-DSI) was undertaken to characterise the presence, nature, and extent of contaminants in soil across the Cherry Orchard Development site and to assess potential risks to human health, ecological receptors, and off-site environment.

The investigation included a comprehensive review of site history, previous land uses, regulatory records, and historic aerial imagery, in addition to a detailed site inspection and soil sampling and analysis.

The site has a well documented history spanning more than a century, transitioning from pastoral land to progressively developed orchard blocks between 2001 and 2021. The historical apricot orchard in the northwest corner represents the earliest horticultural activity, while the Judare, NZCP Netted, and NZCP Unnetted blocks reflect later cherry orchard development. Associated orchard hubs, frost fans, fuel storage, workshops, and minor fill areas were also identified as potential sources of contamination.

The site inspection confirmed the presence of expected horticultural infrastructure, including frost fans with self bunded fuel tanks, chemical storage sheds, spray mixing areas, and several zones with evidence of minor staining from diesel or lubricating oils. A small area of historical inert fill was also identified within the accommodation block; this material reportedly contains concrete, wire, waste cherries, stumps, and netting, with no indication of hazardous waste.

A total of 36 surface soil samples (0.0–0.1 m) were collected to characterise contaminants most likely to be present based on the Hazardous Activities and Industries List (HAIL) activities identified on site. Samples were analysed for heavy



metals, organochlorine pesticides (OCPs), and Total Petroleum Hydrocarbons (TPH), depending on location specific potential sources. Laboratory QA/QC procedures demonstrated high reproducibility and reliability of the analytical data.

Most heavy metals, including arsenic, cadmium, chromium, mercury, and nickel, were detected at concentrations within the range of predicted natural background and below residential Soil Contaminant Standards (SCSs). This indicates a low risk to human health from these contaminants.

Only one exceedance of the residential SCS was observed: a single lead result near a painted steel weatherboard shed within the NZCP Netted Hub. This elevated lead result is spatially limited to a small area (estimated 1.5 to 2 m halo around the shed). Under the proposed commercial/retail land uses in this area, the result does not indicate a significant human health risk.

Copper concentrations were substantially elevated across historic and operational orchard areas, with values ranging from background levels up to 1,570 mg/kg. While copper does not limit human health exposure under the NESCS, exceedances of both onsite terrestrial ecological guideline values and offsite sediment quality criteria were observed in numerous locations. These results reflect long term application of copper based sprays and highlight the potential for ecological effects, particularly relating to future vegetation establishment in residential gardens and landscaped areas.

Zinc concentrations were also elevated in some samples (maximum 535 mg/kg), exceeding offsite ecological screening criteria in several instances, but remaining below onsite ecological guideline values. These exceedances are similarly consistent with orchard operations where zinc containing fertilisers were historically applied.

TPH results showed no detectable light or midrange hydrocarbons. Elevated heavy range hydrocarbons (C15–C36) were present in multiple samples, with concentrations up to 1,200 mg/kg. Chromatographic patterns indicate that much of this material likely represents biogenic organic compounds (BOCs) rather than petroleum derived contamination. Only isolated areas of visible staining near workshop and fuel storage areas may reflect localised hydrocarbon spills; these areas are limited in extent and not considered representative of broader site conditions, but should be addressed through targeted clean-up prior to development. All TPH concentrations were below guidelines for human health and onsite ecological receptors, although some results exceeded offsite ecological sediment criteria.



OCPs were below laboratory reporting limits in all samples except one, where total DDT was detected at 0.106 mg/kg, well below the Otago Regional Council de minimis threshold of 0.35 mg/kg. These results suggest that persistent OCPs from historic orchard activity are not present in significant concentrations across the site.

The human health risk assessment concluded that contaminants identified on site are below the relevant NESCS criteria. Sitewide, risks to future residents are therefore considered low.

Ecological risks are primarily associated with elevated copper concentrations, which may inhibit plant growth and affect soil organisms in some areas. Robust sediment and erosion control measures will be essential during earthworks to minimise offsite movement of copper and zinc bearing soils.

Under the NESCS, the proposed land use change is considered a controlled activity, as contaminants do not exceed human health standards. Soil disturbance may be a permitted activity if volume-based thresholds and management controls are met; otherwise, it will also be a controlled activity.

From a regional planning perspective, the site is classified as contaminated due to ecological exceedances of copper, and earthworks for residential development will likely require consent under the Regional Plans for Waste and Water.

12.2 Conclusion

The PSI-DSI has demonstrated that:

- Historical and modern orchard activities have resulted in elevated copper and zinc concentrations across much of the site, consistent with long term spray use.
- It is highly unlikely that contaminants in soil would pose a risk to human health under the proposed land use, and widespread remediation for human health is not required.
- Ecological risks, particularly phytotoxicity from high copper concentrations, are more significant and will require consideration during landscape design, soil reuse, and earthworks planning.
- Off-site disposal of shallow topsoil is constrained by exceedances of background and landfill screening thresholds and will require additional leachability testing.



- Deeper soils are likely to be suitable for cleanfill disposal, subject to confirmatory sampling.

Overall, the site is suitable for the proposed mixed use development, provided that appropriate soil management, erosion control, and targeted additional investigations are undertaken to address the identified uncertainties.

12.3 Recommendations

Based on the findings of this PSI-DSI, the following recommendations are made to support future design, consenting, and development activities:

1. Further investigation or precautionary management of the accommodation block fill area. Although risks within this area are generally low, targeted intrusive investigation to confirm the absence of hazardous materials and inform appropriate management (e.g., removal or in-situ management) is recommended.
2. Additional vertical delineation of contaminants. Once the earthworks plan is finalised and areas of cut/fill are defined, additional soil samples should be collected at depth to determine vertical distribution of copper, zinc, and other contaminants where relevant. This will inform both soil management strategies and off-site disposal options.
3. Leachability assessment for surplus soil. If off-site disposal of surplus soil is required, TCLP testing where off-site disposal should be completed to confirm acceptance. SPLP testing should be completed where on-site encapsulation or managed fill is considered. These tests are recommended given exceedances of background and screening criteria for copper and zinc in surface soils.
4. Assessment of phytotoxicity and suitability for reuse. Evaluate the bioavailability and phytotoxicity of copper in soils intended for reuse within residential sections or landscaped areas. This may include pH testing, organic matter assessment, or targeted phytotoxicity testing to determine whether amelioration (e.g., blending, importation of clean topsoil, or soil amendment) is warranted.



5. Targeted Clean-up of visually impacted soils. As part of the orchard decommissioning, targeted clean-up of visually impacted soils (e.g. underneath the above ground diesel tanks) should be completed.



13 Report Certification

I, Simon Beardmore, of e3Scientific, certify that:

1. This Preliminary and Detailed Site Investigation meets the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (the NESCS) because it has been:
 - a. done by a suitably qualified and experienced practitioner, and
 - b. done in accordance with the current edition of Contaminated Land Management Guidelines No 5: Site Investigation and Analysis of Soils, and
 - c. reported on in accordance with the current edition of Contaminated Land Management Guideline No 1: Reporting on Contaminated Sites in New Zealand, and
 - d. the report is certified by a suitably qualified and experienced practitioner.

2. This Preliminary and Detailed Site Investigation concludes that:
 - a. it is more likely than not that activities or industries listed on the HAIL have occurred within the site.
 - b. Soil contamination at the site does not exceed the applicable standard in Regulation 7 of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations.
 - c.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner(s) who have done this investigation and certified this report is included in Appendix A.



20/04/2026

Signed and dated:



14 References

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Appendices

Appendix A:
e3Scientific Contaminated Land Experience

Contaminated Land Capabilities

Company background

e3Scientific Limited (e3Scientific) is a New Zealand owned and operated environmental science consultancy. Our team delivers innovative science, practical solutions, and expert advice to assist our clients in the smart management of the environment. Our staff are based in Queenstown Lakes, Central Otago, Invercargill, Hamilton and Christchurch.

Contaminated land services

e3Scientific provides a range of contaminated land services, including:

- Due Diligence Investigations.
- Preliminary Site Investigations.
- Detailed Site Investigations.
- Remedial options assessment and planning.
- Expert evidence, peer review and regulator support.

Our team

Our Contaminated Land team has a sound understanding of New Zealand's regulatory environment with respect to the assessment and management of contaminated land and has been a major supplier of contaminated land services in New Zealand since 2012.

Simon Beardmore (CENVP-SC) is the Technical Director of the Contaminated Land team at e3Scientific. Simon has over 18 years post graduate experience working as an Environmental Scientist, specialising in the investigation and management of contaminated land. Simon is responsible for technical oversight of projects and certifying contaminated land investigations as a suitably qualified and experienced practitioner (SQEP). Team Leader Fiona Rowley, Senior Environmental Scientists Jodi Halleux, Simon Bloomberg (CENVP), and Scott Fellers (CENVP) and Geospatial Analyst Jessie Lindsay deliver high quality reports that consistently meet client and council expectations.

The e3Scientific team is committed to professional development, and employing new technologies in the prevention, assessment and remediation of contaminated land. e3Scientific is an active member of the Australasian Land & Groundwater Association and WasteMINZ.

Projects

The e3Scientific team has completed numerous Preliminary Site Investigations, Detailed Site Investigations and remedial projects across New Zealand and regularly provides technical peer reviews of site investigations and consent applications for district and regional councils.

Projects have involved investigations of soil and groundwater quality associated with operational and historic timber treatment plants, fuel storage and distribution facilities, substations, sheep dips, orchards, market gardens, vineyards, agricultural activities, mining sites, gasworks, motor vehicle workshops, service stations, airports, wastewater treatment plants and operational and closed landfills, including a growing number of landfills which are vulnerable to the effects of climate change.

Since 2012, e3Scientific has completed a diverse range of contaminated land projects, including:

- Delivery of hundreds of Preliminary and Detailed Site Investigations to support subdivision, land use change and earthworks consent applications for a range of public and private sector clients.
- Support for Environment Southland's Selected Land Use Sites (SLUS) register by identifying hazardous activities on properties across Southland and auditing site investigations completed in the region.
- Assessment of groundwater contamination associated with the former Invercargill gasworks site, including the completion of a groundwater investigations and an environmental risk assessment to support a discharge consent application.
- Supervision and delivery of large-scale remedial works of former timber treatment plants and sheep dips, including the completion of Detailed Site Investigations to delineate the extent of contaminated soils, design of Remedial Action Plans, project management of remedial works and completion of site validation and council close out reports.
- Completion of broad-scale Preliminary Site Investigation reports to support installation of linear infrastructure and rezoning projects.
- Technical peer reviews of site investigations and consent applications for Environment Southland, Otago Regional Council, Waitaki District Council, Queenstown Lakes District Council, and Southland District Council.
- Provision of planning advice regarding contaminated land aspects of proposed developments.
- Investigation of arsenic impacted soils in Frankton, including the completion of detailed investigations to delineate the horizontal extent, consideration of the source of the arsenic, liaison with property owners and council.
- Project management of a bioavailability study of arsenic impacted soils in Gibbston Valley to support a Tier 2 risk assessment associated with a residential development.
- Supervision of the removal of multiple underground fuel storage systems for private residences, schools and oil industry clients.
- Delivery of several Contaminated Site Remediation Fund (CSRF) projects for investigation, remediation planning, and remediation of high-priority sites in New Zealand.
- Policy analysis of contaminated land regulation and potential legislative changes.
- Provision of expert evidence in contaminated land matters for consent hearings.

Simon Beardmore (CENVP-SC)

Technical Director – Contaminated Land

e3Scientific

Arrow Lane, Arrowtown

e. s 9(2)(a)

m. s 9(2)(a)

w. e3Scientific.co.nz

Current Position

Technical Director – Contaminated Land, e3Scientific (2021 -)

Formal Qualifications

MSc (Environmental Sustainability) with Distinction, University of Edinburgh, Scotland, 2006.

BSc (Environmental Science), First Class Honours, Simon Fraser University, Canada, 2005.

Technical Capabilities

Contaminated land investigation and reporting (Sampling and Analysis Plans, Preliminary and Detailed Site Investigations, Remediation Action Plans, Site Validation Reports and Site Management Plans), risk assessment, contaminated land policy and planning.

Software Capabilities

ArcGIS, QGIS, ProUCL, Office 365

Career Summary

Simon joined e3Scientific in June 2019, having developed a strong regulatory background from nearly ten years at the Otago Regional Council. At the ORC, his primary responsibilities included developing contaminated land management strategy, undertaking site investigations, developing and maintaining a spatial register of contaminated land / hazardous activity and industry data, peer reviewing preliminary and detailed site investigations, providing technical advice to support policy and consenting teams, and managing remediation projects awarded central government funding. Since joining e3s, Simon has continued to provide valuable support to local authorities in Otago and Southland, as well as prepare comprehensive site investigations and risk assessment work for a range of private sector and government clients. As a Technical Director, Simon continues to have a hands-on approach to field investigation and report writing while supporting the team by overseeing investigation design, mentoring staff, and reviewing and certifying reports.

Affiliations

- Australasian Land and Groundwater Association (ALGA)
- Waste Management Institute of New Zealand (WasteMINZ)

Key Projects

- Little Tahiti (Milford Sound) Landfill Investigation and Remedial Planning
- Ōamaru Gasworks Investigation and Remedial Planning
- Discussion paper on Resource Management Reform and Contaminated Sites
- Contaminated land and regulatory support for territorial and regional authorities.

Fiona Rowley

Team Leader – Contaminated Land

e3Scientific

Arrow Lane, Arrowtown

e. s 9(2)(a)

m. s 9(2)(a)

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Current Position

Team Leader – Contaminated Land, e3Scientific (2021 -)

Formal Qualifications

BSc (Geology) University of Canterbury, New Zealand, 2009

Technical Capabilities

Contaminated land investigation and reporting (Sampling and Analysis Plans, Preliminary and Detailed Site Investigations, Remediation Action Plans, Site Validation Reports and Site Management Plans), risk assessment, contaminated land policy and planning.

Software Capabilities

ArcGIS, QGIS, ProUCL, Office 365

Career Summary

Fiona is a professional environmental scientist with over 10 years' experience working in the earth science industry throughout the South Island, predominantly in the Otago and Southland Regions. Prior to commencing work with e3Scientific, Fiona was employed as a Field and Mine Geologist at Stockton Alliance Mine, Westport. Fiona is principally experienced in project managing contaminated soil investigations including preliminary and detailed site investigations, development of sample and analysis programmes, soil disposal routes and site management plans for a variety of HAIL sites.

Fiona has completed both large and small scale projects including extensive remedial work of former timber treatment plants, landfill investigations, fuel distribution facilities, oxidation ponds, and sheep-dips. Fiona has assisted in bio-availability studies examining elevated background arsenic concentrations. Fiona has extensive experience in using e3Scientific's portable handheld X-Ray Fluorescence tool.

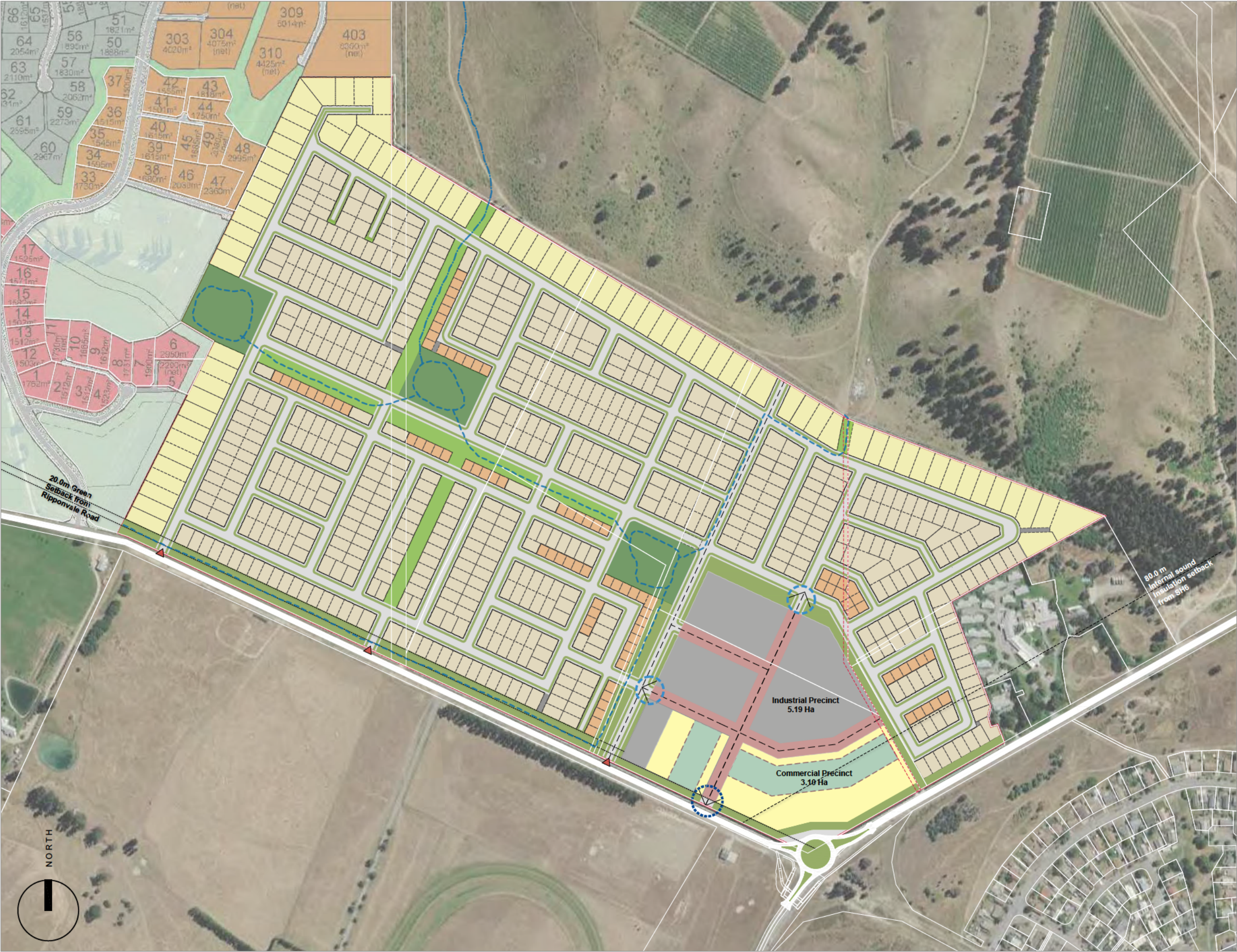
Affiliations

- Australasian Land and Groundwater Association (ALGA)

Key Projects

- Tewa Banks (Arrowtown) Oxidation Pond Investigation and Remedial Planning
- North Lake (Wanaka) Timber Treatment Plant Investigation and Remedial Planning
- Mt Rosa (Gibbston Valley) Geogenic Arsenic Bioavailability Investigation
- Invercargill Central (Invercargill) Historic Contamination Investigation and Determining Disposal Routes.

Appendix B:
Development Plans



INDICATIVE MASTERPLAN

LEGEND

SITE BOUNDARY

RETAIL PRECINCT

LIGHT INDUSTRIAL PRECINCT

BUSINESS ZONE INDICATIVE ROADS

GREEN BUFFER

OPEN GREEN SPACE /GREEN CONNECTIONS

NEIGHBOURHOOD PARK

LARGE LOTS-1000 sqm (80 LOTS)

LOW DENSITY- 400 sqm (581 LOTS)

MEDIUM DENSITY- 200 sqm (94 LOTS)

INDICATIVE RETAIL BUILT FORM

EXISTING ACCESS TO PROPERTY AT Part Section 48 Block III Cromwell SD

FLOOD CHANNELS/ STORM WATER MANAGEMENT AREAS

RURAL URBAN GATEWAY

CONNECTION WITH NEIGHBOURHOOD SUB DIVISION DEVELOPMENTS

ENTRY/EXIT TO RESIDENTIAL PRECINCT

Note: All cadastral property line are shown in white colour (source- LINZ)

RMM

ROUGH MILNE MITCHELL
LANDSCAPE ARCHITECTS

CHRISTCHURCH
WĀNAKA
AUCKLAND
DUNEDIN
NELSON
rmmla.co.nz

+64 3 366 3268
+64 3 974 7940
+64 21 244 8630
+64 27 498 8795
+64 27 250 0500
info@rmmla.co.nz

INDICATIVE MASTERPLAN
SHANNON FARM RESIDENTIAL AND
COMMERCIAL EXTENSION,
KAWARAU GORGE ROAD,
CROMWELL.

JOB No.

24197

SCALE

1:5000@ A3

DATE

06/05/2026

DESIGNED

RMM

DRAWN

VSB

CHECKED

TM

STATUS

DRAFT

DRAWING No.

REVISION

M 1.0

0

SERIES

1 of 1

Appendix C:
Historic Certificates of Title



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 **126180**

Land Registration District **Otago**

Date Issued 05 August 2004

Prior References

OT109/201 OT7C/631

Estate Fee Simple
Area 93.0792 hectares more or less
Legal Description Lot 2 Deposited Plan 330709 and Section
4, 11, 98, 101, 103 Block III Cromwell
Survey District and Part Section 5, 25
Block III Cromwell Survey District and
Part Run 1201R

Original Registered Owners

Leyser Brothers Limited

Interests

Excepting and reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land

Subject to Section 8 Mining Act 1971 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

Subject to Section 168A Coal Mines Act 1925 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

Lot 2 on DP 330709 is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

Subject to Section 241(2) Resource Management Act 1991 (affects DP 330709)

Subject to a right to convey water over part Section 11 marked A DP 344529, over part Section 98 marked B DP 344529 and over part lot 2 DP 330709 marked C DP 344529 created by easement Instrument 6264801.4 - 23.12.2004 at 9:00 am

The easements created by Easement Instrument 6264801.4 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right to convey water over part marked A, B and C on DP 344529 created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am

10402937.1 CAVEAT BY AURORA ENERGY LIMITED - 19.4.2016 at 11:11 am

11175490.1 Withdrawal of Caveat 10402937.1 - 6.8.2018 at 7:29 am

Subject to a right (in gross) to convey electricity over part Part Section 5 marked A, Section 103 marked B, Section 11 marked C and D and Section 98 Block III Cromwell Survey District marked E and the right to transform electricity over part Section 11 Block III Cromwell Survey District marked D on DP 524841 in favour of Aurora Energy Limited created by Easement Instrument 11175490.2 - 6.8.2018 at 7:29 am

11211780.1 Discharge of Mortgage 5067301.3 - 31.8.2018 at 4:12 pm

11211780.2 Transfer to New Zealand Cherry Corp (Leyser) GP Limited - 31.8.2018 at 4:12 pm

11211780.3 Mortgage to Bank of New Zealand - 31.8.2018 at 4:12 pm

11236074.1 Transfer to New Zealand Cherry Corp (Leyser) Limited Partnership - 19.11.2018 at 11:19 am

13078798.1 Correction of Name of New Zealand Cherry Corp (Leyser) Limited Partnership to New Zealand Cherry Corp (Leyser) LP - 22.8.2024 at 4:51 pm

13078798.2 Variation of Mortgage 11211780.3 - 22.8.2024 at 4:51 pm

13113009.1 CAVEAT BY AURORA ENERGY LIMITED - 17.9.2024 at 11:40 am

13360249.1 CAVEAT BY AURORA ENERGY LIMITED - 21.7.2025 at 3:41 pm

Subject to a right (in gross) to convey electricity over part Section 11 Block III Cromwell Survey District marked A on DP 571108 in favour of Aurora Energy Limited created by Easement Instrument 13245069.1 - 1.8.2025 at 9:29 am

Reference:

Certificate No. 503235/1

P.R. Vol. Folio

Transfer No.

G.N. 435241

Proc. 3315

SOLE COPY

CANCELLED

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 12th day of September one thousand nine hundred and seventyeight under the seal of the District Land Registrar of the Land Registration District of OTAGO being a Certificate in lieu of Grant, **WITNESSETH** that THEODORUS HENDRIKUS LEYSER of Cromwell Farmer, MARIE THERESIA LEYSER his wife and the TRUSTEES EXECUTORS AND AGENCY COMPANY OF NEW ZEALAND LIMITED are as tenants in common in equal shares

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, which said land was originally acquired by the abovenamed

as from the 10th day of December one thousand nine hundred and seventy-six under Section 54 of the Land Act 1948 that is to say: All that parcel of land containing 8.0407 hectares more or less being Sections 96, 98, 99, 100, 101, 102 and 103 Block III CROMWELL SURVEY DISTRICT.

Subject to the reservations and conditions imposed by Section 8 of the Mining Act 1971 and Section 168a of the Coal Mines Act 1925

ASSISTANT LAND REGISTRAR



A.L.R.

503235/2) Cancelled as to Sections 98, 101 and
12.9.1978) 103 Block III and new C.T. 7C/631
issued

A.L.R.

503235/3) Cancelled as to Sections 96, 99
12.9.1978) and 102 Block III and new C.T.
7C/632 issued

A.L.R.

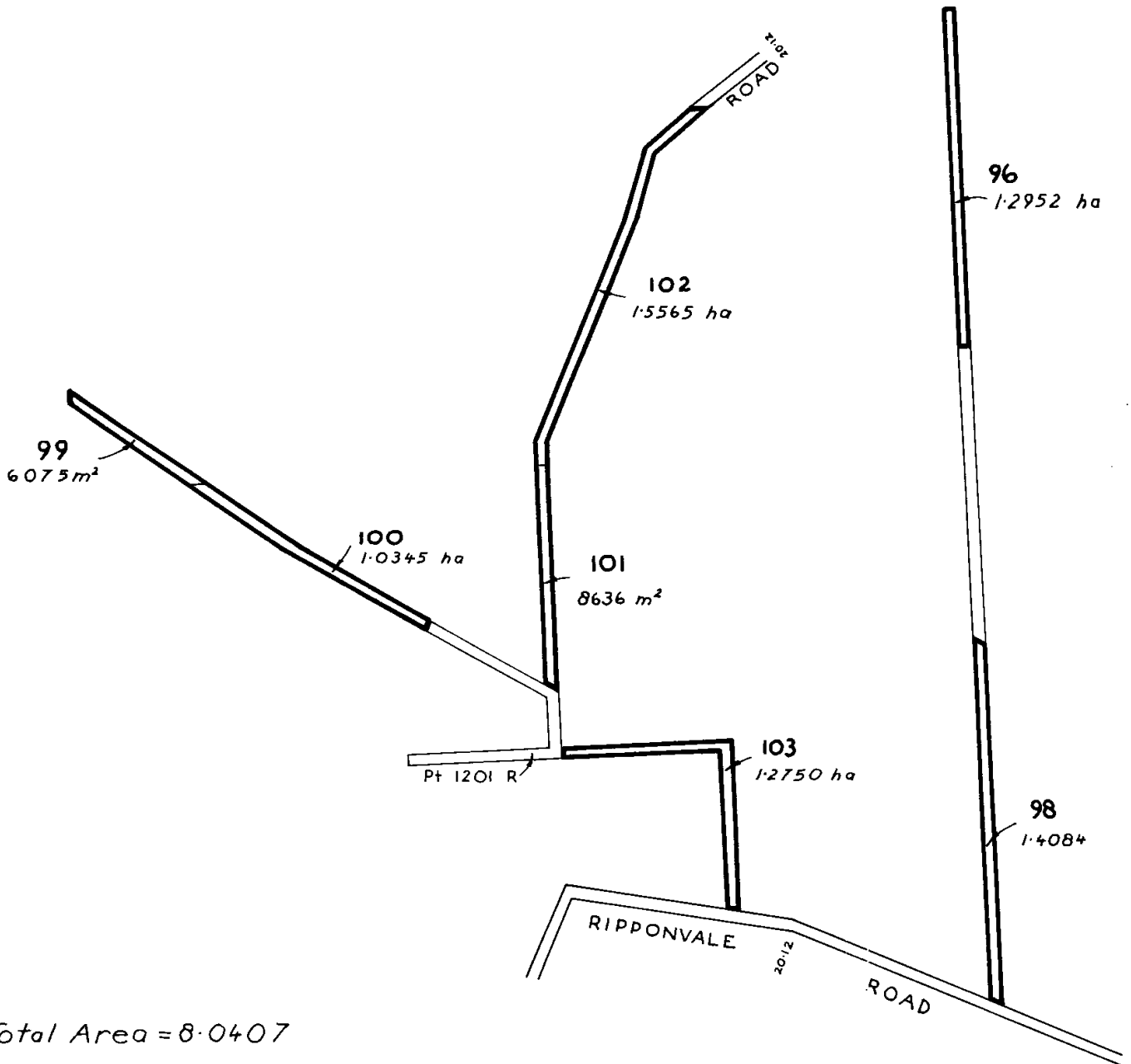
503235/4) Cancelled as to balance (being
12.9.1978) Section 100 Block III) and new
C.T. 7C/633 issued

A.L.R.



Scale 1 inch =

7C/630



Total Area = 8.0407

Scale = 1:10000

8.

7C/630



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy




R.W. Muir
Registrar-General
of Land

Identifier **OT7C/631** **Cancelled**

Land Registration District **Otago**

Date Issued 12 September 1978

Prior References

OT7C/630 OTA1/708

Estate	Fee Simple
Area	62.4440 hectares more or less
Legal Description	Section 4, Section 11, Section 98, Section 101, Section 103 and Part Section 5, 25, 1201R Block III Cromwell Survey District

Original Proprietors

Johannes Theodorus Wilhelmus Leyser as to a 1/2 share

Trevor Joseph Leyser as to a 1/2 share

Interests

Excepting and reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land and rights of ingress, egress and regress to all persons lawfully engaged in working any such minerals, mineral oil, gas, metals, coal or stone

Subject to Section 8 Mining Act 1971 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

Subject to Section 168A Coal Mines Act 1925 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

412496 Mortgage over Sections 4 and 11 and part Sections 5, 25 and 1201R to Bank of New Zealand - 19.10.1973 at 2:41 pm

5063218.1 Departmental Dealing correcting the memorials by adding the memorial for Mortgage 412496 - 24.7.2001 at 3:50 pm

5067301.1 Discharge of Mortgage 412496 - 3.8.2001 at 10:41 am

5067301.2 Transfer to Leyser Brothers Limited - 3.8.2001 at 10:41 am

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

The right of entry reserved under the Land Act 1924 was cancelled by virtue of Section 48 of the Crown Minerals Act 1991

6104514.1 CT 126180 issued - 5.8.2004 at 9:00 am.

CANCELLED

References

Prior C/T 7C/630, A1/708

Transfer No.

N/C. Order No. 503235/2

Land and Deeds 69



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 12th day of September one thousand nine hundred and seventyeight under the seal of the District Land Registrar of the Land Registration District of O T A G O

WITNESSETH that THEODORUS HENDRIKUS LEYSER of Cromwell, Farmer, MARIE THEFESIA LEYSER his wife and THE TRUSTEES EXECUTORS AND AGENCY COMPANY OF NEW ZEALAND LIMITED a duly incorporated company having its registered office at Dunedin are as tenants in common in equal shares

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 84.4052 hectares more or less being Sections 4, 11, 98, 101 and 103 and part Sections 5, 25, and 1201R Block III CROMWELL DISTRICT the said part Section 25 being part of the land in Deposited Plan 2714. Excepting and reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land and rights of ingress, egress and regress to all persons lawfully engaged in working any such minerals, mineral oil, gas, metals, coal or stone.

Interests at date of issue:

Sections 98, 101 and 103 are subject to the reservations and conditions imposed by Section 8 of the Mining Act 1971 and Section 168a of the Coal Mines Act 1925



412496 Mortgage over Sections 4 and 11 and part Sections 5, 25 and 1201R to Bank of New Zealand - 19.10.1973 at 2.41 pm

A.L.R.

DISCHARGED
X19409 Irrigation Agreement against Sections 4, 11 and part Section 5 under part XI Public Works Act 1928 with Her Majesty the Queen - 2.12.1957 at 2.38 pm

655273/1 Mortgage to The Rural Banking and Finance Corporation of New Zealand - 30.4.1986 at 10.00am

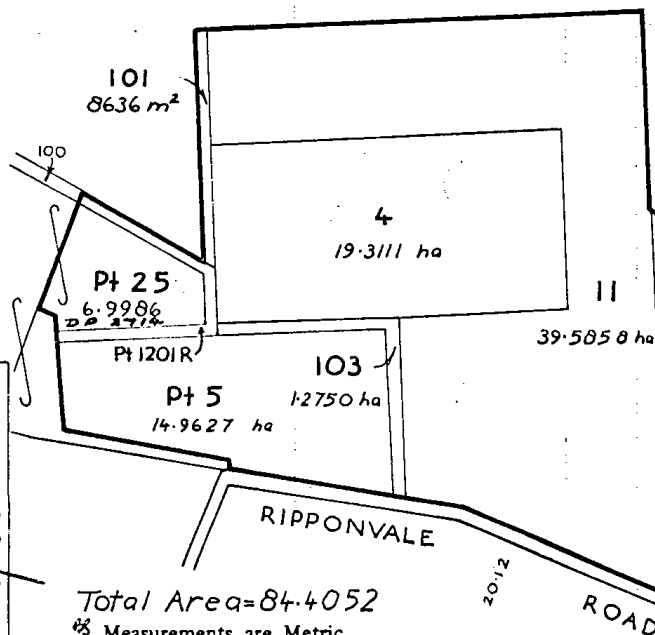
A.L.R.

655273/2 Memorandum of Priority ranking Mortgage 655273/1 as a first mortgage and Mortgage 412496 as a second mortgage - 30.4.1986 at 10.00am

A.L.R.

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

Amended 7.6.1985



Total Area=84.4052

Measurements are Metric

SCALE 1:10000

7C/631

No.

863945/1 Transfer of their 1/3 share The Trustees Executors and Agency Company of New Zealand Limited to Johannes Theodorus Wilhelmus Leyser and Trevor Joseph Leyser both of Cromwell farmers as tenants in common in equal shares - 31.8.1994 at 9.45am



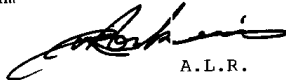
A.L.R.

863945/2 Transmission of his 1/3rd share Theodorus Hendrikus Leyser to The Trustees Executors and Agency Company of New Zealand Limited entered 31.8.1994 at 9.45am



A.L.R.

863945/3 Transfer of their 1/3 share acquired by Transmission 863945/2 The Trustees Executors and Agency Company of New Zealand Limited to Johannes Theodorus Wilhelmus Leyser of Cromwell farmer and Trevor Joseph Leyser of Cromwell farmer as tenants in common in equal shares - 31.8.1994 at 9.45am



A.L.R.

946990.1 Transfer of the 1/3 share of Marie Theresia Leyser to Johannes Theodorus Wilhelmus Leyser and Trevor Joseph Leyser in equal shares 29.4.1998 at 9.07


for D.L.R.



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy




R.W. Muir
Registrar-General
of Land

Identifier **OT109/201** **Cancelled**

Land Registration District **Otago**

Date Issued 04 February 1896

Prior References

OTPR11/85 WA 3/20

Estate Fee Simple
Area 40.2940 hectares more or less
Legal Description Section 31 Block III Cromwell Survey
District

Original Proprietors

Johannes Theodorus Wilhelmus Leyser as to a 1/2 share
Trevor Joseph Leyser as to a 1/2 share

Interests

The abovementioned land is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.

Subject to a right of way over part within land appurtenant to Section 48 Block III Cromwell Survey District (CT OT197/39) created by Transfer 302608 - 14.7.1966 at 2.41 pm

412496 Mortgage to Bank of New Zealand - 19.10.1973 at 2.41 pm

544716 Gazette Notice declaring a portion of State Highway No 6 fronting the within land to be a limited access road - 11.11.1980 at 2.46 pm

5067301.1 Discharge of Mortgage 412496 - 3.8.2001 at 10:41 am

5067301.2 Transfer to Leyser Brothers Limited - 3.8.2001 at 10:41 am

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

6104514.1 CTs issued - 5.8.2004 at 9:00 am

Legal Description	Title
Lot 1 Deposited Plan 330709	126179
Lot 2 Deposited Plan 330709	126180

CANCELLED

[SCHEDULE 1.

NEW ZEALAND.



Register-book,

Vol. 109, folio 201

Reference: Warrant No. 26
P.R. folio 85 66 11

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

This Certificate, dated the fourth day of February, one thousand eight hundred and ^{nearly}~~eighty~~ six, under the hand and seal of the District Land Registrar of the Land Registration District of Otago, being a Certificate in lieu of Grant, under Warrant of His Excellency the Governor, in exercise of the powers enabling him in that behalf, ~~do~~ ^{testify} that

James Ritchie of Cromwell Mass.

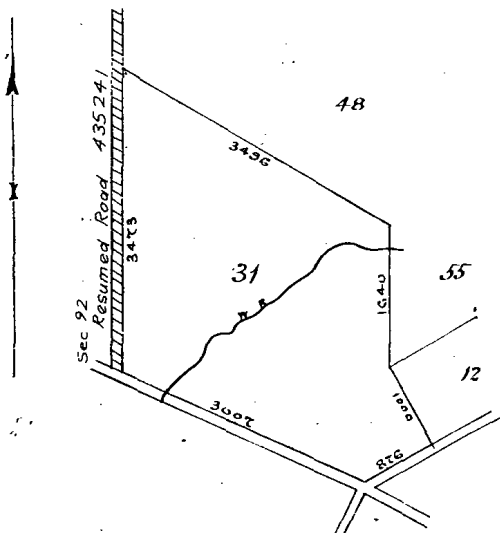
is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or indorsed hereon; subject also to any existing right of the Crown to take and lay off roads under any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan drawn hereon, bordered well, be the several admeasurements a little more or less, which said land is in the said Warrant expressed to have been originally acquired by the said James O'Brien as from the thirty first day of August, one thousand eight hundred and eighty five the said 1885, that is to say: All that

parcel of land containing nearly one (99) acres two (2) roods and eleven (11) poles more or less situated in the Greenwell District being section thirty (31) Block three (31) Mineral on the Indian Map of the and District pointed in the Office of the Chief Surveyor at Powder Imp marked by a water race pointed also on said Block to be seen

EQUIVALENT METRIC
40.2940 ha
AREA: 81.161

Block III Cromwell District

99. 2. 11



Scale 10 chains to an inch
Surveyed by A. B. Mackay June 1878
Chief Surveyor C. W. Adams
Chief Draughtsman P. Treseder

The above mentioned land is subject to interests
agreements and rights under the law relating
to mining, minerals and minerals.

Mortgage W. Bury James Ritchie to Karl
Patsch - Entered 15th October 1896 at 11.40 P.M.

Discharge of Mortgage No 18474 Entered
8th September 1911 at 10.20 at *Wood 2000*

Mortgage N° 39038 James Ritchie to James
Gooker and William Jelley Entered etc
Sept. 1894 at 12 30 PM

Mortgage W-46351 James Ritchie to Wels
Peter Kloogah Entered 5th July 1915 at 74.55 ac

Discharge of Mortgage of No 39038. Entered 18th Decem
1917 at 30.00. *Dahyup*

Discharge of Mortgage No. 46351. Entered 18th Decr
1917 at 2.30 p.m. J. Dalrymple

Mortgage No. A9509 - James Ritchie to William B.
Entered 18th December 1874 at 2 35c
Do. 5 3- ✓ Balance to acc.

Transfer N^o 77906 of Bertgox N^o 19569 William L
to Henry Kelp. paid 4th May 1921
and

C.T.109/201

109/201
Transmission of 11575 to Malcolm Ritchie of
Cromwell Butcher and Robert Ritchie of Cromwell
Farmer entered 5th December 1922 at 2:38 pm
A.L.R.

Transfer No 104689 Malcolm Ritchie and
Robert Ritchie to Robert Ritchie and Duncan
Ritchie both of Cromwell Farmers as tenants
in common in equal shares produced 14th
March 1950 at 2:10 pm
A.L.R.

Transfer 146959 Robert Ritchie and Duncan
Ritchie to Thomas Alfred Crabbe of Panmure
Farmer produced 24th October 1944 at 12:00
pm
A.L.R.

DISCHARGED Mortgage 120041 Thomas Alfred Crabbe to
Robert Ritchie and Duncan Ritchie produced
24th October 1944 at 12:00 pm
A.L.R.

Transmission 31542 of Mortgage 120041
to Robert Ritchie and Duncan Ritchie entered
20th March 1950 at 12:10 pm
A.L.R.

Transmission 35369 of Mortgage 120041
to T. B. Phillips entered 9th December 1954
at 2:20 pm
A.L.R.

189602 Irrigation Agreement under Part XI
Public Works Act 1928 between Her Majesty
the Queen and Thomas Alfred Crabbe (as
named) produced 2nd December 1957
at 2:30 pm
A.L.R.

229329 Transfer Thomas Alfred Crabbe to Thomas Murray Crabbe and
Greene both Crabbe both of Cromwell Farmers as tenants in
common in equal shares produced 30.1.1946 at 2:26 pm
A.L.R.

DISCHARGED Mortgage 229329 Crabbe and Greene both Crabbe
to Thomas Alfred Crabbe produced 30.1.1946 at 2:26 pm
A.L.R.

302608 Transfer of a Right of Way over
part within land adjacent to Section 48
Block 3 Cromwell Survey District
(S 197/39) to Paul Charles Sanders of
Cromwell Butcher - 14/7/1986 at 2:46 pm
A.L.R.

Variation of Mortgage 229370 - 13.2.1970 at 2:48 pm
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.
A.L.R.

109/201

412494 Transfer to Theodorus
Hendrikus Leyser of Cromwell
Farmer, Marie Theresia Leyser his
wife and The Trustees Executors
and Agency Company of New Zealand
Limited as tenants in common in
equal shares - 19.10.1973 at
2:38 pm
A.L.R.

412495 Mortgage to The Trustees
Executors and Agency Company of
New Zealand Limited - 19.10.1973
at 2:40 pm
A.L.R.

412496 Mortgage to Bank of New
Zealand - 19.10.1973 at 2:41 pm
A.L.R.

The unformed road adjoining the
within land is now known as
Section 92 Block III Cromwell
Survey District - See
Re-Appellation 435238
A.L.R.

CERTIFICATE OF TITLE,

Vol. , folio

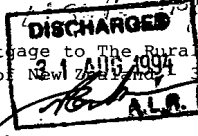
435241 Gazette Notice declaring
Section 92 Block III Cromwell
Survey District to be transferred
to the Crown pursuant to Section
191B of the Counties Act 1956
and to be deemed to be Crown
Land subject to the Land Act
1948 - 9.1.1975 at 9:30 am
A.L.R.

478731 Mortgage to The Rural
Banking and Finance Corporation
of New Zealand - 31.5.1977 at
9.12 am
A.L.R.

503594 Certificate under Sub-Section (1)
of Section 280 of the Public Works Act
1928 - 18.9.1978 at 12:07 pm
A.L.R.

OVER

544716 Gazette Notice declaring a portion
of State Highway No 6 fronting the within
land to be a limited access road - 11.11.1980
at 2.46pm (page 5)



655273/1 Mortgage to The Rural Banking and Finance
Corporation of New Zealand - 30.4.1986 at 10.00am

A.L.R.

655273/2 Memorandum of Priority ranking Mortgage
655273/1 as a first mortgage and Mortgage 412496
as a second mortgage - 30.4.1986 at 10.00am

A.L.R.

863945/1 Transfer of their 1/3 share The
Trustees Executors and Agency Company of
New Zealand Limited to Johannes Theodorus
Wilhelmus Leyser and Trevor Joseph Leyser
both of Cromwell farmers as tenants in
common in equal shares - 31.8.1994 at
9.45am

A.L.R.

863945/2 Transmission of his 1/3rd share
Theodorus Hendrikus Leyser to The
Trustees Executors and Agency Company of
New Zealand Limited entered 31.8.1994 at
9.45am

A.L.R.

863945/3 Transfer of their 1/3 share
acquired by Transmission 863945/2 The Trustees
Executors and Agency Company of New
Zealand Limited to Johannes Theodorus
Wilhelmus Leyser of Cromwell farmer and
Trevor Joseph Leyser of Cromwell farmer
as tenants in common in equal shares -
31.8.1994 at 9.45am

A.L.R.

946990.1 Transfer of the 1/3 share of
Marie Theresia Leyser to Johannes
Theodorus Wilhelmus Leyser and Trevor
Joseph Leyser in equal shares
29.4.1998 at 9.07

K. Hyle
for DLR

432/8

Vol. 432 Folio 8

Land and Deeds—4
FORM No. 2

REGISTER

Reference: Vol. 194 Folio 137, 202/178
202/89
Transfer No. 229329
Order for N/C No.

DUPLICATE DESTROYED
5176

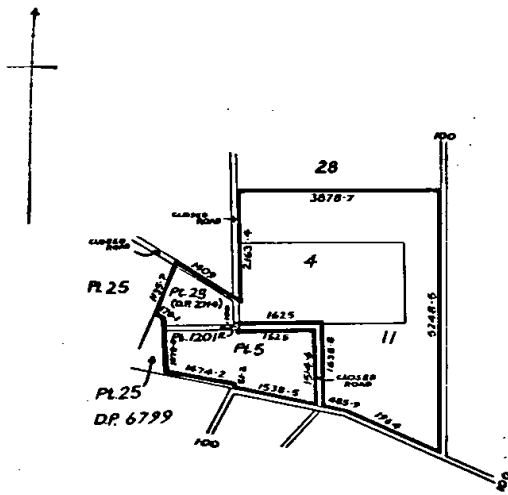
NEW ZEALAND

Register-book
Vol. 432, folio 8

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the Thirtieth day of January, one thousand nine hundred and sixtyone
under the hand and seal of the District Land Registrar of the Land Registration District of O T A G O WITNESSETH that
THOMAS MURRAY CRABBE and GRAEME SCOTT CRABBE both of Cromwell Farmers are as tenants in common in equal
shares —

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 199 acres 3 roods 8.8 perches more or less being Sections 4 and 11 and part Sections 5, 25 and 1201B Block III CROMWELL DISTRICT the said part Section 25 being also part of the land delineated on Deposited Plan 2714 Excepting and Reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land and rights of ingress, egress and regress to all persons lawfully engaged in working any such minerals, mineral oil, gas, metals, coal or stone.



EQUIVALENT METRIC

AREA IS 80.8582 ha

Total Area.

199 a. 3 r. 08.8 r.

Scale:— 20 Chains to an Inch.



A. L. R.
District Land Registrar.
Assistant

229329 Thomas Murray Crabbe and Graeme Scott
Crabbe to Thomas Alfred Crabbe produced 30.1.1961 at
2.28.00c.

CANCELLED: SEE NOW
C.T. A/1708
A. L. R. 11/1/62



Reference:
Prior C/T. 432/8
Substitution
Transfer No. 229329
N/C. Order No.



Land and Deeds 69

REGISTER
CANCELLED

No. A1/708

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 1st day of November one thousand nine hundred and sixtytwo under the seal of the District Land Registrar of the Land Registration District of OTAGO

WITNESSETH that THOMAS MURRAY CRABBE and GRAEME SCOTT CRABBE both of Cromwell Farmers are as tenants in common in equal shares

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 199 acres 3 roods 8.8 perches more or less being Sections 4 and 11 and part Sections 5, 25 and 1201R Block III CROMWELL DISTRICT the said part Section 25 being also part of the land delineated on Deposited Plan 2714 Excepting and Reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land and rights of ingress, egress and regress to all persons lawfully engaged in working any such minerals, mineral oil, gas, metals, coal or stone.

DISCHARGED

229330 Mortgage 1972 Thomas Alfred Crabbe
- 30.1.1962 at 2.48 pm.

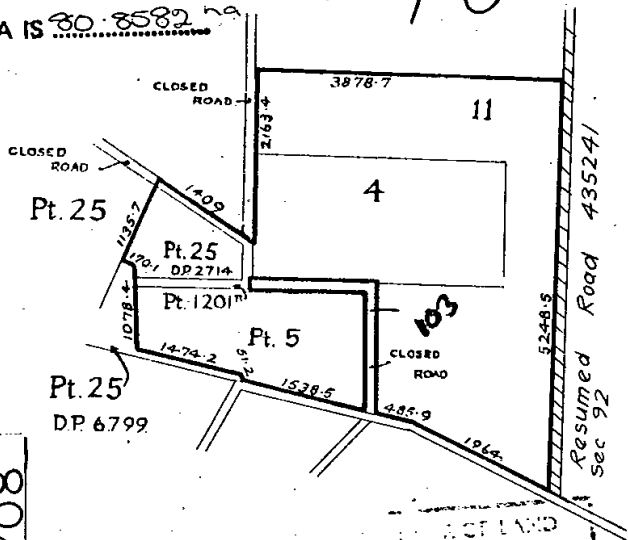
Variation of Mortgage 229330 -
13.2.1970 at 2.48 pm

A.L.R.

412494 Transfer to Theodorus Hendrikus Leyser of Cromwell Farmer, Marie Theresia Leyser his wife and The Trustees Executors and Agency Company of New Zealand Limited as tenants in common in equal shares - 19.10.1973 at 2.38 pm

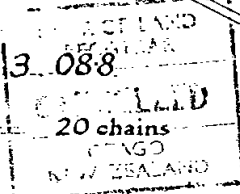
A.L.R.

EQUIVALENT METRIC
AREA IS 80.8582 ha



Total Area: 199.3.088

Scale: 1 inch = 100 ft.



DISTRICT LAND REGISTRAR

412495 Mortgage 1973 The Trustees Executors and Agency Company of New Zealand Limited - 19.10.1973 at 2.40 pm

412496 Mortgage to Bank of New Zealand - 19.10.1973 at 2.41 pm

The unformed road adjoining the within land is now known as Section 92 Block III Cromwell Survey District - See Re-Appellation 435238

435241 Gazette Notice declaring Section 92 Block III Cromwell Survey District to be transferred to the Crown pursuant to Section 191B of the Counties Act 1956 and to be deemed to be Crown Land subject to the Land Act 1948 - 9.1.1975 at 9.30 am

503235/2) Cancelled and C.T. 70/631 issued
12.9.1978)

Duplicate
Destroyed 2/10/1978

Register copy for L. & D. 12/9/1978 W



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy




R.W. Muir
Registrar-General
of Land

Identifier 126179

Cancelled

Land Registration District Otago

Date Issued 05 August 2004

Prior References

OT109/201

Estate	Fee Simple
Area	32.0170 hectares more or less
Legal Description	Lot 1 Deposited Plan 330709
Original Proprietors	Leyser Brothers Limited

Interests

The abovementioned land is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.

Subject to a right of way over part marked A on DP 330709 created by Transfer 302608 - 14.7.1966 at 2:41 pm

544716 Gazette Notice declaring a portion of State Highway No 6 fronting the within land to be a limited access road - 11.11.1980 at 2:46 pm

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

6264801.1 Notice pursuant to Section 93 Transit New Zealand Act 1989 (affects DP 344529) - 23.12.2004 at 9:00 am

6264801.2 CTs issued - 23.12.2004 at 9:00 am

Legal Description	Title
Lot 1 Deposited Plan 344529	182714
Lot 2 Deposited Plan 344529	182715
Lot 3 Deposited Plan 344529	182716
Lot 4 Deposited Plan 344529	182717

CANCELLED



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 **182714**
Land Registration District **Otago**
Date Issued 23 December 2004

Prior References
126179

Estate Fee Simple
Area 8.0036 hectares more or less
Legal Description Lot 1 Deposited Plan 344529
Original Registered Owners
Leyser Brothers Limited

Interests

The abovementioned land is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

Subject to a right of way over part marked I DP 344529 created by Transfer 302608 - 14.7.1966 at 2.41 pm

544716 Gazette Notice declaring a portion of State Highway No 6 fronting the within land to be a limited access road - 11.11.1980 at 2.46 pm

6264801.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 23.12.2004 at 9:00 am

Appurtenant hereto are rights to convey water created by Easement Instrument 6264801.4 - 23.12.2004 at 9:00 am

The easements created by Easement Instrument 6264801.4 are subject to Section 243 (a) Resource Management Act 1991

6286641.1 Discharge of Mortgage 5067301.3 - 24.1.2005 at 9:00 am

6286641.2 Transfer to Rippon Holdings Limited (1/2 share) and Rippon Investments Limited (1/2 share) - 24.1.2005 at 9:00 am

6286641.3 Mortgage to Southland Building Society - 24.1.2005 at 9:00 am

6464767.1 CAVEAT BY AURORA ENERGY LIMITED - 20.6.2005 at 9:00 am

7073932.1 Withdrawal of Caveat 6464767.1 - 17.10.2006 at 9:00 am

Appurtenant hereto is a right to convey electricity created by Easement Instrument 7073932.3 - 17.10.2006 at 9:00 am

Subject to a right to convey water over part marked M, H and O, a right to store and take water marked M, a right to convey electricity and telecommunication cables marked G and O and a right to pump water marked O on DP 367909 created by Easement Instrument 7073932.5 - 17.10.2006 at 9:00 am

Subject to a right (in gross) to convey electricity over part marked G on DP 367909 in favour of Aurora Energy Limited created by Easement Instrument 7073932.6 - 17.10.2006 at 9:00 am

7324408.1 Variation of Mortgage 6286641.3 - 17.4.2007 at 9:00 am

Subject to a right of way over part marked A on DP 420009 created by Easement Instrument 8287639.7 - 9.10.2009 at 3:58 pm

The easements created by Easement Instrument 8287639.7 are subject to Section 243 (a) Resource Management Act 1991 9507954.1 CAVEAT BY AURORA ENERGY LIMITED - 6.9.2013 at 10:16 am

9850689.1 Withdrawal of Caveat 9507954.1 - 30.9.2014 at 10:02 am

9850689.3 Discharge of Mortgage 6286641.3 - 30.9.2014 at 10:02 am

9850689.4 Variation of the conditions of the easement created by Easement Instrument 8287639.7 - 30.9.2014 at 10:02 am

Subject to a right (in gross) to convey electricity and a right to transform electricity over part marked B all on DP 471620 in favour of Aurora Energy Limited created by Easement Instrument 9850689.5 - 30.9.2014 at 10:02 am

9850689.7 Mortgage to Bank of New Zealand - 30.9.2014 at 10:02 am

Subject to a right to convey water over part marked D on DP 494242 created by Easement Instrument 10348821.1 - 22.6.2016 at 12:32 pm

Appurtenant hereto is a right to convey water created by Easement Instrument 10348821.1 - 22.6.2016 at 12:32 pm

Subject to a right (in gross) to convey and transform electricity over part marked B on DP 571108 in favour of Aurora Energy Limited created by Easement Instrument 13245069.1 - 1.8.2025 at 9:29 am



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 **476973**
Land Registration District **Otago**
Date Issued 09 October 2009

Prior References
402953 OT13D/1013

Estate Fee Simple
Area 6.0004 hectares more or less
Legal Description Lot 1, 3 Deposited Plan 420009

Original Registered Owners

Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald

Interests

Appurtenant hereto is a right to drain sewage created by Transfer 372527

544716 Gazette Notice declaring a portion of State Highway No. 6 fronting the within land to be a limited access road - 11.11.1980 at 2:46 pm

Appurtenant to part formerly Lot 1 DP 22109 is a right to convey electricity & place transformer and appurtenant hereto is a right to convey water specified in Easement Certificate 789816.5 - 8.10.1991 at 10:46 am

Subject to a right to convey water over part marked marked c-d on DP 420009 specified in Easement Certificate 789816.5 - 8.10.1991 at 10:46 am

The easements specified in Easement Certificate 789816.5 are subject to Section 309 (1) (a) Local Government Act 1974

Appurtenant to Lot 3 & part Lot 1 DP 420009 (formerly Lot 3 DP 22109) is a right to convey water created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am

Appurtenant to Lot 3 & part Lot 1 DP 420009 (formerly Lot 3 DP 22109) are rights to convey, store and take water, a right to convey electricity and telecommunications cables and a right to pump water created by Easement Instrument 7073932.5 - 17.10.2006 at 9:00 am

8287639.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 9.10.2009 at 3:58 pm

5789049.5 Mortgage to Southland Building Society - 6.11.2003 at 9:00 am (affects L3 DP 420009)

Subject to Section 241(2) and Section 242(1) Resource Management Act 1991(affects DP 420009)

Appurtenant hereto is a right of way created by Easement Instrument 8287639.7 - 9.10.2009 at 3:58 pm

The easements created by Easement Instrument 8287639.7 are subject to Section 243 (a) Resource Management Act 1991

8345047.1 Discharge of Mortgage 5789049.5 - 17.12.2009 at 12:39 pm

9850689.4 Variation of the conditions of the easement created by Easement Instrument 8287639.7 - 30.9.2014 at 10:02 am

10181959.1 Mortgage to Bank of New Zealand - 9.9.2015 at 11:19 am



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 **476974**

Land Registration District **Otago**

Date Issued 09 October 2009

Prior References

402953 OT13D/1013

Estate Fee Simple
Area 2.6794 hectares more or less
Legal Description Lot 2, 4 Deposited Plan 420009

Original Registered Owners

Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald

Interests

The easements specified in Easement Certificate 789816.5 are subject to Section 309 (1) (a) Local Government Act 1974
Subject to a right to convey water over part marked d-e & f-g on DP 420009 specified in Easement Certificate 789816.5 - 8.10.1991 at 10:46 am

Appurtenant to part formerly Lot 1 DP 22109 is a right to convey electricity & place transformer and appurtenant hereto is a right to convey water specified in Easement Certificate 789816.5 - 8.10.1991 at 10:46 am

Appurtenant hereto are rights to convey water created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am

Appurtenant hereto are rights to convey, store and take water, a right to convey electricity and telecommunications cables and right to pump water created by Easement Instrument 7073932.5 - 17.10.2006 at 9:00 am

8287639.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 9.10.2009 at 3:58 pm

8287639.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 9.10.2009 at 3:58 pm (affects Lot 2 DP 420009)

5789049.5 Mortgage to Southland Building Society - 6.11.2003 at 9:00 am (affects Lot 2 DP 420009)

Appurtenant hereto is a right to drain sewage created by Transfer 372527 - 18.8.1971 at 9:00 am

544716 Gazette Notice declaring a portion of State Highway No. 6 fronting the within land to be a limited access road - 11.11.1980 at 2.46 pm

Subject to Section 241(2) and Section 242(1) Resource Management Act 1991(affects DP 420009)

Appurtenant hereto is a right of way created by Easement Instrument 8287639.7 - 9.10.2009 at 3:58 pm

The easements created by Easement Instrument 8287639.7 are subject to Section 243 (a) Resource Management Act 1991

8345047.1 Discharge of Mortgage 5789049.5 - 17.12.2009 at 12:39 pm

Subject to a right to convey water over part Lot 2 marked A and B and to convey telecommunications over part Lot 2 marked A both on DP 425155 created by Easement Instrument 8345047.2 - 17.12.2009 at 12:39 pm

8345047.3 Mortgage to Southland Building Society - 17.12.2009 at 12:39 pm

8696855.1 CERTIFICATE PURSUANT TO SECTION 77 BUILDING ACT 2004 THAT THIS COMPUTER REGISTER

IS SUBJECT TO THE CONDITION IMPOSED UNDER SECTION 75(2) - 15.2.2011 at 2:07 pm

9507954.2 CAVEAT BY AURORA ENERGY LIMITED - 6.9.2013 at 10:16 am

9850689.2 Withdrawal of Caveat 9507954.2 - 30.9.2014 at 10:02 am

9850689.4 Variation of the conditions of the easement created by Easement Instrument 8287639.7 - 30.9.2014 at 10:02 am

Appurtenant hereto is a right to overhang created by Easement Instrument 9850689.6 - 30.9.2014 at 10:02 am

10782329.1 Discharge of Mortgage 8345047.3 - 19.5.2017 at 7:44 am

Approvals for the Ottago Area
Health Board
Registered Owners

The Central Ottago District Council certifies that:
(1) This plan of subdivision is approved pursuant to section 105(1) of the Local Government Act 1974 under delegated authority pursuant to section 105 of the said Act.
(2) The plan is in accordance with a specific allocation made in the 1974 Act.
(3) The plan is in accordance with a specific allocation made in the 1974 Act.
(4) The plan is in accordance with a specific allocation made in the 1974 Act.
(5) The plan is in accordance with a specific allocation made in the 1974 Act.

In the matter of Section 279(1)(b) of the Local Government Act 1974.
I do hereby certify that all conditions shown or referred to on the approved plan of subdivision have been satisfied and have been complied with to the satisfaction of the Central Ottago District Council. Dated this 4th day of May 1991.
Principal Officer of the Central Ottago District Council

Memorandum of Easements

Stream	Particulars	Survey Year	Thomson
A-B	Right to drain sewage	Lot 2 hereon	Lot 4 hereon
C-D	Right to drain sewage	Lot 3 hereon	Lot 4 hereon
E-F	Right to drain sewage	Lot 2 hereon	Lot 4 hereon
G-H	Right to drain sewage	Lot 2 hereon	Lot 4 hereon
I-J	Right to drain sewage	Lot 2 hereon	Lot 4 hereon
K	Right to drain sewage	Lot 2 hereon	Lot 4 hereon
L-M	Right to drain sewage	Lot 2 hereon	Lot 4 hereon

DATUM: GEODETIC 1949
CIRCUIT: LINDIS PEAK
COORDS: IN TERMS OF FALSE ORIGIN
700,000 N 300,000 E

Total Area 13.6592 ha
Computed in C.T. 204/76 AL. CT. 27/226 AL.

I, JAMES MARTIN PATER, of CROMWELL
Registered Surveyor and holder of an annual practicing certificate for who
do hereby certify that this plan has been made from surveys executed
by me or under my directions, that both plan and survey are correct and
have been made in accordance with the Survey Regulations 1972 or any
regulations made in substitution thereof.
Dated at Cromwell this 7th day of May 1991
of James Martin Pater
Registered Surveyor

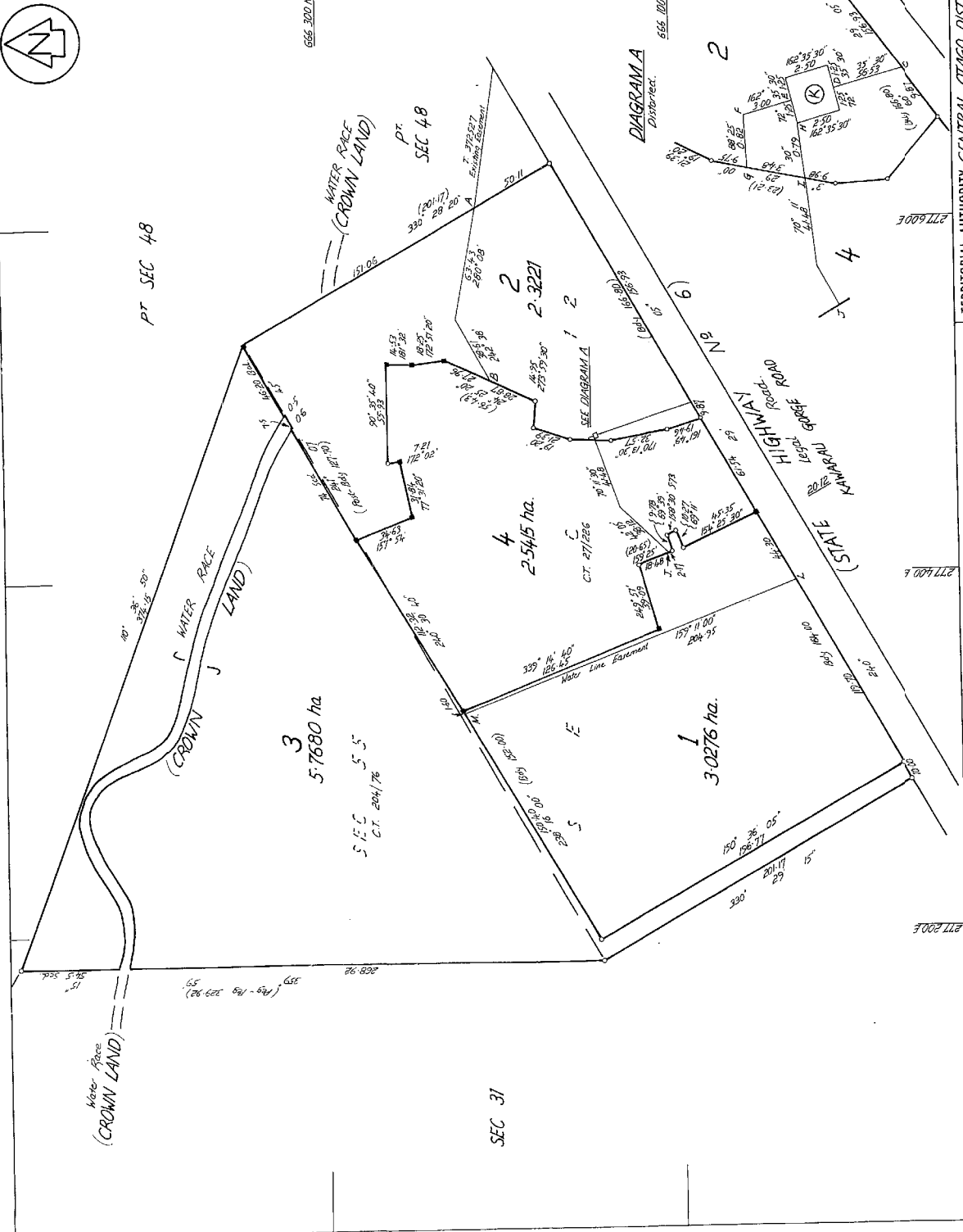
Field Book 20452 p. 95-40 Traverse Book 254 p. 85-87
Reference Plans S.O. 362, 3201, 20299, 21494

Examined under the 1974 Act
Approved as to Survey
7/8/91
Chief Surveyor

Deposited this 8 day of May 1991
District Land Registrar

File Number 2016/191
DP 22109

DOCS 11 SPEC. 010



LOTS 1-4 BEING SUBDN OF SECTIONS 12 & 55
Surveyed by PATERSON PITTS PARTNER LTD
Scale 1:1500 Date MAY 1991

LAND DISTRICT OTAGO
Survey Blk. & Dist. III CROMWELL
NZMS 261 Sheet F4/ Record Map No. B.3 & 40/15

TERRITORIAL AUTHORITY CENTRAL OTAGO DIST.
Surveyed by PATERSON PITTS PARTNER LTD
Scale 1:1500 Date MAY 1991

W.A. ROBERTSON, DIRECTOR GENERAL, SURVEY AND INSPECTION, DEPARTMENT OF SURVEY AND INSPECTION, NEW ZEALAND



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy




R.W. Muir
Registrar-General
of Land

Identifier **OT13D/1015** **Cancelled**

Land Registration District **Otago**

Date Issued 08 October 1991

Prior References

OT204/76 OT27/226

Estate Fee Simple
Area 5.7680 hectares more or less
Legal Description Lot 3 Deposited Plan 22109

Original Proprietors

Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Raymond Murray Blake

Interests

Appurtenant hereto is a right to drain sewage over part CsT OT197/39, OT9/211, OT181/43, OT3B/488 and OT327/170 shown as a blue line on the diagram annexed to Transfer 372527 created by the said Transfer

544716 Gazette Notice declaring a portion of State Highway No. 6 fronting the within land to be a limited access road - 11.11.1980 at 2.46 pm

789816.5 Easement Certificate specifying the following easements - 8.10.1991 at 10.46 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 1 Deposited Plan 22109 - CT OT13D/1013	L-M DP 22109	Lot 3 Deposited Plan 22109 - herein	Local Government Act 1974 Section 309(1)(a)

5789049.5 Mortgage to Southland Building Society - 6.11.2003 at 9:00 am

7073932.2 Transfer to Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald - 17.10.2006 at 9:00 am

Appurtenant hereto is a right to convey water created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am

Appurtenant hereto are rights to convey, store and take water, a right to convey electricity and telecommunications cables and a right to pump water created by Easement Instrument 7073932.5 - 17.10.2006 at 9:00 am

7694190.3 CT 402953 issued - 28.1.2008 at 9:00 am.

CANCELLED

References

Prior C/T 27/226, 204/76

Transfer No

N/C Order No. 789816/3

Land and Deeds 69



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 8th day of October one thousand nine hundred and ninety one under the seal of the District Land Registrar of the Land Registration District of O T A G O

WITNESSETH that THE OTAGO AREA HEALTH BOARD a body corporate formed pursuant to the Area Health Boards Act 1983

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 5.7680 hectares more or less being Lot 3 Deposited Plan 22109 and being part Sections 12 and 55 Block III CROMWELL DISTRICT

Interests at date of issue:

[Signature]
ASSISTANT LAND REGISTRAR

Appurtenant hereto is a right to drain sewage over part Cs.T 197/39, 9/211, 181/43, 3B/488 and 327/170 shown as a blue line on the diagram annexed to Transfer 372527 created by said transfer

544716 Gazette Notice declaring a portion of State Highway No. 6 fronting the within land to be a limited access road - 11.11.1980 at 2.46pm (Page 5)

801613/1 Transfer to Henry Theodore Van Der Velden and Pamela Faye Van Der Velden both of Cromwell real estate agents - 27.3.1992 at 10.13 am

789816/5 Easement Certificate certifying that a right to convey water over part Lot 1 DP 22109 801613/2 Mortgage to Trust Bank (CT 13D/1013) marked "L-M" on DP 22109 appurtenant Otago Limited to Lot 3 DP 22109 (herein) - 8.10.1991 at 10.46am am

DISCHARGED
MAR 1992

The easement specified in Easement Certificate 789816/5 when created will be subject to Section 309(1)(a) Local Government Act 1974

963790.3 Transfer to Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Raymond Murray Blake 11.3.1999 at 9.05

Measurements are Metric
REDUCED PLAN OVERLEAF

No 13D / 1015

1470-25,000 5 56 MS

Register copy for 1 & 10 69 71 72

CERTIFICATE OF TITLE No 13D/1015

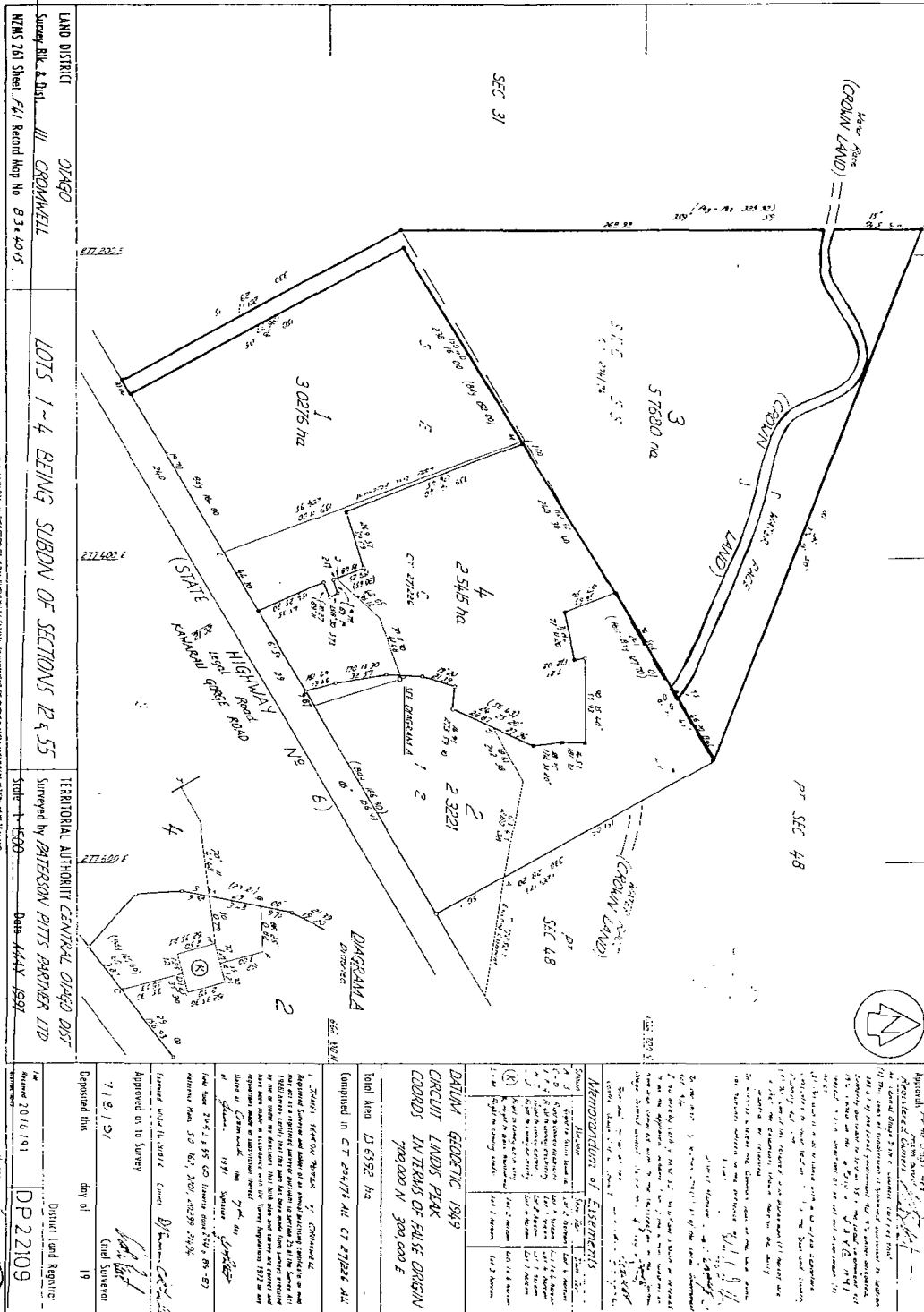


Image Quality due
to Condition
of Original



CANCELLED

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland, **Queen**:

Register Book.
Vol. 27. Folio. 226

27/226

Grant No. 17059

Public Revenue Act 1854 & 1862.

TO ALL to whom these presents shall come, Greeting:

Know Ye that for good considerations Us thereunto moving, We, for Us, our Heirs and Successors, do hereby grant unto the Superintendent of the Province of Otago and His Successors Superintendents of the

said Province: All that Parcel of Land in our Province of Otago in our Colony of NEW ZEALAND,

~~containing by admeasurement~~ situate in the Cromwell District being section numbered

Twelve (12) Block Three (III) on the map of the said District containing by admeasurement

Twenty (20) acres more or less bounded towards the North West by brown Lands two thousand

(2000) links towards the North East by brown

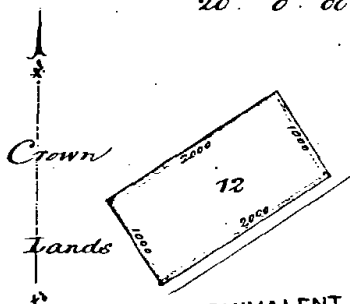
Lands One thousand (1000) links towards

the South East by a road line two thousand

(2000) links and towards the South West

by brown Lands One thousand (1000) links

Block III Cromwell Dist
20 0 00



EQUIVALENT METRIC
AREA IS 8.0937 ha

Scale: 10 Chains = 1 inch

Surveyed by A. R. Mackay
S. D. Comr. of Crown Lands
McKenzie Chief Surveyor

As the same is delineated on the Plan drawn in the margin hereof, WITH all the Rights and Appurtenances thereto belonging: To Hold unto the said Superintendent of the Province of Otago and his Successors in trust, as a site for a public hospital

Wan Plan 22109

In Testimony Whereof We have caused this our GRANT to be sealed with the Seal of our Colony of NEW ZEALAND.

Witness

our Right Trusty and Entirely Beloved Cousin and Councillor, GEORGE AUGUSTUS CONSTANTINE, Marquis of Normandy, Earl of Mulgrave, Viscount Normandy, and Baron Mulgrave of Mulgrave, all in the County of York, in the Peerage of the United Kingdom, and Baron Mulgrave of New Ross, in the County of Westford, in the Peerage of Ireland, a Member of our Most Honorable Privy Council, Knight Commander of our Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over our Colony of New Zealand and its Dependencies, and Vice-Admiral of the same, at Wellington

this eleventh day of July in the fourth year of our Reign, and in the year of our Lord one thousand eight hundred and seventy.

No. 17927
Reg. 6.69

[Signature]

18161

27/226.

The riparian land was vested by Section 178, 27/226
of the Reserves and other Lands Disposal
Act, 1924 in the Vincent Hospital
Board in trust as a site for a public
hospital. Entered 5th September 1938 at
30c.

Appropriate here is a right to drain
waste & over part est. 1973, 9/10, 18/11/73.
32/100 and 327/110 created by Transfer
372527
K.S. 1971, AIR

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.

J. L. McBurney L.R.

544716 Gazette Notice declaring a portion
of State Highway No 6 fronting the within
land to be a limited access road -
11.11.1980 at 2.46pm (page 5)

A.L.R.

The easements specified in the Memorandum
on DP 22109 are required to be created pursuant
to Section 309(1)(c) Local Government Act
1974

789816/1) New CT 13D/1013 issued for Lot 1
8.10.1991) DP 22109

789816/2) New CT 13D/1014 issued for the
8.10.1991) Part Lot 2 DP 22109 herein

789816/3) New CT 13D/1015 issued for the
8.10.1991) Part Lot 3 DP 22109 herein

789816/4) Cancelled and New CT 13D/1016
8.10.1991) issued for the Part Lot 4 DP
22109 herein

DUPLICATE DESTROYED

5/11/1991

DISTRICT LAND
REGISTRAR

Cancelled

OTAGO
NEW ZEALAND

Entered at o'clock on the
day of

187

DISTRICT LAND REGISTRAR.

DATED 11th July 1876
20 A. 0 R. 00 P.

Registration District of Otago

Grant

TO
The Superintendent of Otago

ENTERED in Reg. No. P. 6.

Folio 15

27 July 1876

J. L. McBurney
COMMISSIONER OF CROWN LANDS.

ENTERED on Record this 15th

day of July 1876

Reg. No. B. 69

Folio 55

J. L. McBurney
SECRETARY FOR CROWN LANDS.



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy




R.W. Muir
Registrar-General
of Land

Identifier

OT204/76

Cancelled

Land Registration District **Otago**

Date Issued 06 March 1924

Prior References

W4/233

Interests

Appurtenant hereto is a right to drain sewage created by Transfer 372527

789816.2 CT OT13D/1014 issued for part Lot 2 DP 22109 herein - 8.10.1991

789816.3 CT OT13D/1015 issued for part Lot 3 DP 22109 herein - 8.10.1991

789816.4 CT OT13D/1016 issued for part Lot 4 DP 22109 herein - 8.10.1991

7700739.1 Departmental dealing uncancelling the within title, adding structured data, memorials, registered proprietor (being The Vincent Hospital Board) and legal description (being Section 55 Block III Cromwell District comprising 5.5644 hectares) - 25.1.2008 at 4:00 pm

7694190.1 Transmission to The Crown Health Financing Agency - 28.1.2008 at 9:00 am

7694190.2 Transfer to Henry Theodore Van Der Velden, Pamela Faye Van Der Velden and Neil Christopher MacDonald - 28.1.2008 at 9:00 am

7694190.3 CT 402953 issued - 28.1.2008 at 9:00 am.

CANCELLED

Image Quality due
to Condition
of Original

CANCELLED
NEW ZEALAND.

(L.T.-26.

[SCHEDULE 1.

Warrant No. 4/233
Reference: P.R. folio
Transfer No.



OFFICE.

Register-book.

Vol. 204 folio 76

204/76

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

Handwritten note:
This Certificate, dated the 19th day of March, 1924, one thousand nine hundred and twenty-four, being a Certificate in lieu of Grant, under Warrant of His Excellency the Governor, in exercise of the powers enabling him in that behalf, Admits that the VINCENT HOSPITAL AND CHARITABLE AID BOARD is seized of an estate in fee simple in trust for Hospital purposes

This Certificate, dated the 19th day of March, one thousand nine hundred and twenty-four, being a Certificate in lieu of Grant, under Warrant of His Excellency the Governor, in exercise of the powers enabling him in that behalf, Admits that the VINCENT HOSPITAL AND CHARITABLE AID BOARD is seized of an estate in fee simple in trust for Hospital purposes

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 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, which said land is in the said Warrant expressed to have been originally acquired by Vincent Hospital and Charitable

Aid Board

as from the Twentieth day of December, one thousand nine hundred and twenty-three under Section 323 of "The Land Act 1908" that is to say: All that parcel of land containing thirteen acres and three rods more or less being Section fifty-five (55) Block Three (III) on the public maps of Cromwell District.



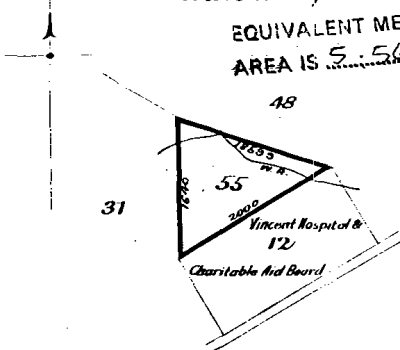
Mr. Philip Morgan
District Land Registrar.

In trust for Hospital purposes

Block III Cromwell District

d.w. 19a. 1r. 03p
13a. 3r. 00p.

EQUIVALENT METRIC
AREA IS 5.56 hectares



New Plan 22109

Scale 10 Chains to an Inch
Compiled from official surveys
Chief Surveyor R. S. Galtbraith
Draughtsman J. McEwen

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.
J. Galtbraith A.L.R.

The easements specified in the Memorandum on DP 22109 are required to be created pursuant to Section 309(1)(c) Local Government Act 1974

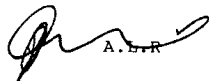
789816/2) New CT 13D/1014 issued for the
8.10.1991) Part Lot 2 DP 22109 herein

789816/3) New CT 13D/1015 issued for
8.10.1991) the Part lot 3 DP 22109 herein

over...

CT 204/76

789816/4) Cancelled and New CT 13D/1016 issued
8.10.1991) for the part Lot 4 DP 22109 herein


A.L.R.

DUPLICATE DESTROYED

5 11 1991



Appendix D:
Historic Aerials

1950

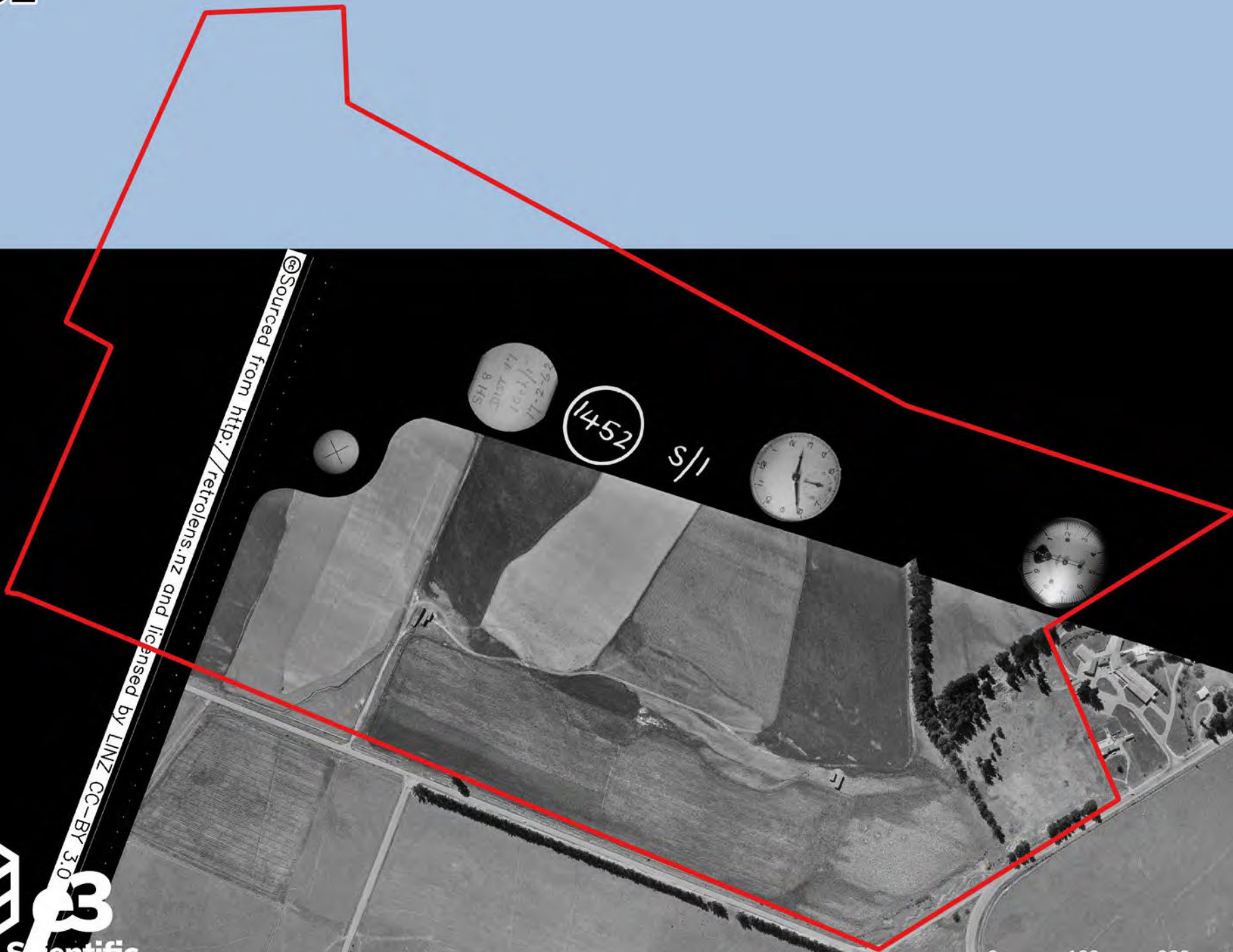




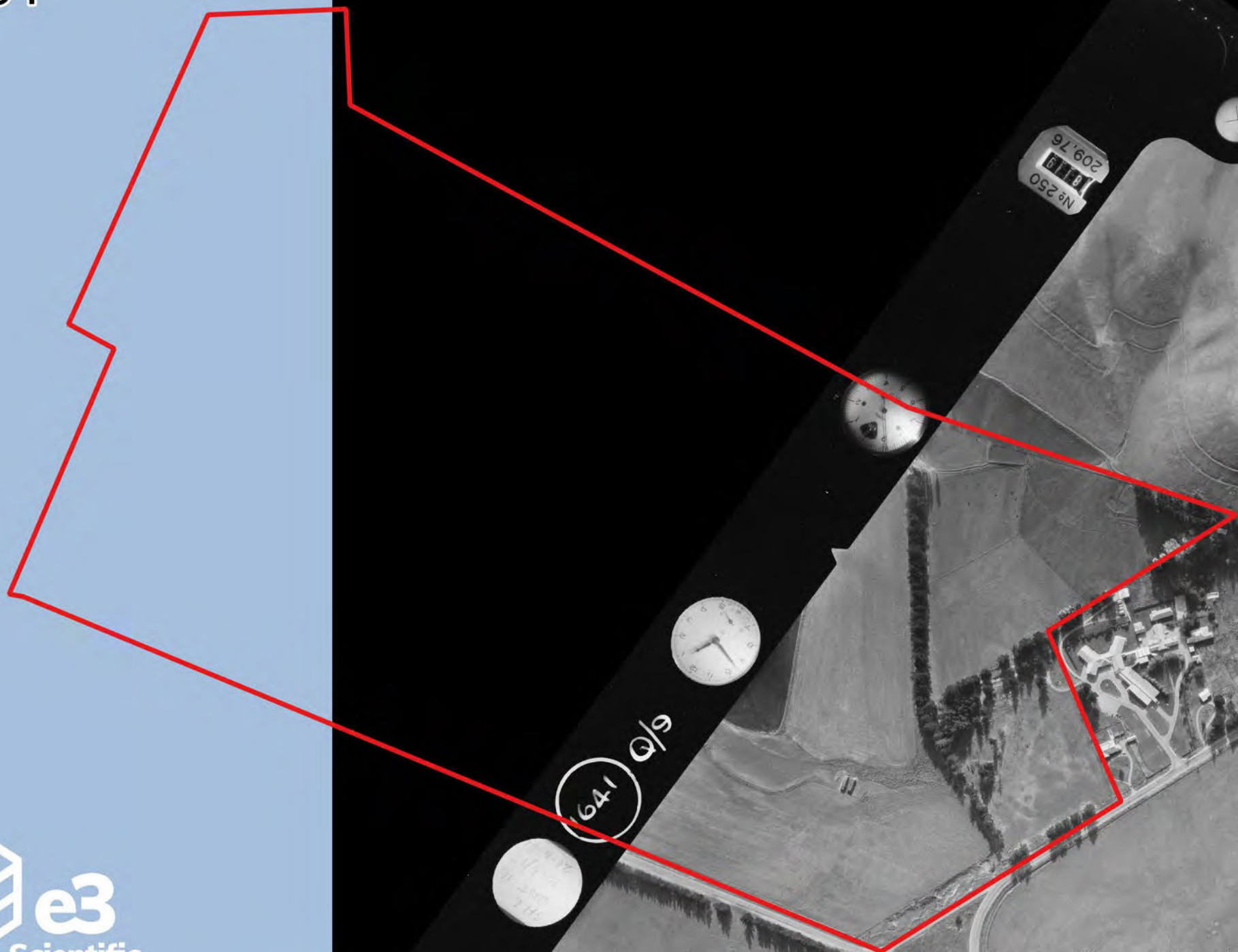
1958



1962



1964



No 250
6119
209.76

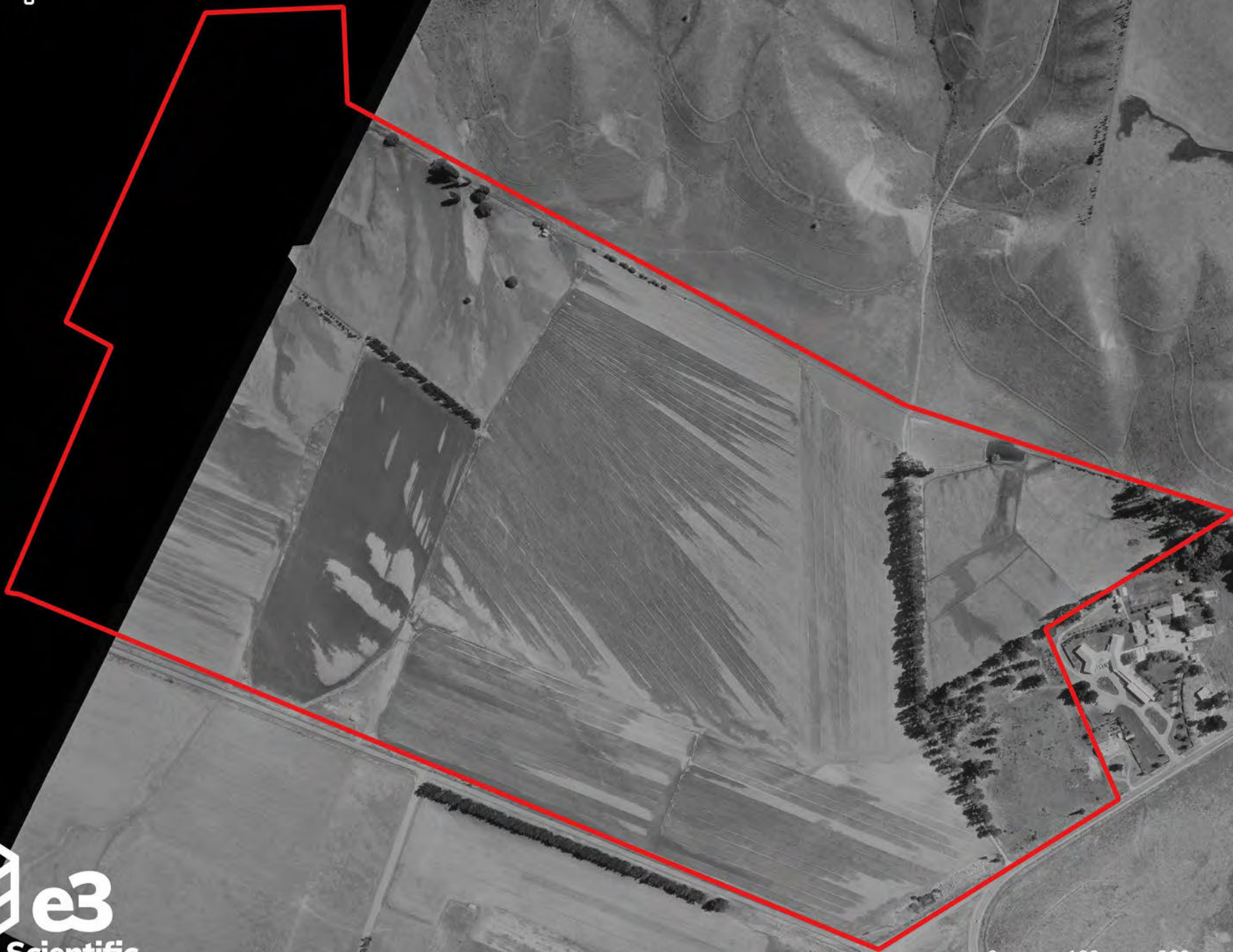
1641 Q/9



Map data (c) CC BY 4.0 Land Information New Zealand (LINZ)



1974



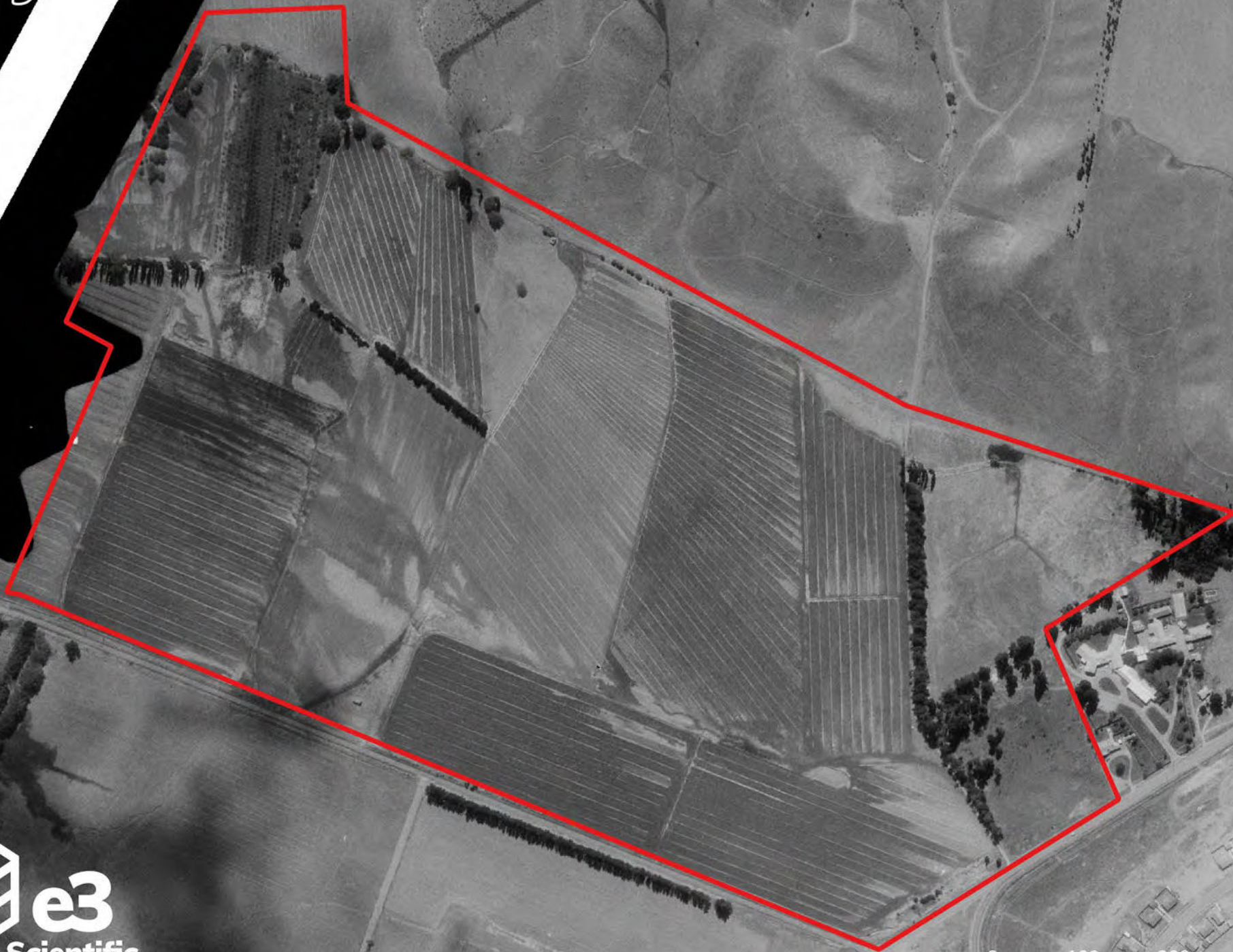
1975



1978



1979



1982



1983



1984



1985



2001



2003



Map data (c) CC BY 4.0 Land Information New Zealand (LINZ)



2011



2013



2018



2019



2021



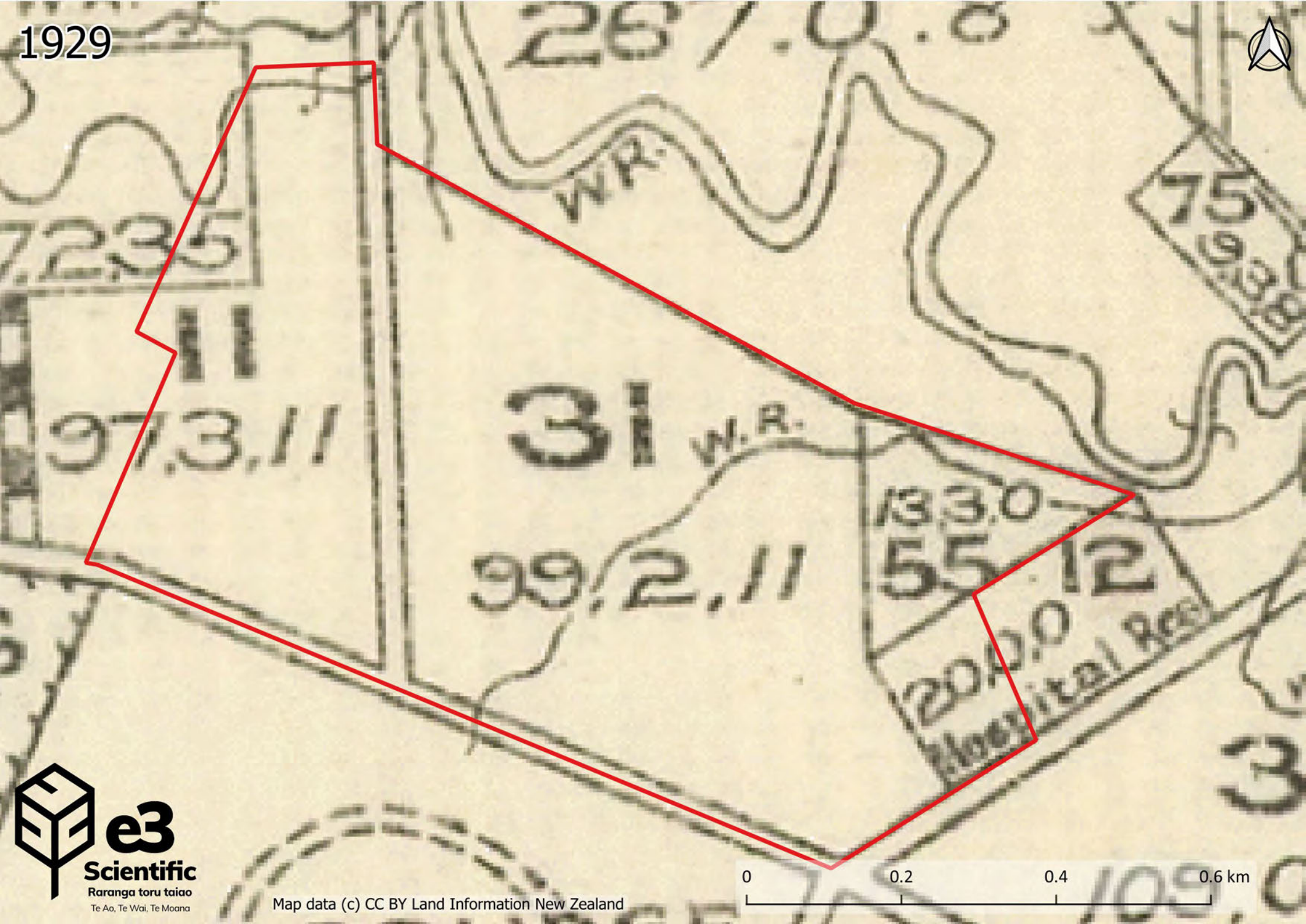
2022



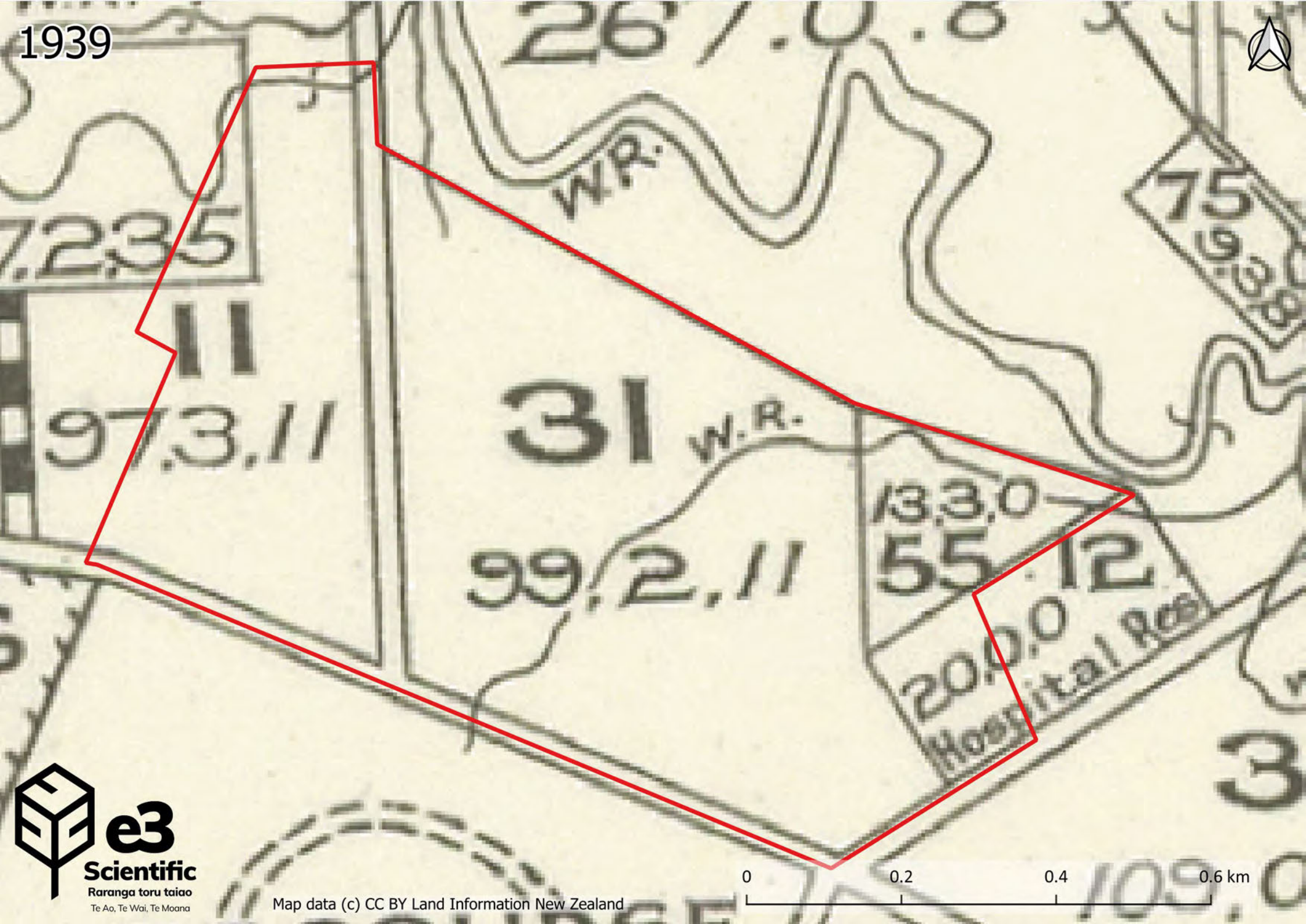
2023



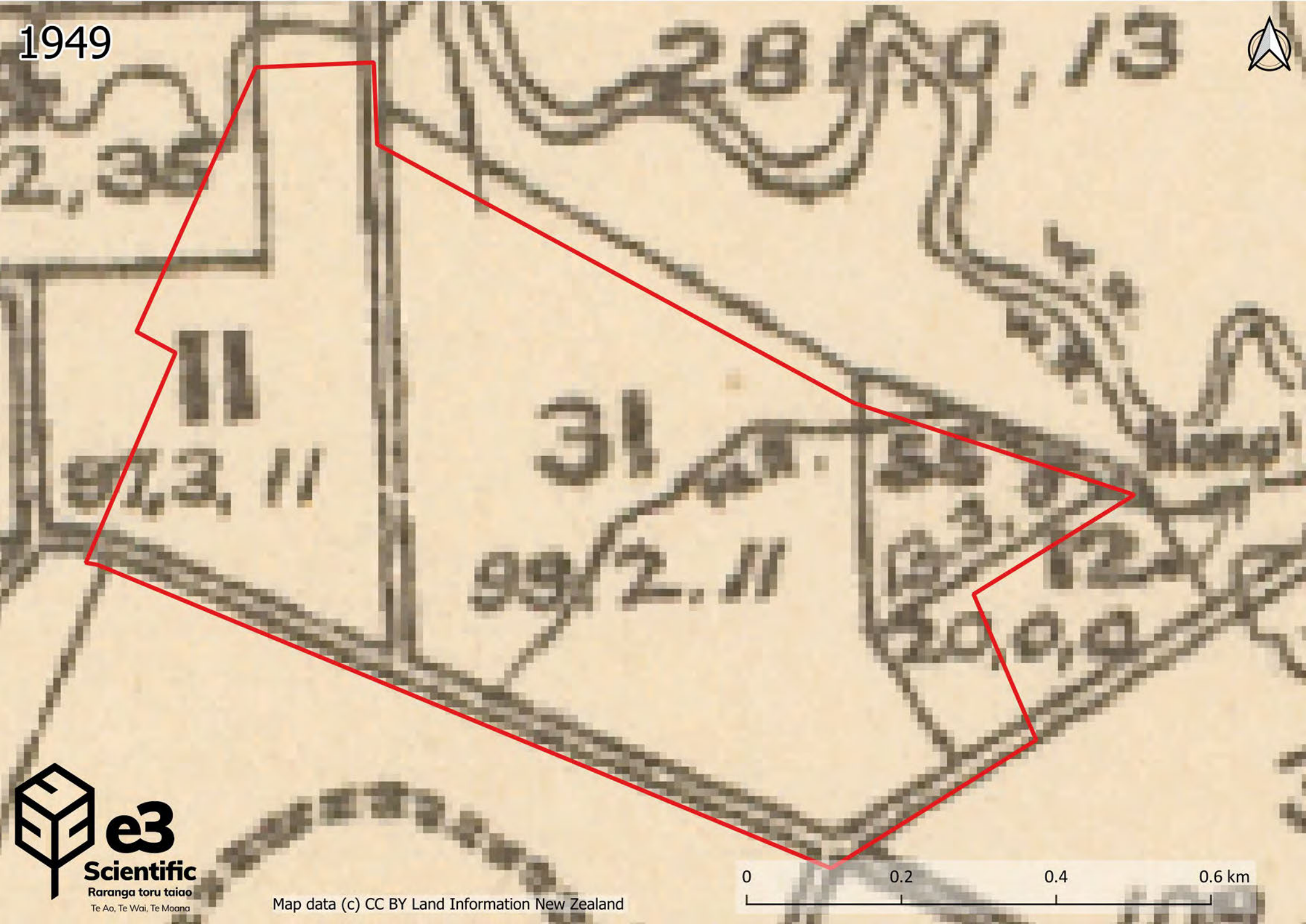
1929



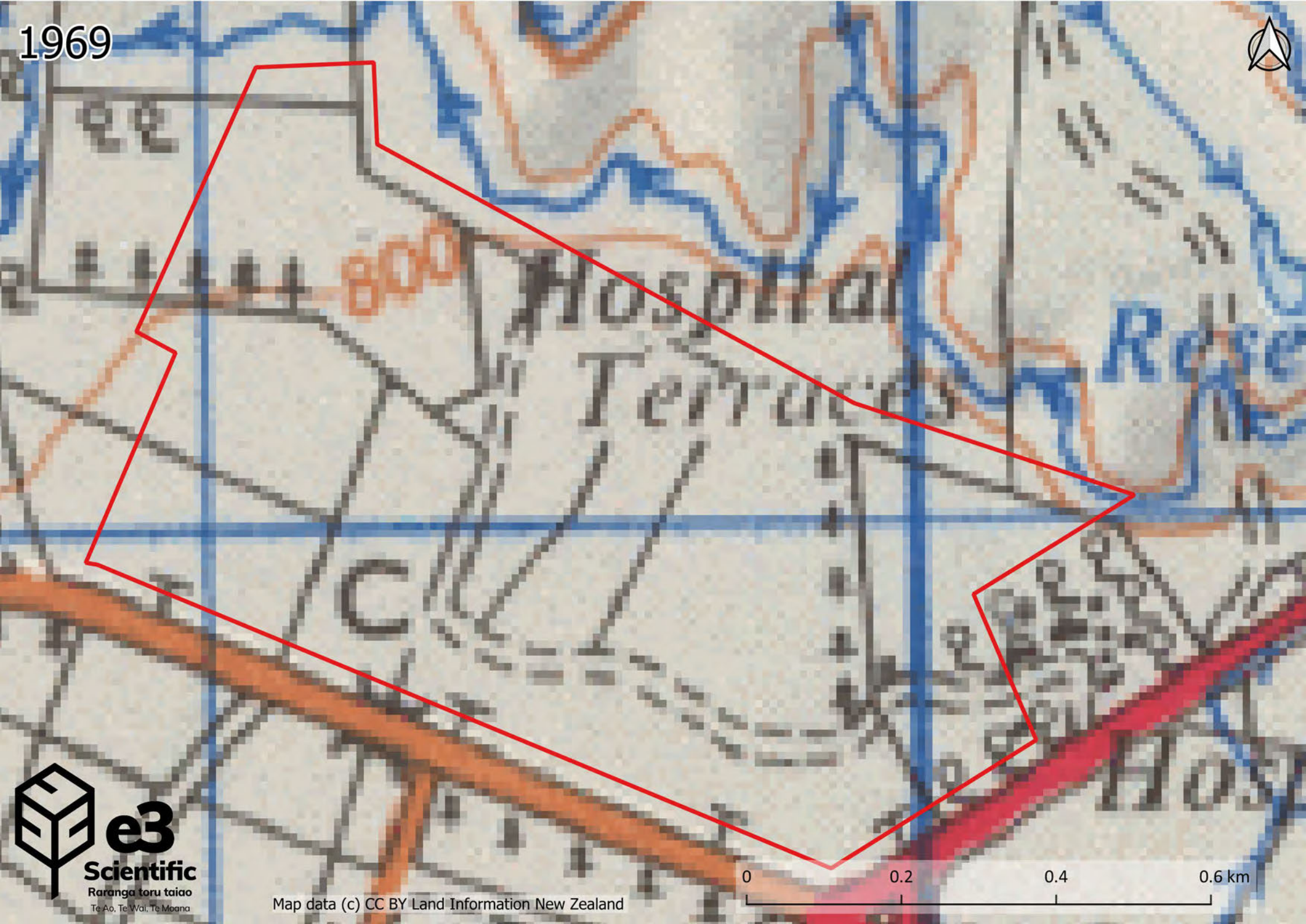
1939



1949



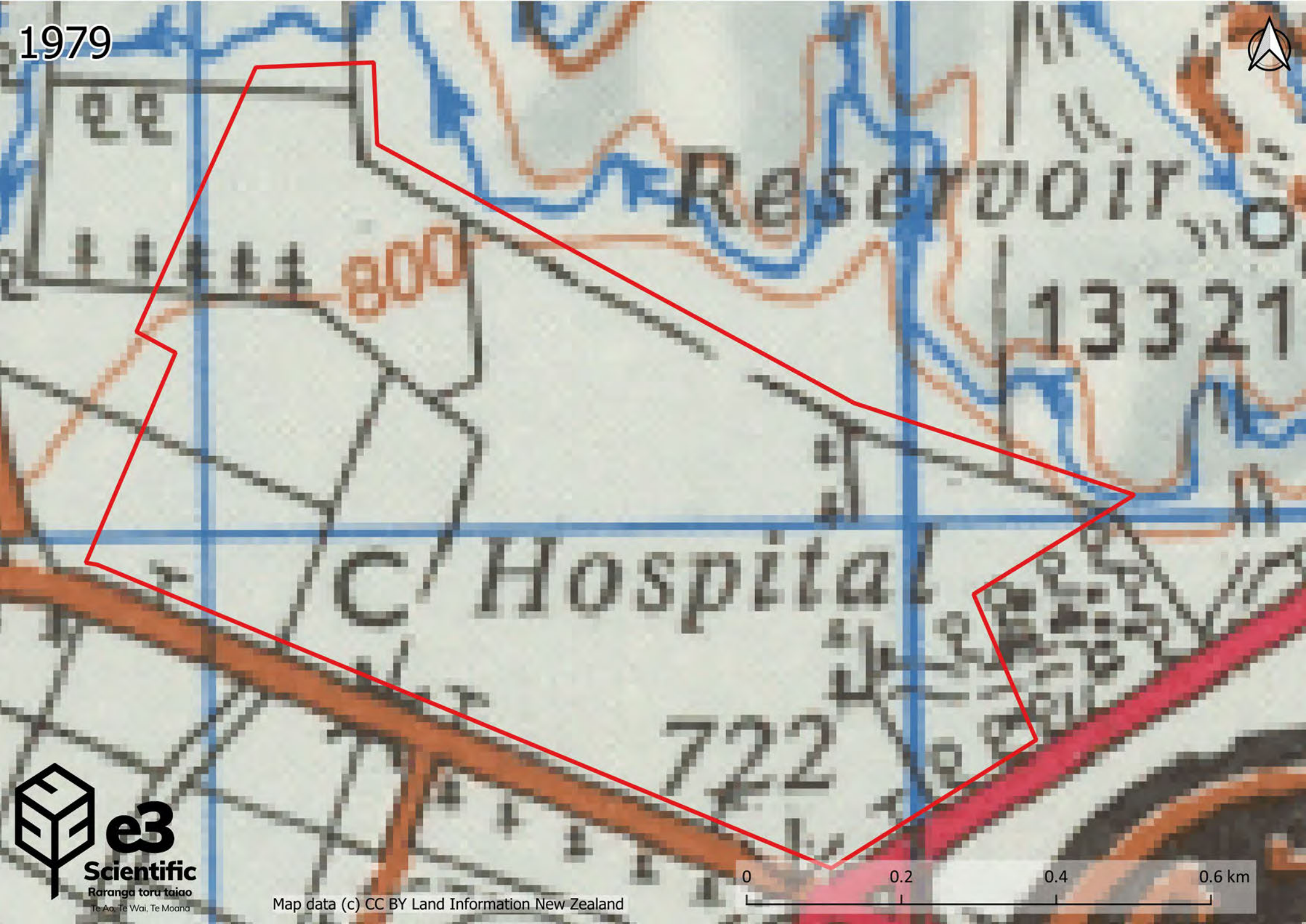
1969



Map data (c) CC BY Land Information New Zealand



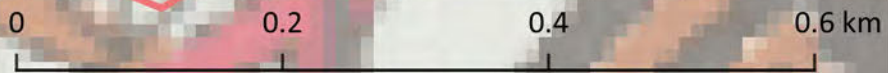
1979



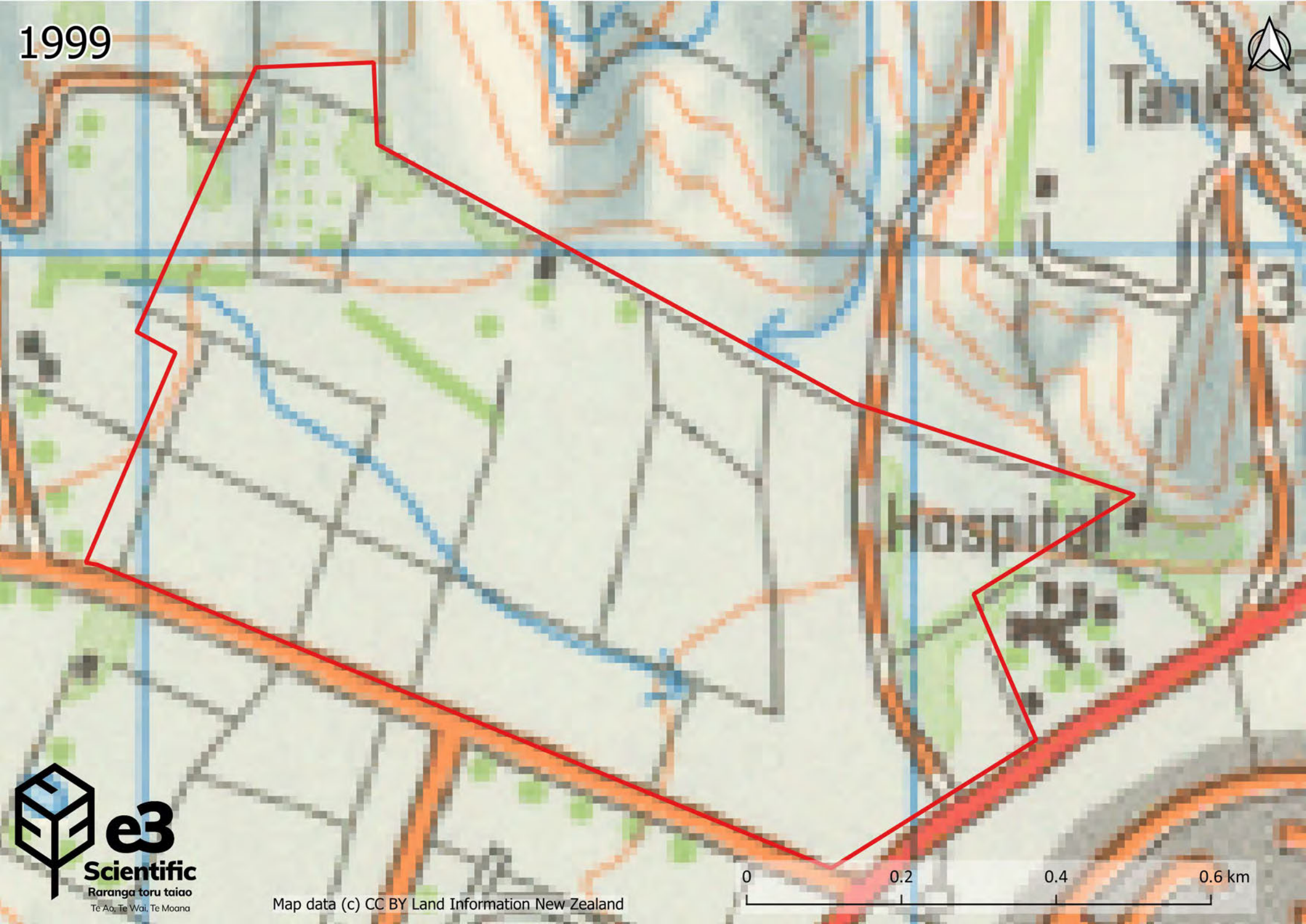
1989



Map data (c) CC BY Land Information New Zealand



1999



2019



Map data (c) CC BY Land Information New Zealand



Appendix E:

District Council Supporting Information

NES RECORD SEARCH

Application

Simon David Beardmore 4A Briar Crescent, Alexandra 9320	Number Application date Phone Mobile Email	NES260002 19/01/26 s 9(2)(a) s 9(2)(a)
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Property

Valuation No.	2842121601
Location	100 & 116 Kawarau Gorge Road (State Highway 6)
Legal Description	Lots 1 - 5 DP 420009
Area (hectares)	9.0177

Resource consents

Resource Area: Rural Resource Area (Rural Residential)

Consents:

28/08/2013	RC 130164: s127 application to amend RC120293 condition 1 to provide for an extension to the existing shed that breaches minimum yard requirements <i>The planner's report for this amendment indicates that the shed and its extension support a productive cherry operation on-site. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
6/12/2012	RC 120222: Land use consent to establish workers accommodation within an existing shed on Lots 2 & 4 DP 420009 <i>The planner's report for this application indicates that the workers accommodation operation supports a productive cherry operation on-site. The planners report indicates that, at the time of processing, Aphidex (pirimicarb) was applied to orchard trees once a year. On the basis that Aphidex was not a persistent pesticide, the NES-CS was not considered to be applicable to the application. If persistent pesticides have been applied, they are Item A10 on the HAIL and may trigger NESCS requirements.</i>
6/12/2012	RC 120205: Land use consent to establish workers' accommodation within an existing shed <i>The application for this land use consent application indicates that the workers accommodation operation would support a productive cherry operation on-site. Horticultural operations can include the bulk storage and application of persistent pesticides, which is item A10 on the HAIL and may trigger NESCS requirements.</i> <i>Note: The land use consent was returned as incomplete.</i>
15/11/2011	RC 110213: Land use consent to construct a cool store that breaches the colour palette and an extension to an existing shed that breaches the minimum yard. <i>The planner's report for this land use consent indicates that the shed extension and cool store support a productive cherry operation on-site. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
19/11/2010	RC 100293: Retrospective land use consent to breach yards and land use consent to extend shed that will breach yards <i>The planner's report for this land use consent indicates that the shed and its extension support a productive cherry operation on-site. Horticultural operations can include the</i>

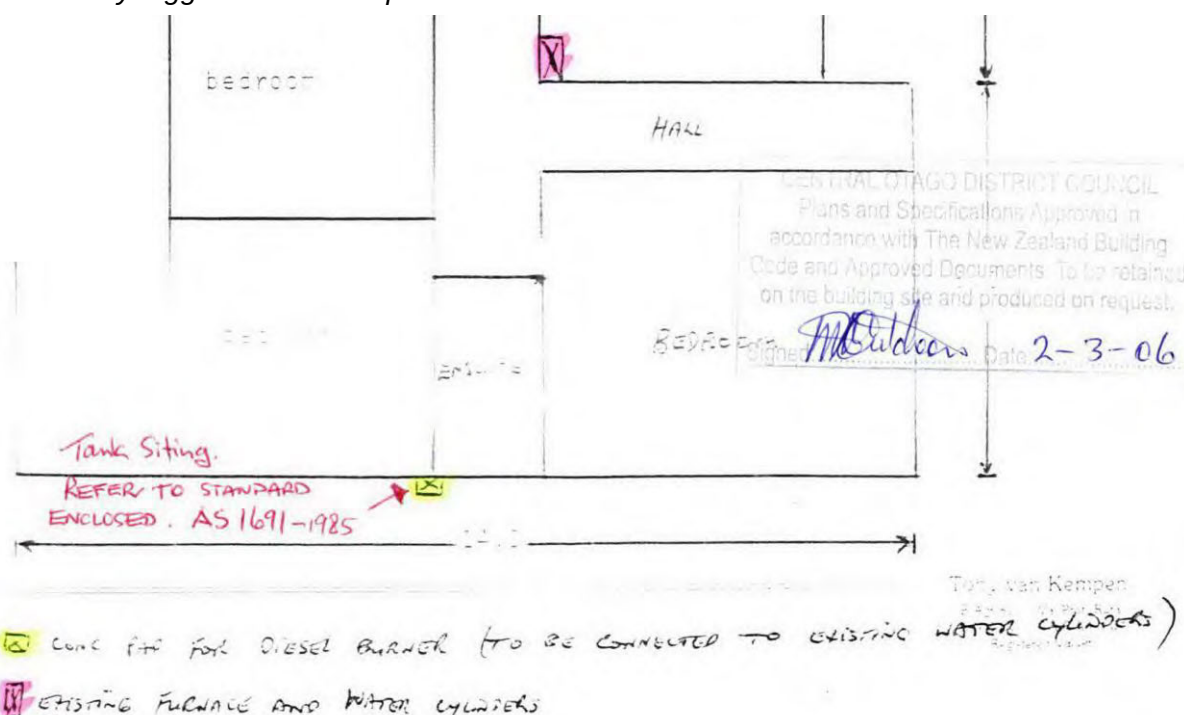
	<i>bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
14/09/2009	RC 090036: Subdivision boundary adjustment with a dwelling surplus to requirements <i>The application and planner's report indicates that the subject site has been used for cherry operations. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
14/09/2009	RC 090010: Subdivision boundary adjustment in the Rural Residential Resource Area <i>The application and planner's report indicate that the subject site has been used for cherry operations. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
27/08/2004	RC 040077: Certificate of Compliance to cover part of the cherry orchard with red coloured protective canopy net, 16mm Quad Crossover. <i>The application indicates the subject site has been used as a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
20/03/1991	H023456 / 28421/216: Consent to subdivide Pt Section 12 Block III Cromwell Survey District into 2 allotments to contain Doctors residence and Gardeners cottage being surplus to requirement. <i>No information in relation to HAIL activities could be found on this record.</i>

Building

Consents/Permits/Compliance Schedules:

16/12/2013	BC 130457: Additions to existing shed. <i>The plans and specifications indicates the subject site has been used as a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
12/12/2013	BC 130451: Install a new in-built Masport fire <i>No information in relation to HAIL activities could be found on this record.</i>
24/04/2013	BC 120698: Covert part of packing shed to workers accommodation <i>The application indicated that only part of an existing packing shed would be converted to support workers' accommodation. Packing shed can be associated with horticultural operations, which in turn can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements</i>
20/08/2012	BC 110750: Additions and alterations to two existing sheds and erect a new cool store <i>No information in relation to HAIL activities could be found on this record.</i>
07/10/2012	BC 110744: Erect a new cool store <i>The application indicated that the subject site has been used as a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i> <i>Note: this building consent was cancelled</i>
07/10/2012	BC 110745: Additions and alterations to two existing sheds. <i>The application indicated that the subject site has been used as a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i> <i>Note: this building consent was cancelled</i>
06/12/2010	BC100601 Additions to existing shed <i>No information in relation to HAIL activities could be found on this record.</i>

24/11/2010	BC 100406 Plumbing and drainage field for existing shed <i>The application indicated that the subject site shas been used as a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
24/11/2010	BC 090128: Erect a new implement shed. <i>No information in relation to HAIL activities could be found on this record.</i>
14/06/2010	BC 090399: Alterations to existing dwelling <i>No information in relation to HAIL activities could be found on this record.</i> <i>Note: This application was withdrawn before being determined.</i>
02/03/2006	BC 060075: Install a new diesel boiler <i>Information provided in support of this application indicates the presence on an above ground diesel tank on the property. Fuel storage tanks are Item A17 on the HAIL and may trigger NES-CS requirements.</i>



10/06/2004	BC 040385: Alterations to existing verandah <i>No information in relation to HAIL activities could be found on this record</i>
27/11/2002	Building Consent Exemption: Crop protection canopy <i>The application indicated that the subject site had been used for a cherry orchard. Horticultural operations can include the bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NESCS requirements.</i>
06/08/1992	BP K30415: Alterations and extensions to dwelling, build double garage and sleepout <i>No information about HAIL activities could be found on this record.</i>

Preliminary Site Investigations and Detailed Site Investigations

No information in relation to the above could be found on Council's records on the site.

Aerial Photographs

Council's aerial photographs for the site date back to 2003. Council's records indicate that the site has been used for horticultural activities. Bulk application of persistent pesticides can be associated with horticultural activities. This is Item A10 on the HAIL and may trigger NES-CS requirements.

Other Land Features

No information in relation to the above could be found on Council's records on the site.
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Disclaimer: The Council does not hold records directly relating to activities on the Hazardous Activities and Industries List (HAIL). In the event some information is available it cannot be guaranteed as correct or complete and therefore may not satisfy your request. We therefore recommend you undertake further investigation to determine whether any HAIL activities exist on the site.

Prepared by



Adam Vincent
Planning Officer
Date: 4 February 2026

NES RECORD SEARCH

Application

Simon David Beardmore 4A Briar Crescent, Alexandra 9320	Number Application date Phone Mobile Email	NES260003 19/01/26 s 9(2)(a) s 9(2)(a)
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Property

Valuation No.	2842121801
Location	16 Ripponvale Road, Cromwell
Legal Description	Lots 1, 2, 3 and 4 DP 344529
Area (hectares)	32.0658

Resource consents

Resource Area: Rural Resource Area

Consents:

- 22/05/2012 RC 120069: Land use consent for frost protection fan within 300m of a residential resource area
Information provided with this application indicates that the site has been used for horticultural activities and may include above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.
Note: This consent was withdrawn before being determined
- 24/09/2009 RC 090177: Land use consent to erect wind machine within 10m of a boundary
Information provided with this application indicates that the site has been used for horticultural activities and may include above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.
- 25/07/2006 RC 060049: Land use consent for hoarding signage
Information provided with this application indicates that the site was being developed for horticultural activities. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NES-CS requirements.
- 14/09/2004 RC 040269: Four lot rural subdivision
No information in relation to HAIL activities could be found on this record.

Building

Consents/Permits/Compliance Schedules:

- 20/08/2014 BC 140538: New wind machine foundation
Information provided with this application indicates that the site has been used for horticultural activities and above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.
- 04/10/2011 BC 110695: Erect new shed

	<i>Information provided with this application indicates that the site has been used for horticultural activities. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL and may trigger NES-CS requirements.</i>
06/08/2009	BC 090478: Erect wind machine <i>Information provided with this application indicates that the site has been used for horticultural activities and may include above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.</i>
03/08/2009	BC 090477: Erect wind machine <i>Information provided with this application indicates that the site has been used for horticultural activities and may include above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.</i>
03/08/2009	BC 090479: Erect a wind machine <i>Information provided with this application indicates that the site has been used for horticultural activities and may include above ground fuel tanks. Horticultural activities can include bulk storage and application of persistent pesticides, which is Item A10 on the HAIL. Fuel tanks are Item A17 on the HAIL, and may trigger NES-CS requirements.</i>
15/08/2005	BC 050517: Erect a new shed <i>No information in relation to HAIL activities could be found on this record.</i>

Preliminary Site Investigations and Detailed Site Investigations

No information in relation to the above could be found on this property.

Aerial Photographs

Council's aerial photographs for the site date back to 2003. Aerial photographs indicate that the site was developed for horticultural purposes between 2003 and 2006. In the 2003 aerial photographs, the site was used for pastoral land (Figures One and Two).



Figure One: Aerial photograph dated 2003 showing pastoral activities on the site



Figure Two: Aerial photograph dated 2006 showing the conversion of the site to horticultural use.

Bulk storage or application of persistent pesticides is Item A10 on the HAIL and may trigger NES-CS requirements.

Additionally, aerial photographs show unknown materials storage around the shed on the site. This may include bulk storage of chemicals, bulk storage of persistent pesticides or fuel tanks. These are Items A2, A10 and A17 on the HAIL respectively, and may trigger NES-CS requirements.



Figure Three: Aerial photograph dated 2025 showing unknown aerial storage around the shed.

Other Land Features

No information in relation to the above could be found on this property.

Disclaimer: The Council does not hold records directly relating to activities on the Hazardous Activities and Industries List (HAIL). In the event some information is available it cannot be guaranteed as correct or complete and therefore may not satisfy your request. We therefore recommend you undertake further investigation to determine whether any HAIL activities exist on the site.

Prepared by

Adam Vincent
Planning Officer - Consents
Date: 30 January 2026

NES RECORD SEARCH

Application

Simon David Beardmore
4A Briar Crescent, Alexandra 9320

Number	NES260004
Application date	19/01/26
Phone	
Mobile	s 9(2)(a)
Email	s 9(2)(a)

Property

Valuation No.	2842121800
Location	112 & 144 Ripponvale Road, Cromwell
Legal Description	Part Sections 5 and 25, Sections 4, 11, 26, 27, 28, 54, 96, 98, 99, 100, 101, 102 and 103 Block III Cromwell SD, Part Run 1201R, Lot 2 DP 330709
Area (hectares)	241.7995

Resource consents

Resource Area: Rural Resource Area (5), Rural Resource Area

Consents:

- 11/12/2025 RC 220396V4: Change to conditions of RC 220396
No information in relation to HAIL activities could be found on this record.
- 11/12/2025 RC 250169: Nine lot subdivision consent and land use consent to authorise buildings on lots potentially subject to hazards
No information in relation to HAIL activities could be found on this record.
- 26/11/2025 RC 250327: Land use consent for seasonal workers accommodation for up to 60 persons
No information in relation to HAIL activities could be found on this record.
Note: This application was returned incomplete.
- 22/07/2025 RC 220396V3: Change of conditions to update scheme plan for RC 220396
No information in relation to HAIL activities could be found on this record.
Note: This application is still being assessed and has not been determined.
- 22/07/2025 RC 250155: Subdivision and land use consent for 44 residential allotments
No information in relation to HAIL activities could be found on this record.
Note: This application is still being assessed and has not been determined.
- 16/06/2025 RC 220396V2: Change to conditions 1 and 2 of RC 220396
No information in relation to HAIL activities could be found on this record.
- 13/02/2025 RC 240302: Land use consent for seasonal workers accommodation
No information in relation to HAIL activities could be found on this record.
Note: This application was withdrawn before being determined.
- 27/01/2025 RC 220396V1: Change of Conditions 1, 15 and 21 of RC 220396
Information provided in support of this application indicates that the site has been used for the following activities that may trigger NES-CS requirements
Livestock dip or spray race operations – Item A8
Bulk storage or application of persistent pesticides – Item A10
Bulk storage of petroleum above or below ground – Item A13
Storage tanks or drums for fuel or chemicals – Item A17

	<i>Possible presence of asbestos – Item E1</i> <i>Landfill – Item G3</i> <i>Waste disposal to land – Item G5</i>
10/12/2024	RC 240266: Land use consent for earthworks to construct a reservoir and stormwater attenuation basins <i>Information provided in support of this application indicates that the site has been used for the following activities that may trigger NES-CS requirements</i> <i>Livestock dip or spray race operations – Item A8</i> <i>Bulk storage or application of persistent pesticides – Item A10</i> <i>Bulk storage of petroleum above or below ground – Item A13</i> <i>Storage tanks or drums for fuel or chemicals – Item A17</i> <i>Possible presence of asbestos – Item E1</i> <i>Landfill – Item G3</i> <i>Waste disposal to land – Item G5</i> <i>Note: This application was withdrawn before being determined.</i>
04/10/2023	RC 220396: 151 lot subdivision <i>Information provided in support of this application indicates that the site has been used for the following activities that may trigger NES-CS requirements</i> <i>Livestock dip or spray race operations – Item A8</i> <i>Bulk storage or application of persistent pesticides – Item A10</i> <i>Bulk storage of petroleum above or below ground – Item A13</i> <i>Storage tanks or drums for fuel or chemicals – Item A17</i> <i>Possible presence of asbestos – Item E1</i> <i>Landfill – Item G3</i> <i>Waste disposal to land – Item G5</i> <i>Condition 22(f) of the subdivision component of consent requires a further detailed site investigation be undertaken prior to any residential development on Lots 701-706 of this consent.</i>
04/10/2023	RC 230224: Land use consent for mountain bike trail network and signage in an Outstanding Natural Landscape <i>This application relied on the PSI provided in support of Plan Change 14. The findings of this PSI are described later in this report. No additional information in relation to HAIL activities could be found on this record.</i>
08/10/2021	RC 210310: Three lot subdivision <i>No information in relation to HAIL activities could be found on this record.</i>
10/09/2021	RC 180477: 30 lot subdivision and land use consent for earthworks <i>Information provided in support of this application indicates that the site has been used for horticultural activities and has included waste disposal to land and fuel storage. It also indicated the presence of buildings that may contain asbestos. Bulk application of persistent pesticides is Item A10 on the HAIL, landfill is Item G3, and bulk fuel storage and fuel tanks are Item A17. Buildings containing asbestos and in a poor condition are Item E1. These activities may trigger NES-CS requirements.</i> <i>Note: This application was withdrawn before being determined.</i>
24/07/2020	RC 180487: Land use consent for seasonal workers accommodation <i>Information provided in support of this application indicates that the site has been used for horticultural activities. Bulk application of persistent pesticides is Item A10 on the HAIL and may trigger NES-CS requirements.</i> <i>Note: This application was returned to the applicant before being determined.</i>
19/11/2019	RC 190386: Two lot subdivision and land use consent for seasonal workers accommodation <i>Information provided in support of this application indicates that the site has been used for horticultural activities. Bulk application of persistent pesticides is Item A10 on the HAIL and may trigger NES-CS requirements.</i>

07/10/2003	RC 030230: Two lot subdivision
	<i>No information in relation to HAIL activities could be found on this record.</i>

Building

Consents/Permits/Compliance Schedules:

02/02/2026	BC 260048: New four bedroom dwelling and detached garage
	<i>No information in relation to HAIL activities could be found on this record.</i>
	<i>Note: This application is still being assessed and has not been determined.</i>
21/01/2026	BC 250704: New four bedroom dwelling and detached garage
	<i>No information in relation to HAIL activities could be found on this record.</i>
	<i>Note: This application is still being assessed and has not been determined.</i>
16/12/2019	BC 190952: New effluent pumping system (Connecting to Council reticulated network) and water connection
	<i>No information in relation to HAIL activities could be found on this record.</i>
23/10/2019	BC 190827: New five bay shed
	<i>No information in relation to HAIL activities could be found on this record.</i>
15/10/2020	BC 180910: Erect marquee for temporary workers facility
	<i>Information provided in support of this application indicates that the site has been used for horticultural activities. Bulk application of persistent pesticides is Item A10 on the HAIL and may trigger NES-CS requirements.</i>
	<i>Note: This building consent was refused</i>
04/09/2013	BC 130583: Internal alterations to existing dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
07/07/2010	BC 100420: Install new fire appliance
	<i>No information in relation to HAIL activities could be found on this record.</i>
20/05/2005	BC 050282: Smoko room and ablution block
	<i>No information in relation to HAIL activities could be found on this record.</i>
13/08/2002	BC 020610: New garage
	<i>No information in relation to HAIL activities could be found on this record.</i>
13/08/2002	BC 020611: New garage
	<i>No information in relation to HAIL activities could be found on this record.</i>
16/04/1997	BC 970191: Install new fire appliance
	<i>No information in relation to HAIL activities could be found on this record.</i>
17/02/1995	BC 950042: Additions to packhouse
	<i>No information in relation to HAIL activities could be found on this record.</i>
25/08/1994	BC 941131: Additions to dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
18/05/1994	BC 940928: Farm building
	<i>No information in relation to HAIL activities could be found on this record.</i>
15/06/1990	BP H056051: Extend domestic garage and storeroom
	<i>Information provided in support of this application indicates that the building was relocated to the site and was clad in Hardiplank. Some Hardiplank products produced around and before this date may contain asbestos. Buildings containing asbestos and known to be in poor condition are Item E1 on the HAIL and may trigger NES-CS requirements, if the building is or was in poor condition.</i>
09/02/1989	BP F037779: Install solid fuel heater
	<i>No information in relation to HAIL activities could be found on this record.</i>
31/10/1988	BP F037743: Erect a cool store

	<i>No information in relation to HAIL activities could be found on this record.</i>
01/03/1988	BP E040645: Add to dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
10/11/1986	BP D049811: Install new fire appliance
	<i>No information in relation to HAIL activities could be found on this record.</i>
21/10/1983	BP B69021: Erect a dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
21/10/1983	BP 1611: Plumbing and drainage permit
	<i>No information in relation to HAIL activities could be found on this record.</i>
07/05/1979	BP I69091: Additions to dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
15/10/1975	BP G58593: Erect a hay barn
	<i>No information in relation to HAIL activities could be found on this record.</i>
14/06/1974	BP F92449: Additions to shearing shed
	<i>Information provided in support of this application indicates the presence of a woolshed on the site. Livestock dips or spray races can be associated with woolsheds. These are Item A8 on the HAIL and may trigger NES-CS requirements if present on the site.</i>
09/02/1953	BP 425: Erect new garage and workshop
	<i>No information in relation to HAIL activities could be found on this record.</i>
15/08/1951	BP 313: Erect a new dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>
21/05/1951	BP 307: Erect a new dwelling
	<i>No information in relation to HAIL activities could be found on this record.</i>

Correspondence saved to the property file between December 1985 and February 1986 indicates that one of the dwellings on the site at the time was understood to be in degraded condition. Images understood to likely be of the building are reproduced as Figures 1 and 2. It is not what, if any, remediation works were undertaken. Depending on their age, the buildings on the site at the time may have contained asbestos. Buildings containing asbestos and known to be in poor condition are Item E1 on the HAIL and may trigger NES-CS requirements.



Dwelling - Leyser -
Ripponvale 16/12/85

Figure One: Image understood to be of the sub-standard dwelling inspected in December 1985



*Dwelling - Leyser -
Ripponvale. 16/12/85*

Figure Two: Image understood to be of the sub-standard dwelling inspected in December 1985

Preliminary Site Investigations and Detailed Site Investigations

A PSI was submitted in the context of Plan Change 14. The PSI identified potential sources of contamination including multi-residue pesticides, heavy metals, polycyclic aromatic hydrocarbons, petroleum hydrocarbons and asbestos. It concluded that the likely risk to human health from these contaminants associated with residential uses of the site was moderate to high. It recommended that more detailed assessment be completed at the time the site was proposed to be developed.

A DSI was submitted in the context of RC 220396. This DSI identified potential sources of contamination including heavy metals, organochlorine pesticides, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylene. The investigation included the area identified below.

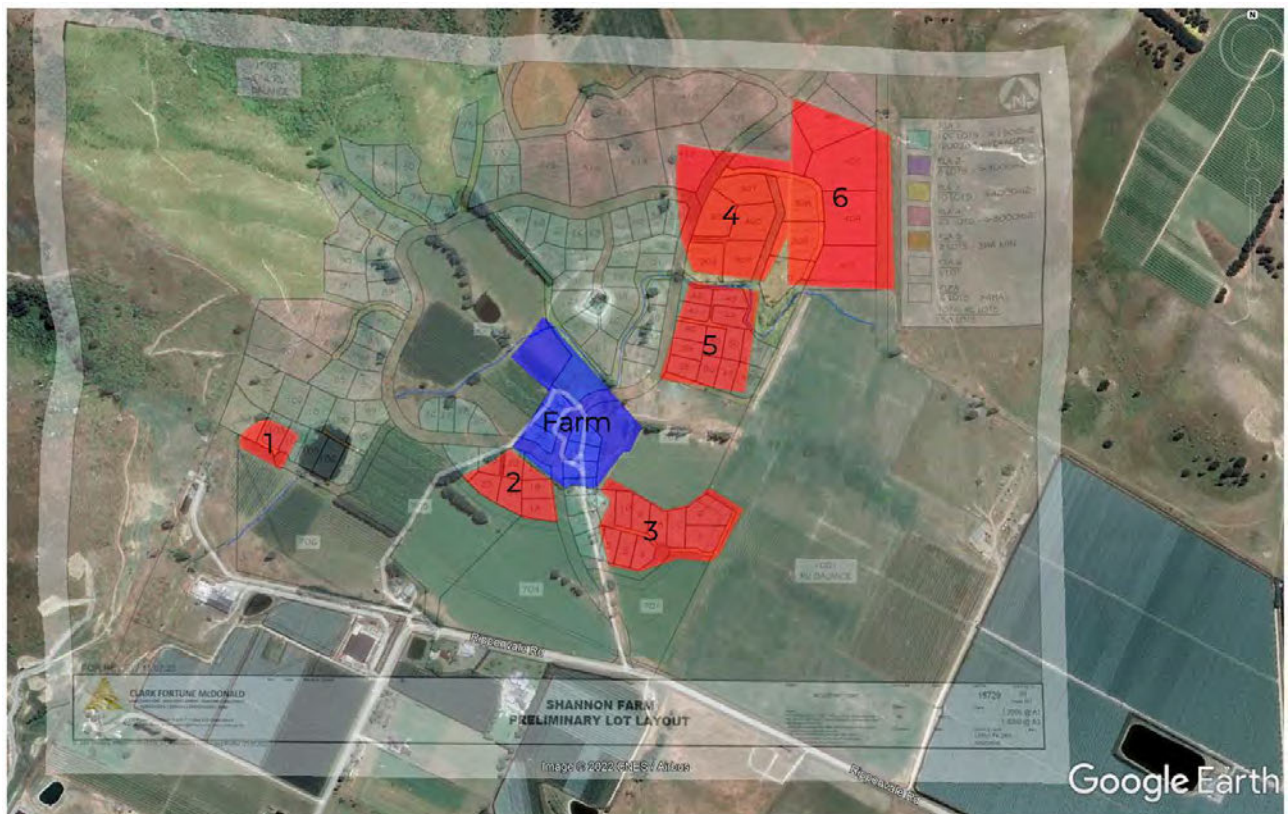


Figure Three: Area investigated by the DSI, with red areas being historic orchards and the blue area being a farmyard.

Soil testing identified no breaches of human health criteria for heavy metals or organochlorine pesticides for rural residential/residential uses in the orchard areas. Arsenic and copper exceeded background levels at most sites. Several samples around the farmyard reported concentrations of lead, zinc, cadmium or arsenic above human health criteria. Organochlorine pesticides, petroleum hydrocarbons, polycyclic aromatic hydrocarbons all exceeded background concentrations. No asbestos was identified. The DSI recommended that site remediation be undertaken as part of the subdivision.

A DSI was submitted in the context of RC 190386. This DSI was specific to part of Lot 2 DP 330709 (Figure Three). Soil testing indicated that concentrations of organochlorine pesticides and heavy metals did not exceed human health criteria around the area investigated.



Figure 1 Site

Figure Four: Site of DSI provided in support of RC 190386.

Aerial Photographs

Council's aerial photographs for the site date back to 2003. Aerial photographs indicate that the site has been used for horticultural activities and livestock yards, and shows evidence of unknown materials storage. Bulk storage or application of persistent pesticides are Item A10 on the HAIL and may trigger NES-CS requirements. Livestock dips or spray races associated with livestock yards are Item A8 on the HAIL. Materials storage could include bulk storage of chemicals (Item A2), storage tanks for fuel or chemicals (Item A17), landfill (Item E3) or waste disposal to land (Item E5).



Figure Five: Aerial photo of the site dated 2025 showing horticultural activities.



Figure Six: Aerial photograph dated 2025 showing unknown materials storage on the site.



Figure Seven: Aerial photograph dated 2019 showing horticultural activities on the site.



Figure Eight: Aerial photo dated 2019 showing livestock yards and unknown materials storage.



Figure Nine: Aerial photograph of the site dated 2006 showing horticultural activities on the site.

Other Land Features

The site was subject to Plan Change 14. Information provided in support of this plan change indicate that the site has been used for the following activities that may trigger NES-CS requirements

- Livestock dip or spray race operations – Item A8
- Bulk storage or application of persistent pesticides – Item A10
- Bulk storage of petroleum above or below ground – Item A13
- Storage tanks or drums for fuel or chemicals – Item A17
- Possible presence of asbestos – Item E1
- Landfill – Item G3
- Waste disposal to land – Item G5

Disclaimer: The Council does not hold records directly relating to activities on the Hazardous Activities and Industries List (HAIL). In the event some information is available it cannot be guaranteed as correct or complete and therefore may not satisfy your request. We therefore recommend you undertake further investigation to determine whether any HAIL activities exist on the site.

Prepared by

Adam Vincent
Planning Officer - Consents
Date: 9 February 2026

Appendix F:
Regional Council Supporting Information

Otago Selected Land Use Sites



11/02/2026, 9:49:11 am

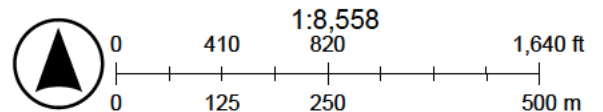
Otago Wells

-  Existing
-  Decommissioned
-  Not Drilled

HAIL Status

-  Verified HAIL
-  Unverified HAIL

New Zealand Imagery



Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

LGOIMA SR.19053 RELEASE

Contaminated Land

No complaints related to contaminated land matters at these properties

The highlighted properties below intersect with sites recorded on the ORC HAIL Register under site number HAIL.01974. Under this site number, there are 12 sub-sites (i.e. HAIL.01974.01 – HAIL.01974.12). Only nine of these sub-sites intersect these highlighted properties.

Legal Description	Title No
Section 11 Block III Cromwell SD	126180
Lot 1 DP 344529	182714
Lot 2 DP 330709	126180
Section 97 Block III Cromwell SD	OT7B/327
Lot 3 DP 420009	476973
Lot 4 DP 420009	476974
Lot 3 DP 344529	182716
Lot 2 DP 344529	182715
Lot 1 DP 420009	476973
Lot 4 DP 344529	182717
Section 4 Block III Cromwell SD	126180
Section 98 Block III Cromwell SD	126180
Lot 2 DP 420009	476974

Section 11 Block III Cromwell SD

- Two HAIL Register sites intersect this property
 - o HAIL.01974.01 (Leyser Orchard – Remainder)
 - o HAIL.01974.07 (Leyser Orchard - Orchard 3) intersect this property.

Lot 2 DP 330709

- Two HAIL Register sites intersect this property
 - o HAIL.01974.01 (Leyser Orchard – Remainder)
 - o HAIL.01974.02 (Leyser Orchard - Workers Accom. 144 Ripponvale)

Section 4 Block III Cromwell SD

- Seven HAIL Register sites intersect this property
 - o HAIL.01974.01 (Leyser Orchard – Remainder)
 - o HAIL.01974.03 (Leyser Orchard - Farmyard A)
 - o HAIL.01974.04 (Leyser Orchard - Orchard 4)
 - o HAIL.01974.05 (Leyser Orchard - Orchard 5)
 - o HAIL.01974.10 (Leyser Orchard - Farmyard B)
 - o HAIL.01974.11 (Leyser Orchard – UST)
 - o HAIL.01974.12 (Leyser Orchard - Roadside Berm)

Information pertaining to these sites can also be viewed on our public mapping register – [Otago Selected Land Use Sites \(SLUS\)](#)

Pollution

- 64 Ripponvale Road – 1 complaint - Breach of consent (2018)
- 16 Ripponvale Road – no complaints
- 116 Kawarau Gorge Road – 1 complaint – Breach of air plan rules – Burning of prohibited material (2024)

Appendix G:

Site Photos

NZCP Un-netted



Figure 1: Typical cherry trees within the NZCP un-netted block.



Figure 2: Storage tanks near the new pump shed on the western boundary of the site



Figure 3: New transformers near the pump shed on the western boundary of the site.



Figure 4: Pump shed near the southern boundary of the site adjacent to the access road.

Accommodation Block



Figure 5: Kill shed



Figure 6: Corrugated iron shed used for storage, cooking and offices



Figure 7: Relocatable houses



Figure 8: Relocatable houses



Figure 9: Relocatable houses



Figure 10: Burn pile with branches and untreated wood from pallets.



Figure 11: Waste cherries



Figure 12: Vehicles and tent sites

NZCP Netted



Figure 13: Frost fan



Figure 14: Frost fan



Figure 15: Frost fan



Figure 16: Frost fan



Figure 17: Minor lubricating oil staining on concrete

NZCP Netted Hub



Figure 18: Mixing area, chemical storage shed and above ground diesel tank



Figure 19: Mineral oil storage near mixing area



Figure 20: Second chemical storage shed.



Figure 21: Interior of first chemical storage shed



Figure 22: Interior of second chemical storage shed



Figure 23: Minor staining beneath the diesel dispenser.



Figure 24: Workshop building



Figure 25: Workshop area



Figure 26: Waste oil storage (under tarp) and empty oil containers



Figure 27: Transformer next to workshop building

Judare Investments Block



Figure 28: Cherry trees within the Judare Investment Block



Figure 29: View over the site from the north east corner



Figure 30: Chemical storage shed



Figure 31: Chemical storage shed



Figure 32: Above ground diesel tank



Figure 33: Interior of shed



Figure 34: Accommodation, offices and storage sheds



Figure 35: Empty chemical containers for recycling



Figure 36: Burn barrel under the trees near the workshop



Figure 37: Minor patch of oil staining.



Figure 38: Interior of workshop

Appendix H:
Sample Lithology Log



SOIL PROFILE LOGS

PROJECT NUMBER:

26011

FIELD STAFF:

SDB

DATE:

23&25 Feb 2026

SITE NAME:

NZCP Cherries

METHOD:

Hand

WEATHER:

Fine

Location	Coordinates		Sample Depth	Sample ID	Soil Lithology
NZCP Unnetted Historic Apricot Area	1298248	5006434	0.0-0.1	SS01	silty SAND
	1298293	5006428	0.0-0.1	SS02+DUP01	silty SAND
	1298210	5006373	0.0-0.1	SS03	silty SAND
	1298259	5006368	0.0-0.1	SS04	silty SAND
	1298215	5006296	0.0-0.1	SS05	silty SAND
	1298267	5006295	0.0-0.1	SS06	silty SAND
NZCP Unnetted	1298176	5006161	0.0-0.1	SS07	silty SAND
	1298370	5006088	0.0-0.1	SS08	silty SAND
	1298227	5006007	0.0-0.1	SS09	silty SAND
	1298391	5005945	0.0-0.1	SS10	silty SAND
	1298084	5005899	0.0-0.1	SS11	silty SAND
	1298303	5005828	0.0-0.1	SS12	sandy SILT
NZCP Netted	1298518	5005790	0.0-0.1	SS13+DUP02	silty SAND (organic topsoil)
	1298694	5005702	0.0-0.1	SS14	silty SAND
	1298780	5005664	0.0-0.1	SS15	silty SAND (organic topsoil)
	1298636	5006063	0.0-0.1	SS16	silty SAND (organic topsoil)
	1298787	5005988	0.0-0.1	SS17	silty SAND (organic topsoil)
	1298909	5005948	0.0-0.1	SS18	silty SAND
NZCP Netted Hub	1298867	5005734	0.0-0.1	SS19	sandy GRAVEL
	1298870	5005721	0.0-0.1	SS20	silty GRAVEL under layer of imported gravel
	1298868	5005713	0.0-0.1	SS21	sandy GRAVEL
	1298878	5005728	0.0-0.1	SS22	sandy GRAVEL
	1298882	5005720	0.0-0.1	SS23	sandy GRAVEL
	1298875	5005710	0.0-0.1	SS24	sandy GRAVEL
Judare	1299026	5005996	0.0-0.1	SS25	silty SAND (organic topsoil)
	1299024	5005893	0.0-0.1	SS26	silty SAND (organic topsoil)
	1299155	5005935	0.0-0.1	SS27	silty SAND
	1299076	5005801	0.0-0.1	SS28	silty SAND with some gravel
	1299115	5005712	0.0-0.1	SS29	silty SAND
	1299124	5005639	0.0-0.1	SS30	silty SAND
Judare Hub	1299053	5005755	0.0-0.1	SS31	silty GRAVEL
	1299057	5005750	0.0-0.1	SS32	gravelly SILT
	1299061	5005744	0.0-0.1	SS33	gravelly SAND
	1299067	5005739	0.0-0.1	SS34	silty SAND with some gravel
	1299078	5005723	0.0-0.1	SS35	gravelly SAND
	1299077	5005735	0.0-0.1	SS36	sandy SILT

Appendix I:

Laboratory Results, Methods and Chain of Custody

CHAIN OF CUSTODY

ANALYTICA
LABORATORIESpart of
ALS Limited

CLIENT INFORMATION				Lab ID (Lab use only)		
Client	e3scientific			Registered By (Lab use only)		Date Registered (Lab use only)
Client Address	Arrow Lane, Arrowtown					
Project Leader	Simon Beardmore					
Project ID	26011	PO Number	26011-SDB			
Site	N7CP					
Sampler	Simon Beardmore					
Phone	s 9(2)(a)					
Email	s 9(2)(a)					
Invoice Email	s 9(2)(a)					
CLIENT REQUESTS (Please Tick)						
Routine		Urgent		ESDAT		QC Report

MATRIX KEY (Customers: Please ensure all samples have the correct matrix assigned)			
S (Solids)	CW (Clean Water)	SL (Saline Water)	WW (Waste Water)
All soils, sediment, sludge	Surface, Ground, Bore, Fresh	Sea Water, Geothermal	Effluent, Trade Waste, Leachate

TESTS REQUESTED									
Sample ID	Depth	Sampling Date	Time	Matrix (Please Circle)	Analysis Requests/Suites [Enter Test Code Below]				Sample Comments (ie: extra test requests, high odour, bulk material)
					HAB	OCF	TPH		
1	SS01	0.0-0.1	23/07/26	8:35	S	✓	✓		
2	SS02			8:40		✓	✓		
3	SS03			8:45		✓	✓		
4	SS04			8:50		✓	✓		
5	SS05			8:55		✓	✓		
6	SS06			9:00		✓	✓		
7	SS25			8:10		✓			
8	SS26			8:15		✓			
9	SS27			8:20		✓			
10	SS28			8:30		✓			
11	SS29			8:05		✓			
12	SS30			8:10		✓			
13	SS31			7:30		✓		✓	
14	SS32			7:35		✓		✓	
15	SS33					✓		✓	
16	SS34			7:45		✓		✓	
17	SS35			7:50		✓		✓	
18	SS36			7:55		✓		✓	
19	DUP01			-		✓	✓		
20									

Environmental Division
Hamilton
Work Order Reference
NH2600810



Telephone : +64 7 974 4740

Sender Name	S. Beardmore	Date Sent	23/07/26	Time sent	8:15 pm	Courier company	NZC	Courier #	SVB0001309
Received by Staff Member	AS	Date Received	24/07/26	Time Received	8:15 pm	Seal Status	✓	Sample Temp	14.3 °C

i chilly bin
Ice packs

Page 1 of 1

CHAIN OF CUSTODY

ANALYTICA
LABORATORIESpart of
ALS Limited

CLIENT INFORMATION				Lab ID (Lab use only)		
Client	e3scientific			Registered By (Lab use only)		Date Registered (Lab use only)
Client Address	Arrow Lane, Arrowtown					
Project Leader	Simon Beardmore					
Project ID	26011	PO Number	26011-508			
Site	NZCP					
Sampler	Simon Beardmore					
Phone	s 9(2)(a)					
Email	s 9(2)(a)					
Invoice Email	s 9(2)(a)					
CLIENT REQUESTS (Please Tick)						
Routine	☒	Urgent	☐	ESDAT	☐	QC Report

MATRIX KEY (Customers: Please ensure all samples have the correct matrix assigned)			
S (Solids)	CW (Clean Water)	SL (Saline Water)	WW (Waste Water)
All soils, sediment, sludge	Surface, Ground, Bore, Fresh	Sea Water, Geothermal	Effluent, Trade Waste, Leachate

TESTS REQUESTED									
Sample ID	Depth	Sampling Date	Time	Matrix (Please Circle)	Analysis Requests/Suites (Enter Test Code Below)				Sample Comments (ie: extra test requests, high odour, bulk material)
					HM8	TPH			
1	SS13	0.1-0.1	25/1/26	6:10	S	✓	✓		
2	SS14			6:15		✓	✓		
3	SS15			6:20		✓	✓		
4	SS16			6:00		✓			
5	SS17			6:05		✓	✓		
6	SS18			6:10		✓			
7	SS19			5:30		✓	✓		
8	SS20			5:35		✓	✓		
9	SS21			5:40		✓	✓		
10	SS22			5:45		✓	✓		
11	SS23			5:50		✓	✓		
12	SS24			5:55		✓	✓		
13	DV102			-		✓	✓		
14	SS07	23/1/26	9:07			✓			
15	SS08		9:10			✓			
16	SS09		9:15			✓			
17	SS10		9:20			✓			
18	SS11		9:25			✓			
19	SS12		9:30			✓			
20									

Environmental Division
Hamilton

Work Order Reference

NH2600891



Telephone : +64 7 974 4740

Sender Name	S. Beardmore	Date Sent	27/1/26	Time sent	10:00 am	Courier company	NZC	Courier #	SVB00001100
Received by Staff Member	EH	Date Received	28/02/26	Time Received	11:00 am	Seal Status	✓	Sample Temp	16.5°C

1 chilly bin Ice pack



CERTIFICATE OF ANALYSIS

Work Order : **NH2600810**

Client : **e3Scientific Limited**

Contact : Simon Beardmore

Address : Arrow Lane Arrowtown
Queenstown Otago New Zealand 9349

Telephone : ---

Project : 26011

Order number : 26011_SDB

C-O-C number : ---

Sampler : Simon Beardmore

Site : NZCP

Quote number : EN/444

No. of samples received : 19

No. of samples analysed : 19

Laboratory : Environmental Hamilton

Contact : Customer Services NH

Address : Ruakura Research Centre, 10 Bisley Rd
Hamilton WKO New Zealand 3214

Telephone : +64 7 974 4740

Date Samples Received : 24-Feb-2026 08:15

Date Analysis Commenced : 24-Feb-2026

Issue Date : 02-Mar-2026 16:18



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below.

Signatories	Position	Accreditation Category
Astra Southerwood	Section Supervisor - Organics	Organics, Hamilton, Waikato
Divya Goundar	Laboratory Technician	Organics, Hamilton, Waikato
Justen Berntsen	Laboratory Technician	Soil Prep, Hamilton, Waikato
Tharanga Samarasinghe	Senior Laboratory Technician	Trace, Hamilton, Waikato



General Comments

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key: CAS Number: CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR: Limit of Reporting (detection limit).

Unit	Description
%	Percent
mg/kg dry weight	mg/kg dry weight

>: greater than.

<: less than.

ø: ALS is not IANZ accredited for these tests.

^: This result is computed from individual analyte detections at or above the level of reporting.

~: Indicates an estimated value.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Samples were collected by yourselves (or your agent) and analysed as received at ALS NZ (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report.



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS01	SS02	SS03	SS04	SS05
				Client Sampling date / time	23-Feb-2026 08:35	23-Feb-2026 08:40	23-Feb-2026 08:45	23-Feb-2026 08:50	23-Feb-2026 08:55
Compound	CAS Number	LOR	Unit		NH2600810-001	NH2600810-002	NH2600810-003	NH2600810-004	NH2600810-005
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		12.0	9.83	7.85	8.56	8.06
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.128	0.098	0.170	0.141	0.161
Chromium	7440-47-3	0.125	mg/kg dry weight		12.1	11.7	8.63	10.5	9.04
Copper	7440-50-8	0.075	mg/kg dry weight		104	76.5	171	113	189
Lead	7439-92-1	0.25	mg/kg dry weight		20.8	15.8	15.7	16.2	16.9
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		12.8	11.6	8.88	9.77	9.32
Zinc	7440-66-6	0.05	mg/kg dry weight		80.5	65.9	63.0	58.5	73.3
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
2,4'-DDD	53-19-0	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
2,4'-DDE	3424-82-6	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
2,4'-DDT	789-02-6	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDT	50-29-3	0.010	mg/kg dry weight		0.072	<0.010	<0.010	<0.010	<0.010
4,4'-DDE	72-55-9	0.010	mg/kg dry weight		0.023	<0.010	<0.010	<0.010	<0.010
4,4'-DDD	72-54-8	0.010	mg/kg dry weight		0.011	<0.010	<0.010	<0.010	<0.010
alpha-BHC	319-84-6	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
beta-BHC	319-85-7	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Aldrin	309-00-2	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Chlordane-cis	5103-74-2	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Chlordane-trans	5103-71-9	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Chlordane (sum)	12789-03-6	0.020	mg/kg dry weight		<0.020	<0.020	<0.020	<0.020	<0.020
Nonachlor-cis	5103-73-1	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
delta-BHC	319-86-8	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Total DDT	----	0.020	mg/kg dry weight		0.106	<0.020	<0.020	<0.020	<0.020
Dieldrin	60-57-1	0.050	mg/kg dry weight		<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan 1	959-98-8	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan 2	33213-65-9	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan sulfate	1031-07-8	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Endrin	72-20-8	0.050	mg/kg dry weight		<0.050	<0.050	<0.050	<0.050	<0.050



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS01	SS02	SS03	SS04	SS05
				Client Sampling date / time	23-Feb-2026 08:35	23-Feb-2026 08:40	23-Feb-2026 08:45	23-Feb-2026 08:50	23-Feb-2026 08:55
Compound	CAS Number	LOR	Unit		NH2600810-001	NH2600810-002	NH2600810-003	NH2600810-004	NH2600810-005
					Result	Result	Result	Result	Result
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
Endrin ketone	53494-70-5	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Endrin aldehyde	7421-93-4	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
gamma-BHC (Lindane)	58-89-9	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor	76-44-8	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor epoxide	1024-57-3	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene (HCB)	118-74-1	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	72-43-5	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
Nonachlor-trans	39765-80-5	0.010	mg/kg dry weight		<0.010	<0.010	<0.010	<0.010	<0.010
OCP_S: Organochlorines Pesticides - Soil by GCMSMS (Surrogates)									
Tetrachlorometaxylene	877-09-8	0.1	%		96.8	94.2	88.6	91.6	89.3



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS06 ----	SS25 ----	SS26 ----	SS27 ----	SS28 ----
				Client Sampling date / time	23-Feb-2026 09:00	23-Feb-2026 08:10	23-Feb-2026 08:15	23-Feb-2026 08:20	23-Feb-2026 08:00
Compound	CAS Number	LOR	Unit		NH2600810-006	NH2600810-007	NH2600810-008	NH2600810-009	NH2600810-010
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		7.43	5.99	7.88	5.41	8.49
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.157	0.082	0.069	0.149	0.087
Chromium	7440-47-3	0.125	mg/kg dry weight		10.4	8.21	8.20	8.82	9.17
Copper	7440-50-8	0.075	mg/kg dry weight		136	529	85.7	814	156
Lead	7439-92-1	0.25	mg/kg dry weight		14.9	11.6	13.5	11.2	16.6
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	<0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		8.82	8.95	9.55	10.7	10.3
Zinc	7440-66-6	0.05	mg/kg dry weight		56.8	155	63.7	257	95.0
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
2,4'-DDD	53-19-0	0.010	mg/kg dry weight		<0.010	----	----	----	----
2,4'-DDE	3424-82-6	0.010	mg/kg dry weight		<0.010	----	----	----	----
2,4'-DDT	789-02-6	0.010	mg/kg dry weight		<0.010	----	----	----	----
4,4'-DDT	50-29-3	0.010	mg/kg dry weight		<0.010	----	----	----	----
4,4'-DDE	72-55-9	0.010	mg/kg dry weight		<0.010	----	----	----	----
4,4'-DDD	72-54-8	0.010	mg/kg dry weight		<0.010	----	----	----	----
alpha-BHC	319-84-6	0.010	mg/kg dry weight		<0.010	----	----	----	----
beta-BHC	319-85-7	0.010	mg/kg dry weight		<0.010	----	----	----	----
Aldrin	309-00-2	0.010	mg/kg dry weight		<0.010	----	----	----	----
Chlordane-cis	5103-74-2	0.010	mg/kg dry weight		<0.010	----	----	----	----
Chlordane-trans	5103-71-9	0.010	mg/kg dry weight		<0.010	----	----	----	----
Chlordane (sum)	12789-03-6	0.020	mg/kg dry weight		<0.020	----	----	----	----
Nonachlor-cis	5103-73-1	0.010	mg/kg dry weight		<0.010	----	----	----	----
delta-BHC	319-86-8	0.010	mg/kg dry weight		<0.010	----	----	----	----
Total DDT	----	0.020	mg/kg dry weight		<0.020	----	----	----	----
Dieldrin	60-57-1	0.050	mg/kg dry weight		<0.050	----	----	----	----
Endosulfan 1	959-98-8	0.010	mg/kg dry weight		<0.010	----	----	----	----
Endosulfan 2	33213-65-9	0.010	mg/kg dry weight		<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.010	mg/kg dry weight		<0.010	----	----	----	----
Endrin	72-20-8	0.050	mg/kg dry weight		<0.050	----	----	----	----



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS06 ----	SS25 ----	SS26 ----	SS27 ----	SS28 ----
				Client Sampling date / time	23-Feb-2026 09:00	23-Feb-2026 08:10	23-Feb-2026 08:15	23-Feb-2026 08:20	23-Feb-2026 08:00
Compound	CAS Number	LOR	Unit		NH2600810-006	NH2600810-007	NH2600810-008	NH2600810-009	NH2600810-010
					Result	Result	Result	Result	Result
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
Endrin ketone	53494-70-5	0.010	mg/kg dry weight		<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.010	mg/kg dry weight		<0.010	----	----	----	----
gamma-BHC (Lindane)	58-89-9	0.010	mg/kg dry weight		<0.010	----	----	----	----
Heptachlor	76-44-8	0.010	mg/kg dry weight		<0.010	----	----	----	----
Heptachlor epoxide	1024-57-3	0.010	mg/kg dry weight		<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.010	mg/kg dry weight		<0.010	----	----	----	----
Methoxychlor	72-43-5	0.010	mg/kg dry weight		<0.010	----	----	----	----
Nonachlor-trans	39765-80-5	0.010	mg/kg dry weight		<0.010	----	----	----	----
OCP_S: Organochlorines Pesticides - Soil by GCMSMS (Surrogates)									
Tetrachlorometaxylene	877-09-8	0.1	%		103	----	----	----	----



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS29 ----	SS30 ----	SS31 ----	SS32 ----	SS33 ----
				Client Sampling date / time	23-Feb-2026 08:05	23-Feb-2026 08:10	23-Feb-2026 07:30	23-Feb-2026 07:35	23-Feb-2026 00:00
Compound	CAS Number	LOR	Unit		NH2600810-011	NH2600810-012	NH2600810-013	NH2600810-014	NH2600810-015
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		6.57	5.70	5.14	10.4	4.95
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.105	0.075	0.100	0.072	0.068
Chromium	7440-47-3	0.125	mg/kg dry weight		7.99	6.97	8.72	10.3	6.85
Copper	7440-50-8	0.075	mg/kg dry weight		1520	1510	512	220	99.7
Lead	7439-92-1	0.25	mg/kg dry weight		12.6	9.83	13.4	15.3	15.2
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	<0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		9.42	7.49	8.29	11.6	7.13
Zinc	7440-66-6	0.05	mg/kg dry weight		330	338	202	87.3	81.5
MC_S: Moisture Content									
Moisture Content	----	0.1	%		----	----	6.3	6.9	2.9
svTPH_S: Semi-Volatile Total Petroleum Hydrocarbons - Soil by Gas Chromatography									
C7 - C9 Fraction	----	10.0	mg/kg dry weight		----	----	<10.0	<10.0	<10.0
C10 - C14 Fraction	----	15.0	mg/kg dry weight		----	----	<15.0	<15.0	<15.0
TPH C15-C36	----	25.0	mg/kg dry weight		----	----	399	184	337
TPH C7-C36	----	50.0	mg/kg dry weight		----	----	399	184	337



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS34	SS35	SS36	DUP01	
				Client Sampling date / time	23-Feb-2026 07:45	23-Feb-2026 07:50	23-Feb-2026 07:55	23-Feb-2026 00:00	----
Compound	CAS Number	LOR	Unit		NH2600810-016	NH2600810-017	NH2600810-018	NH2600810-019	----
					Result	Result	Result	Result	----
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		18.5	6.05	7.72	9.99	----
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.078	0.043	0.089	0.119	----
Chromium	7440-47-3	0.125	mg/kg dry weight		12.0	8.43	8.65	12.5	----
Copper	7440-50-8	0.075	mg/kg dry weight		177	85.1	418	81.9	----
Lead	7439-92-1	0.25	mg/kg dry weight		19.9	17.5	15.7	16.5	----
Mercury	7439-97-6	0.025	mg/kg dry weight		0.026	<0.025	0.032	<0.025	----
Nickel	7440-02-0	0.05	mg/kg dry weight		13.1	9.09	10.8	12.3	----
Zinc	7440-66-6	0.05	mg/kg dry weight		116	58.2	151	70.2	----
MC_S: Moisture Content									
Moisture Content	----	0.1	%		6.8	2.0	31.7	----	----
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
2,4'-DDD	53-19-0	0.010	mg/kg dry weight		----	----	----	<0.010	----
2,4'-DDE	3424-82-6	0.010	mg/kg dry weight		----	----	----	<0.010	----
2,4'-DDT	789-02-6	0.010	mg/kg dry weight		----	----	----	<0.010	----
4,4'-DDT	50-29-3	0.010	mg/kg dry weight		----	----	----	<0.010	----
4,4'-DDE	72-55-9	0.010	mg/kg dry weight		----	----	----	<0.010	----
4,4'-DDD	72-54-8	0.010	mg/kg dry weight		----	----	----	<0.010	----
alpha-BHC	319-84-6	0.010	mg/kg dry weight		----	----	----	<0.010	----
beta-BHC	319-85-7	0.010	mg/kg dry weight		----	----	----	<0.010	----
Aldrin	309-00-2	0.010	mg/kg dry weight		----	----	----	<0.010	----
Chlordane-cis	5103-74-2	0.010	mg/kg dry weight		----	----	----	<0.010	----
Chlordane-trans	5103-71-9	0.010	mg/kg dry weight		----	----	----	<0.010	----
Chlordane (sum)	12789-03-6	0.020	mg/kg dry weight		----	----	----	<0.020	----
Nonachlor-cis	5103-73-1	0.010	mg/kg dry weight		----	----	----	<0.010	----
delta-BHC	319-86-8	0.010	mg/kg dry weight		----	----	----	<0.010	----
Total DDT	----	0.020	mg/kg dry weight		----	----	----	<0.020	----
Dieldrin	60-57-1	0.050	mg/kg dry weight		----	----	----	<0.050	----
Endosulfan 1	959-98-8	0.010	mg/kg dry weight		----	----	----	<0.010	----
Endosulfan 2	33213-65-9	0.010	mg/kg dry weight		----	----	----	<0.010	----



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS34	SS35	SS36	DUP01	
				Client Sampling date / time	23-Feb-2026 07:45	23-Feb-2026 07:50	23-Feb-2026 07:55	23-Feb-2026 00:00	----
Compound	CAS Number	LOR	Unit	NH2600810-016	NH2600810-017	NH2600810-018	NH2600810-019		----
				Result	Result	Result	Result		----
OCP_S: Organochlorines Pesticides - Soil by GCMSMS									
Endosulfan sulfate	1031-07-8	0.010	mg/kg dry weight	----	----	----	<0.010		----
Endrin	72-20-8	0.050	mg/kg dry weight	----	----	----	<0.050		----
Endrin ketone	53494-70-5	0.010	mg/kg dry weight	----	----	----	<0.010		----
Endrin aldehyde	7421-93-4	0.010	mg/kg dry weight	----	----	----	<0.010		----
gamma-BHC (Lindane)	58-89-9	0.010	mg/kg dry weight	----	----	----	<0.010		----
Heptachlor	76-44-8	0.010	mg/kg dry weight	----	----	----	<0.010		----
Heptachlor epoxide	1024-57-3	0.010	mg/kg dry weight	----	----	----	<0.010		----
Hexachlorobenzene (HCB)	118-74-1	0.010	mg/kg dry weight	----	----	----	<0.010		----
Methoxychlor	72-43-5	0.010	mg/kg dry weight	----	----	----	<0.010		----
Nonachlor-trans	39765-80-5	0.010	mg/kg dry weight	----	----	----	<0.010		----
svTPH_S: Semi-Volatile Total Petroleum Hydrocarbons - Soil by Gas Chromatography									
C7 - C9 Fraction	----	10.0	mg/kg dry weight	<10.0	<10.0	<10.0	----		----
C10 - C14 Fraction	----	15.0	mg/kg dry weight	<15.0	<15.0	<15.0	----		----
TPH C15-C36	----	25.0	mg/kg dry weight	83.5	52.6	622	----		----
TPH C7-C36	----	50.0	mg/kg dry weight	83.5	52.6	622	----		----
OCP_S: Organochlorines Pesticides - Soil by GCMSMS (Surrogates)									
Tetrachlorometaxylene	877-09-8	0.1	%	----	----	----	86.5		----

Sub-Matrix : SOIL

[illegible]



Brief Method Summaries

Analytical Methods	Method	Matrix	Method Descriptions
Heavy Metals in Soil	HM_S	SOIL	Samples dried and passed through a 2 mm sieve followed by acid digestion and analysis by ICP-MS. In accordance with in-house procedure based on US EPA method 200.8.
Moisture Content in Soil	MC_S	SOIL	Moisture content is determined gravimetrically by drying at 103 °C.
Organochlorines in Soil	OCP_DS_S	SOIL	Analysis by GCMSMS (Chlordane (sum) is calculated from the main actives in technical Chlordane: Chlordane, Nonachlor and Heptachlor). In accordance with in-house procedure. Total DDT - Sum of DDT, DDD and DDE (4,4' and 2,4' isomers)
Semi-Volatile Total Petroleum Hydrocarbons in Soil	svTPH_S	SOIL	Analysis by GC-FID (C7-C36). (In accordance with in-house procedure based on US EPA 8015).



CERTIFICATE OF ANALYSIS

Work Order : **NH2600891**

Client : **e3Scientific Limited**

Contact : Simon Beardmore

Address : Arrow Lane Arrowtown
Queenstown Otago New Zealand 9349

Telephone : ---

Project : 26011

Order number : 26011_SDB

C-O-C number : ---

Sampler : Simon Beardmore

Site : NZCP

Quote number : EN/444

No. of samples received : 19

No. of samples analysed : 19

Laboratory : Environmental Hamilton

Contact : Customer Services NH

Address : Ruakura Research Centre, 10 Bisley Rd
Hamilton WKO New Zealand 3214

Telephone : +64 7 974 4740

Date Samples Received : 28-Feb-2026 11:00

Date Analysis Commenced : 02-Mar-2026

Issue Date : 04-Mar-2026 15:35



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below.

Signatories	Position	Accreditation Category
Astra Southerwood	Section Supervisor - Organics	Organics, Hamilton, Waikato
Justen Berntsen	Laboratory Technician	Soil Prep, Hamilton, Waikato
Tharanga Samarasinghe	Senior Laboratory Technician	Trace, Hamilton, Waikato



General Comments

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key: CAS Number: CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR: Limit of Reporting (detection limit).

Unit	Description
%	Percent
mg/kg dry weight	mg/kg dry weight

>: greater than.

<: less than.

ø: ALS is not IANZ accredited for these tests.

^: This result is computed from individual analyte detections at or above the level of reporting.

~: Indicates an estimated value.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Samples were collected by yourselves (or your agent) and analysed as received at ALS NZ (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report.



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS13 Depth: 0.0-0.1	SS14 Depth: 0.0-0.1	SS15 Depth: 0.0-0.1	SS16 Depth: 0.0-0.1	SS17 Depth: 0.0-0.1
				Client Sampling date / time	25-Feb-2026 06:10	25-Feb-2026 06:15	25-Feb-2026 06:20	25-Feb-2026 06:00	25-Feb-2026 06:05
Compound	CAS Number	LOR	Unit		NH2600891-001	NH2600891-002	NH2600891-003	NH2600891-004	NH2600891-005
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		9.03	6.33	6.61	6.77	7.72
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.237	0.192	0.171	0.210	0.180
Chromium	7440-47-3	0.125	mg/kg dry weight		13.7	11.9	9.49	9.90	13.1
Copper	7440-50-8	0.075	mg/kg dry weight		1320	145	348	1030	378
Lead	7439-92-1	0.25	mg/kg dry weight		15.7	12.1	12.6	12.2	12.7
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	<0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		11.4	8.70	11.9	9.21	9.12
Zinc	7440-66-6	0.05	mg/kg dry weight		413	85.0	115	330	109
MC_S: Moisture Content									
Moisture Content	----	0.1	%		11.7	7.1	17.9	----	3.4
svTPH_S: Semi-Volatile Total Petroleum Hydrocarbons - Soil by Gas Chromatography									
C7 - C9 Fraction	----	10.0	mg/kg dry weight		<10.0	<10.0	<10.0	----	<10.0
C10 - C14 Fraction	----	15.0	mg/kg dry weight		<15.0	<15.0	<15.0	----	<15.0
TPH C15-C36	----	25.0	mg/kg dry weight		1080	87.2	177	----	106
TPH C7-C36	----	50.0	mg/kg dry weight		1080	87.2	177	----	106



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS18 Depth: 0.0-0.1	SS19 Depth: 0.0-0.1	SS20 Depth: 0.0-0.1	SS21 Depth: 0.0-0.1	SS22 Depth: 0.0-0.1
				Client Sampling date / time	25-Feb-2026 06:10	25-Feb-2026 05:30	25-Feb-2026 05:35	25-Feb-2026 05:40	25-Feb-2026 05:45
Compound	CAS Number	LOR	Unit		NH2600891-006	NH2600891-007	NH2600891-008	NH2600891-009	NH2600891-010
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		7.52	4.31	7.43	4.84	6.45
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.251	0.051	0.090	0.045	0.127
Chromium	7440-47-3	0.125	mg/kg dry weight		10.5	9.36	18.9	12.3	18.6
Copper	7440-50-8	0.075	mg/kg dry weight		608	91.0	1570	239	343
Lead	7439-92-1	0.25	mg/kg dry weight		14.2	21.0	24.6	16.4	21.2
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	<0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		10.5	8.24	12.6	8.17	11.6
Zinc	7440-66-6	0.05	mg/kg dry weight		206	184	535	112	415
MC_S: Moisture Content									
Moisture Content	----	0.1	%		----	1.5	16.7	1.9	10.9
svTPH_S: Semi-Volatile Total Petroleum Hydrocarbons - Soil by Gas Chromatography									
C7 - C9 Fraction	----	10.0	mg/kg dry weight		----	<10.0	<10.0	<10.0	<10.0
C10 - C14 Fraction	----	15.0	mg/kg dry weight		----	<15.0	<15.0	<15.0	<15.0
TPH C15-C36	----	25.0	mg/kg dry weight		----	250	219	199	1200
TPH C7-C36	----	50.0	mg/kg dry weight		----	250	219	199	1200



Analytical Results

Sub-Matrix: SOIL

(Matrix: SOIL)

				Client Sample ID	SS23 Depth: 0.0-0.1	SS24 Depth: 0.0-0.1	DUP02 ----	SS07 ----	SS08 ----
				Client Sampling date / time	25-Feb-2026 05:50	25-Feb-2026 05:55	25-Feb-2026 00:00	23-Feb-2026 09:07	23-Feb-2026 09:10
Compound	CAS Number	LOR	Unit		NH2600891-011	NH2600891-012	NH2600891-013	NH2600891-014	NH2600891-015
					Result	Result	Result	Result	Result
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		7.77	4.43	8.33	10.8	6.47
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.099	0.081	0.218	0.230	0.168
Chromium	7440-47-3	0.125	mg/kg dry weight		12.9	9.84	14.6	15.7	8.82
Copper	7440-50-8	0.075	mg/kg dry weight		413	296	1310	59.6	28.8
Lead	7439-92-1	0.25	mg/kg dry weight		408	12.1	17.5	15.5	11.4
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	0.031	<0.025	<0.025
Nickel	7440-02-0	0.05	mg/kg dry weight		11.8	7.16	10.5	18.4	8.58
Zinc	7440-66-6	0.05	mg/kg dry weight		246	473	424	99.9	56.6
MC_S: Moisture Content									
Moisture Content	----	0.1	%		4.4	5.5	10.9	----	----
svTPH_S: Semi-Volatile Total Petroleum Hydrocarbons - Soil by Gas Chromatography									
C7 - C9 Fraction	----	10.0	mg/kg dry weight		<10.0	<10.0	<10.0	----	----
C10 - C14 Fraction	----	15.0	mg/kg dry weight		<15.0	<15.0	<15.0	----	----
TPH C15-C36	----	25.0	mg/kg dry weight		465	417	987	----	----
TPH C7-C36	----	50.0	mg/kg dry weight		465	417	987	----	----



Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

				Client Sample ID	SS09	SS10	SS11	SS12	
				Client Sampling date / time	----	----	----	----	----
				23-Feb-2026 09:15	23-Feb-2026 09:20	23-Feb-2026 09:25	23-Feb-2026 09:30		----
Compound	CAS Number	LOR	Unit		NH2600891-016	NH2600891-017	NH2600891-018	NH2600891-019	----
					Result	Result	Result	Result	----
HM_S: Elements in Soil									
Arsenic	7440-38-2	0.125	mg/kg dry weight		13.3	10.9	12.4	12.9	----
Cadmium	7440-43-9	0.005	mg/kg dry weight		0.192	0.166	0.196	0.244	----
Chromium	7440-47-3	0.125	mg/kg dry weight		16.9	15.3	16.4	18.6	----
Copper	7440-50-8	0.075	mg/kg dry weight		39.6	56.6	43.6	30.9	----
Lead	7439-92-1	0.25	mg/kg dry weight		16.4	15.2	16.8	18.4	----
Mercury	7439-97-6	0.025	mg/kg dry weight		<0.025	<0.025	<0.025	<0.025	----
Nickel	7440-02-0	0.05	mg/kg dry weight		20.8	17.6	17.6	21.8	----
Zinc	7440-66-6	0.05	mg/kg dry weight		99.5	94.1	84.7	90.2	----

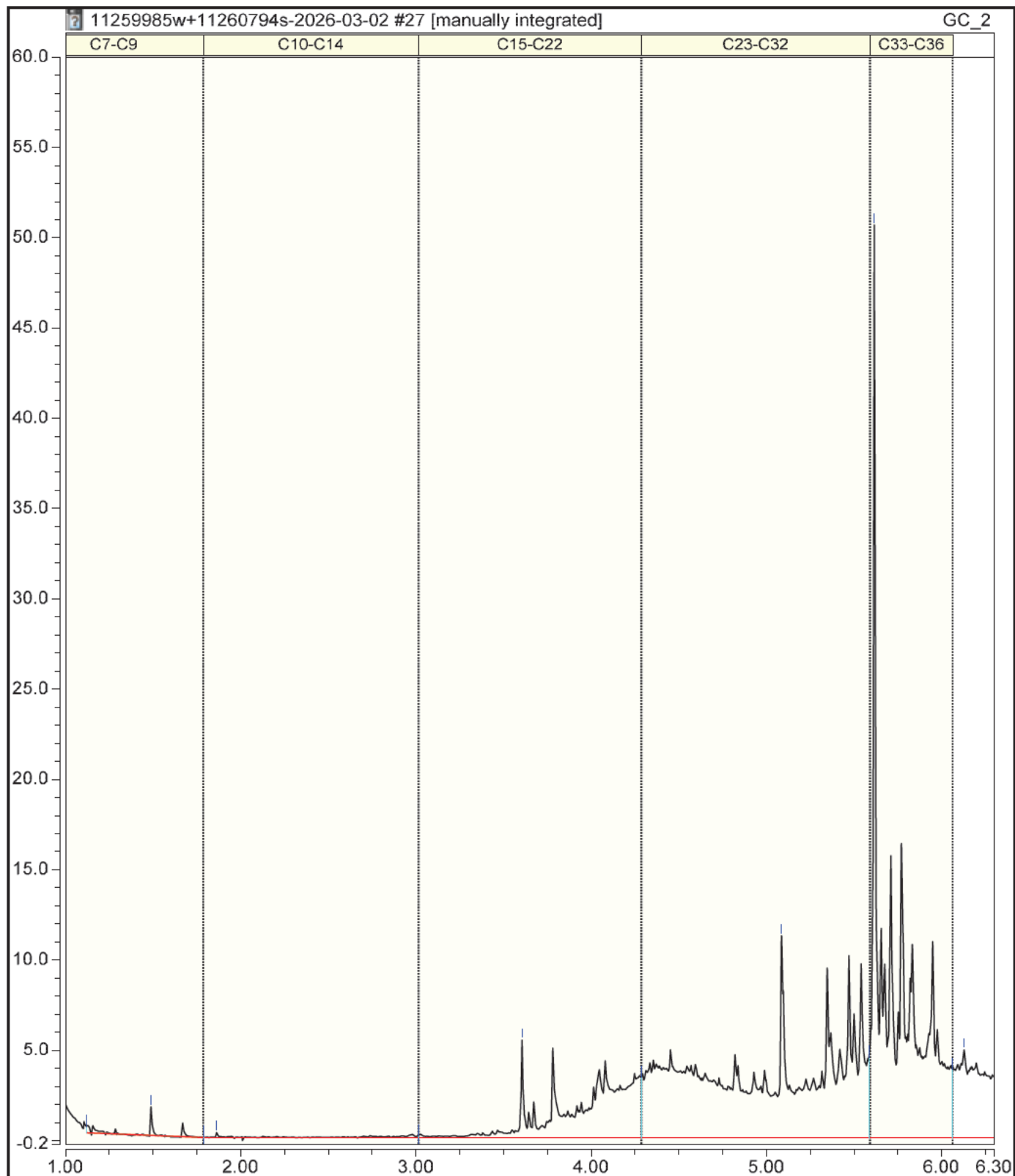


Brief Method Summaries

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Heavy Metals in Soil	HM_S	SOIL	Samples dried and passed through a 2 mm sieve followed by acid digestion and analysis by ICP-MS. In accordance with in-house procedure based on US EPA method 200.8.
Moisture Content in Soil	MC_S	SOIL	Moisture content is determined gravimetrically by drying at 103 °C.
Semi-Volatile Total Petroleum Hydrocarbons in Soil	svTPH_S	SOIL	Analysis by GC-FID (C7-C36). (In accordance with in-house procedure based on US EPA 8015).

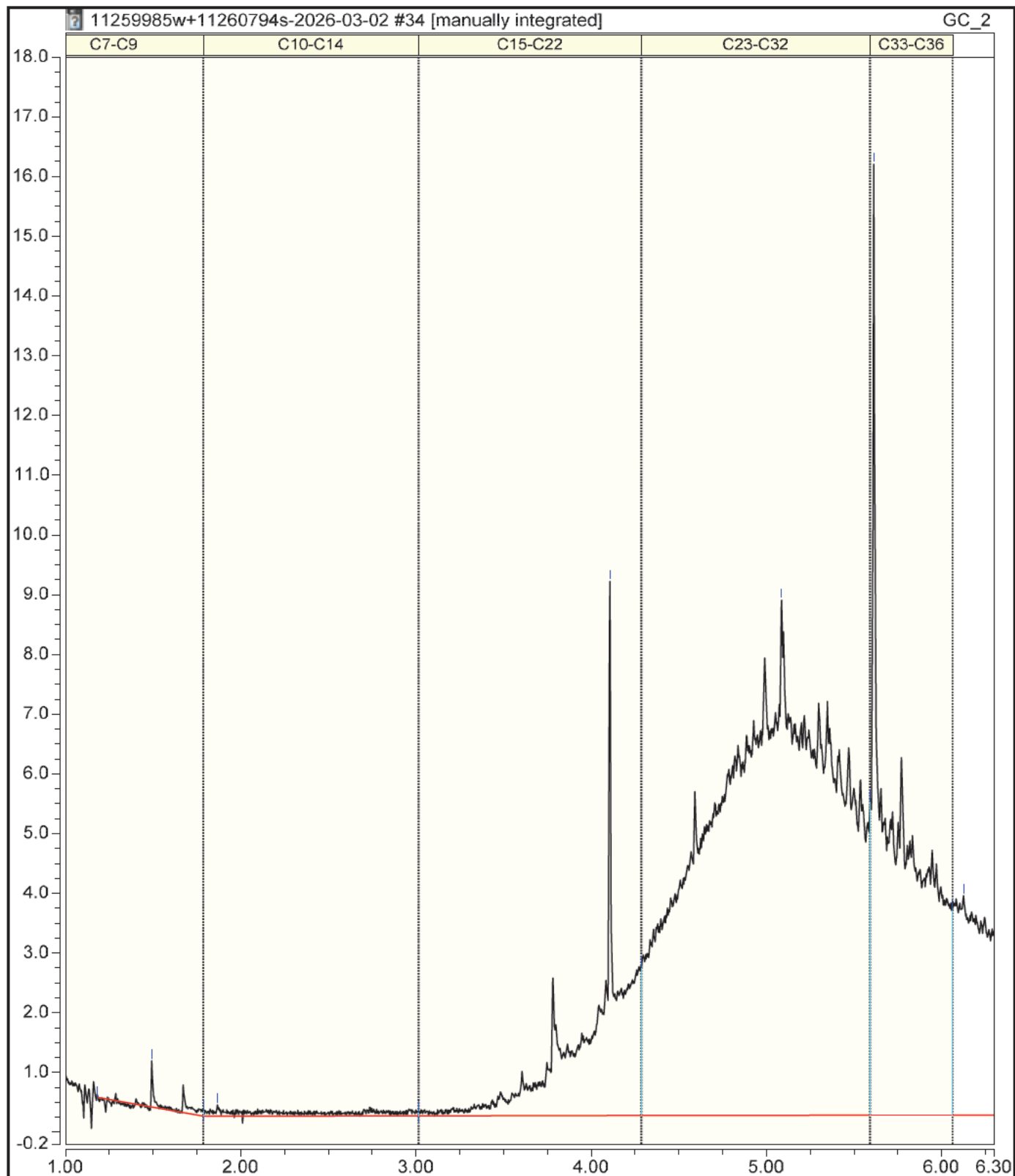
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NH2600891-001



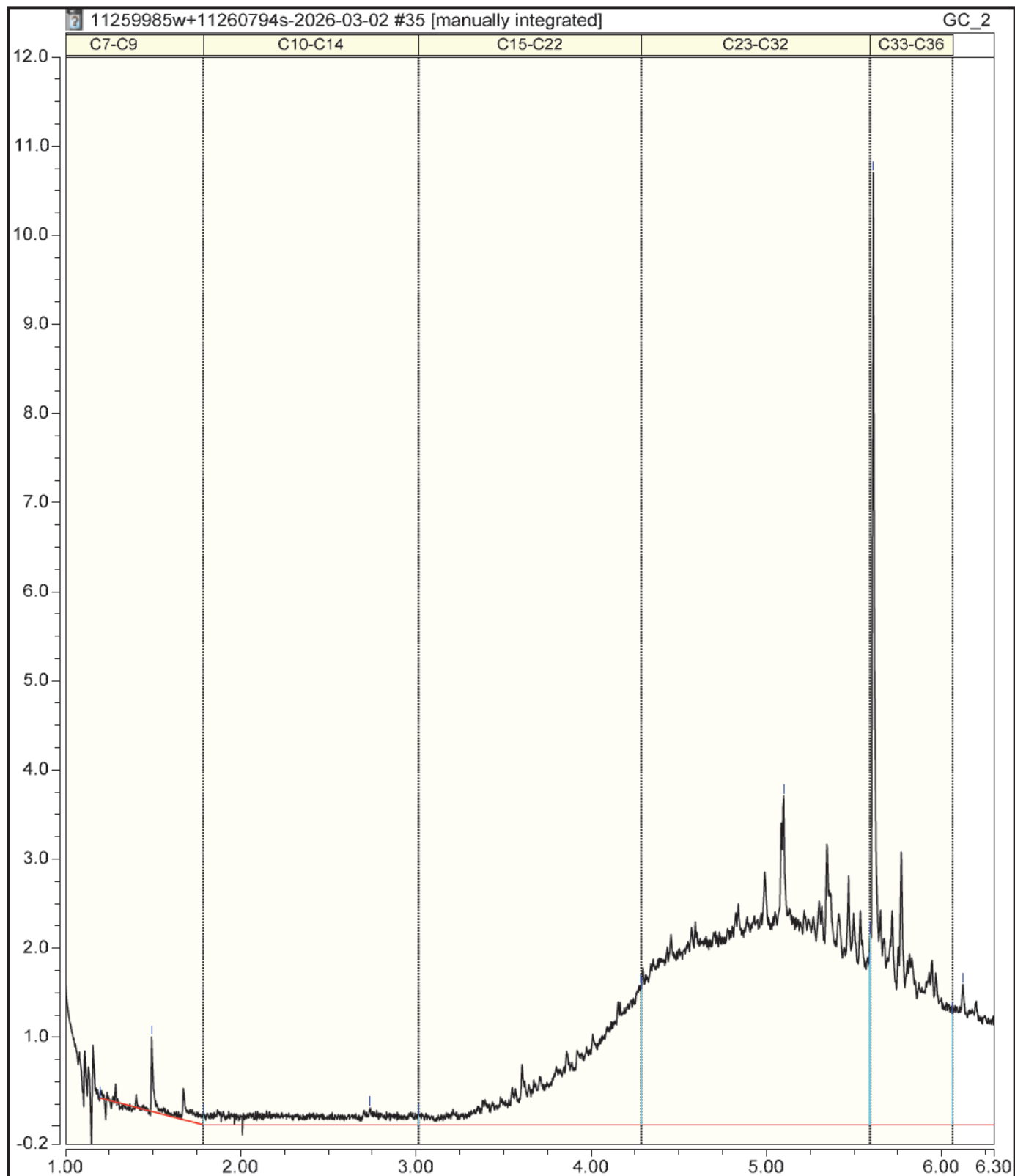
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NH2600891-010



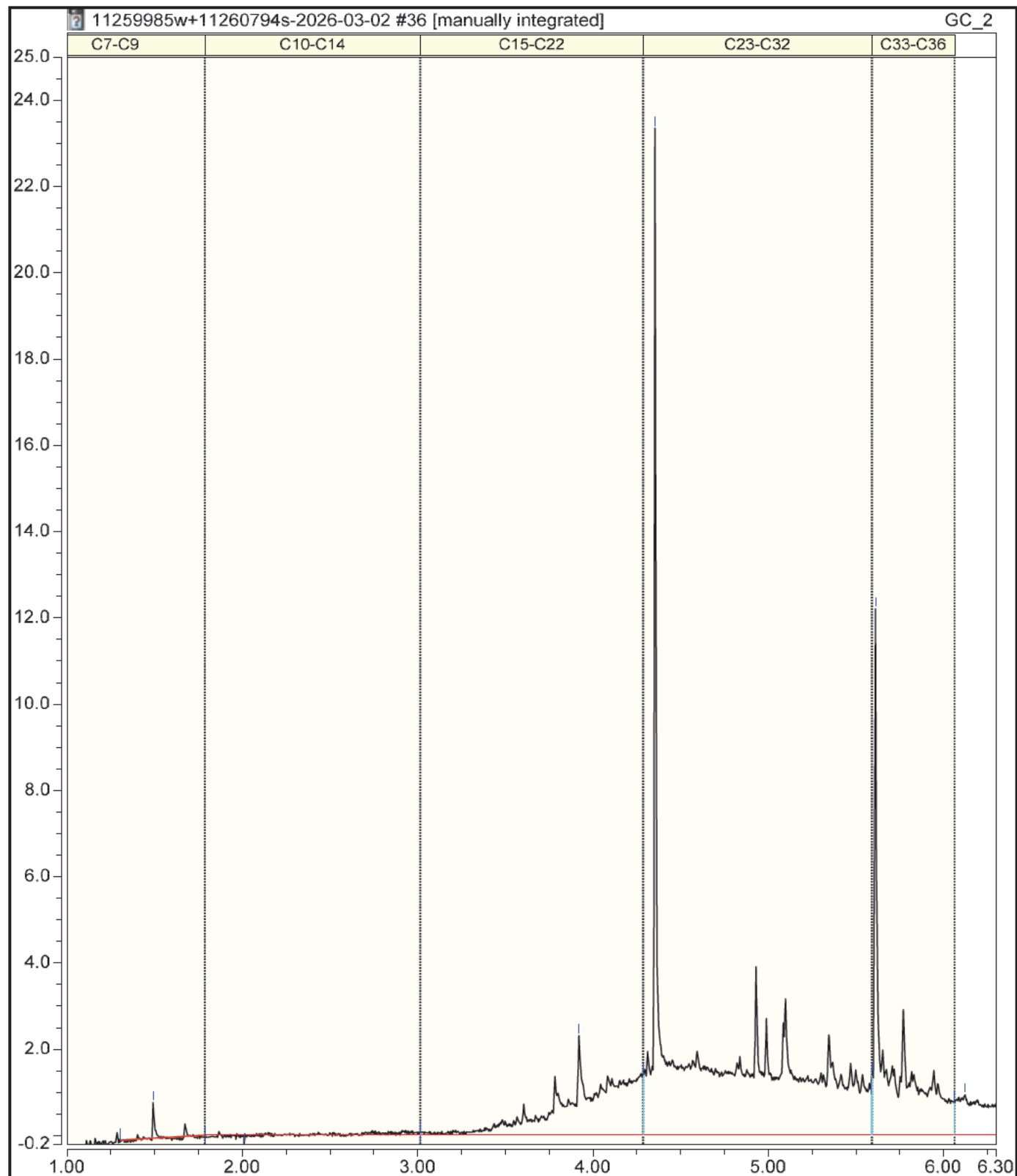
Chromatogram

NH2600891-011



Chromatogram

NH2600891-012



Chromatogram

NH2600891-013

