

PRELIMINARY SITE INVESTIGATION

37211 / 2 AUCKLAND STREET, ASHLEY / ALISTAIR CAMERON

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Davis Ogilvie & Partners Ltd

QUALITY ASSURANCE

Title: Preliminary Site Investigation: 2 Auckland Street, Ashley

Client: Alistair Cameron

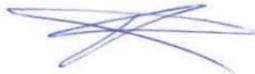
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DISCLAIMER

This Preliminary Site Investigation has been prepared at the specific instruction Alistair Cameron. It addresses potential land contamination conditions underlying the property at 2 Auckland Street, Ashley, Canterbury (Lot 1 DP 394101).

Davis Ogilvie did not perform a complete assessment of all possible conditions or circumstances that may exist at the site. Conditions may exist which were undetectable given the limited investigation of the site and have not been taken into account in the report.

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1.0 INTRODUCTION

Alistair Cameron engaged Davis Ogilvie to complete an environmental assessment at 2 Auckland Street, Ashley, Canterbury (Lot 1 DP 394101). We understand Alistair Cameron is proposing a residential subdivision of 2 Auckland Street, Ashley and requires environmental assessment to support his subdivision consent application.

This assessment comprises a Preliminary Site Investigation (PSI) completed for the entire site with some initial targeted soil sampling and assessment within areas of concern.

1.1 Objectives of the Assessment

The objective of this PSI was to evaluate the following:

- Whether there has been (or is more likely than not to have been) a potentially contaminating land use at the site and specifically within the proposed land to be subdivided for new residential lots.
- The nature and source of probable contaminants.
- The possible locations of contamination.
- Known or potential exposure pathways by which identified receptors could be exposed to the contaminants, under current or known proposed future land use.
- Known or potential human and ecological receptors that could be exposed to contaminants.
- Potential regulatory and financial consequences related to the identified land contamination for the project.

1.2 Approach

The preliminary site investigation was completed in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG) and specifically CLMG No.1 and No.5 (2021). The PSI includes four main stages, record review, site reconnaissance, interviews with site occupants and this report summarising the information collected and assessment of potential land contamination. The following scope of work was completed:

- Review of available site records including records from Environment Canterbury (ECan) and Waimakariri District Council (WDC), namely, the Listed Land Use Report (LLUR) property statement, historical aerial photographs, property file and Land Information Memorandum (LIM).
- Attend the site to conduct a site walk over, complete an evaluation of the land, and built assets in order to evaluate the potential for releases of hazardous substances to land.
- Interviews with site owners to understand site and evaluate past uses and land conditions.
- Targeted soil sampling was also completed in the vicinity of the former residential property at the site.

- Preparation of a PSI report, including a summary of the site setting, site history, the nature and source of probable contaminants, known or potential exposure pathways and known or potential receptors. The report will be produced in accordance with the requirements of the NES CS Regulations and as per the Ministry for the Environment (MfE) Contaminated Land Management Guidelines No.1.

2.0 STATUTORY CONSIDERATIONS

2.1 Managing Contaminants in Soil to Protect Human Health (NES CS)

The NES CS for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations under the Resource Management Act (1991) came into effect on 1 January 2012. The NES CS regulates activities undertaken on contaminated land and provides nationally consistent human health risk-based standards for management of such activities. The NES CS does not include criteria for environmental risk assessment instead this relies upon the Resource Management Act (1991) and rules within Regional Plans.

The NES CS applies to 'pieces of land' on which any activity in the HAIL is 'more likely than not' to have occurred and where soil disturbance activities exceed the permitted thresholds. According to the NES regulations (8.3), disturbing the soil of the piece of land is a permitted activity while 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.*

The NES CS process assesses the likelihood of contaminated soil existing at the site by way of a preliminary site investigation. If a HAIL activity is identified as having 'more likely than not' occurred, then the NES CS will be considered to apply to the site should a change in land use, subdivision and disturbing or removing the soil be required.

If these thresholds, among others, are exceeded then a land use resource consent would be required. A resource consent application should include a Detailed Site Investigation (DSI) undertaken to establish the level of land contamination and status of the consent required (controlled versus restricted discretionary). Should the DSI indicate that soil concentrations are at or below background values for that site then the NES would be considered to no longer apply and resource consent would not be required.

2.2 ECan Regional Plan

Regional Councils are required to manage the effects of contaminated land discharges to land, water and air. ECan has several rules relating to the assessment, management and use of sites containing contaminants in the land within their Land and Water Regional Plan (LWRP). Additional resource consents may be required should a DSI identify that contaminants are being discharged to the environment outside of thresholds set within the LWRP.

3.0 SITE DESCRIPTION AND SETTING

The approximately 8 ha site with legal identifiers Lot 1 DP 394101 is located in the North Canterbury town of Ashley in the Waimakariri District, approximately 6.6 km west of State Highway 1 (Main North Road), and 3.0 km northeast of Rangiora town centre. The land parcel is zoned 'Rural' and is bounded by Canterbury Street to the north, Auckland Street to the west, Lower Sefton Road to the south, and developed rural-residential land to the east. The latest available GRIP aerial photo of the site and vicinity is provided in Figure 1.

The site is relatively flat with minimal elevation change observable across the site. The site is largely undeveloped grassed farmland. A residential dwelling and temporary storage yard and stockpile area are observed in the northern end of the site.

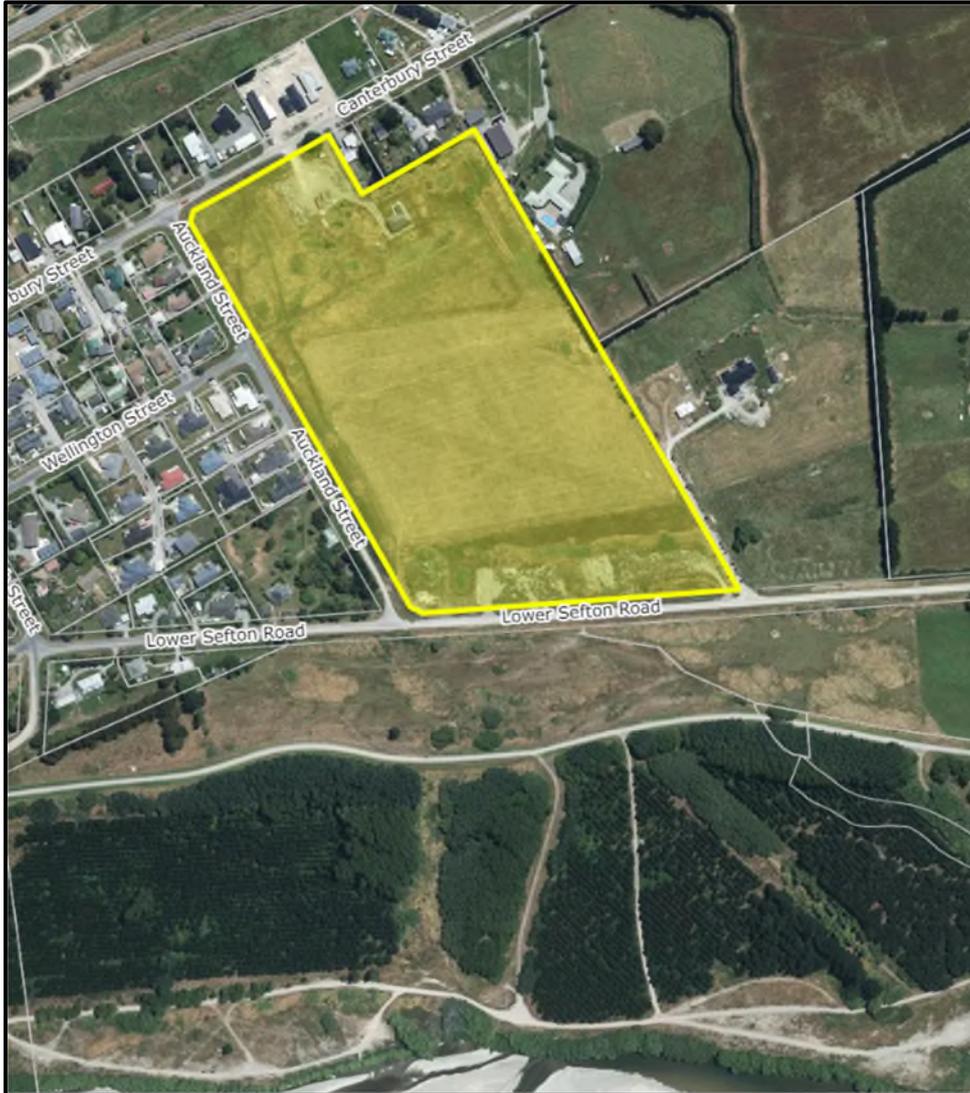


Figure 1: Site Location.

3.1 Existing Land-use and Structures

Vehicular access to the site is gained from the north of the site via Canterbury Street. The site access road is unsealed and opens up to an unsealed storage area containing farming and building materials and some small stockpiles of aggregate.

There is a single permanent structure on the site which consists of a relocated residential dwelling positioned in the north of the site. The residence appeared to be unoccupied at the time of the site visit.

The majority of the land appears to be used for grazing with two paddocks present. In the south of the site, a large stockpile of river gravels is present. Gravel screening equipment and small stockpiles of finer gravel are also present on land adjacent to the Lower Sefton Road site boundary.

Site information is summarised in Table 1 while the layout of the site is depicted in Figure 2.

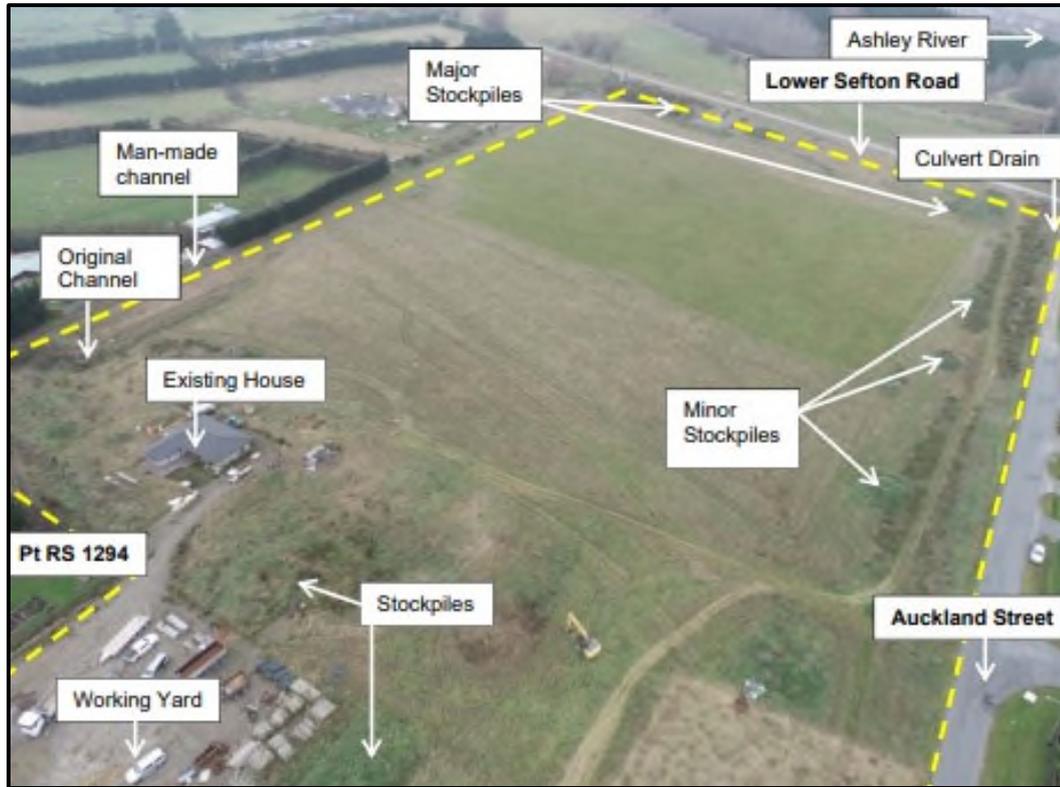
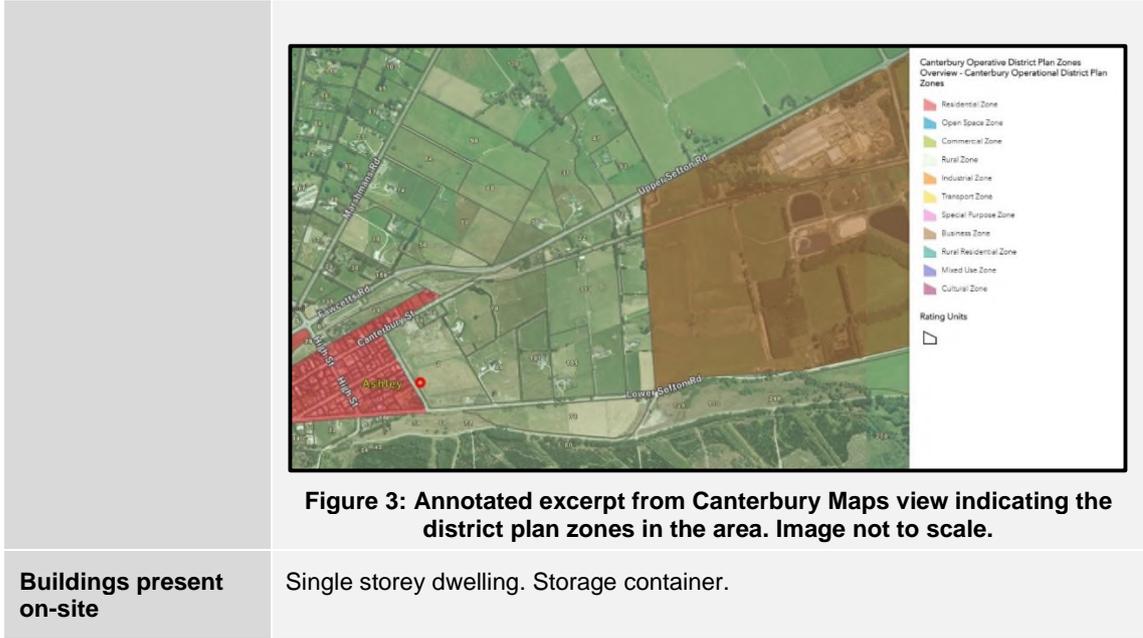


Figure 2: Site layout and built features.

Table 1: Site Details	
Item	Description
Address	2 Auckland Street, Ashley, Canterbury
Legal Description	Lot 1 DP 394101
Property Owners	Alistair John Dougal Cameron
Site Area	8 ha for Lot 1 DP 394101
Territorial Authority	Waimakariri District Council
Current Land Use	Rural land use. Figure 3 below indicates district planning zones within and near the site.



The site setting is summarised in Table 2.

Table 2: Site Setting	
Item	Description
Topography	The site is generally flat to undulating with stockpiles in the southern end of the site, resulting in an irregular surface. Elevations obtained from google earth indicate the site is situated between 27 and 32 m above sea level with a general downward gradient towards the southeast and Ashley River.
Local Setting	The property is located on Auckland Street in Ashley, bounded by Canterbury Street to the north, Auckland Street to the west, Lower Sefton Road to the south, and developed rural-residential land to the east. The site is generally otherwise surrounded by residential and other lifestyle block sized properties.
Nearest Surface Water & Use	The Ashley River is the nearest surface water receptor located approximately 320 m south of the site and is separated from the site by a raised flood bank and Lower Sefton Road. A narrow waterway, Saltwater Creek, flows through adjacent farmland, 135 m east of the site. In the north-eastern corner of the site, the original drainage channel has been diverted into a man-made drainage channel running along the north boundary and northern half of the eastern boundary.

3.2 Geology and Hydrogeology

The documented geology and hydrogeology of the site and surrounding area is summarised in Table 3.

Table 3: Geology and Hydrogeology

Item	Description
<p>Geology</p>	<p>The published geology of the site is identified as “Grey to grey-brown river alluvium of undifferentiated Late Quaternary age (IQa)” covering most of the site. A mapped geological boundary is located approximately 90 m north of the southern boundary of the site, striking northeast / southwest where the geology changes to modern river (Holocene) floodplain deposits of “Grey river alluvium beneath plains or low-level terraces (Q1a).” A further geological boundary is mapped 40 m south of the site where the geology changes to active floodplain deposits of “Grey river alluvium, comprising gravel, sand and silt, in active floodplains (Q1a_af)”, as shown in Figure 4.</p> <div data-bbox="667 611 1193 1137" data-label="Image"> </div> <p>Figure 4: Geology of the Area. 2 Auckland Street outlined with yellow dashed line.</p> <p>A geotechnical investigation was completed by Davis Ogilvie in July 2020 and included the excavation of 22 test pits across the site. The shallow soil profile generally consisted of a surficial topsoil layer overlying a unit of silt, which ranged from 1.1 to 3.7 m thick, then dense silty and sandy gravel.</p>
<p>Hydrogeology</p>	<p>Canterbury maps indicates that there are no pre-existing bores / wells on the property. The closest existing groundwater wells publicly available via Environment Canterbury (ECan) are 160 – 410 m west of the site (M35/0001, M35/7335 and M35/7558). The wells all show a calculated (minimum 80%) depth to groundwater of approximately 3.7 m below ground level.</p> <p>During the Davis Ogilvie geotechnical investigation (2020), groundwater was encountered at a depth of between 2.4 – 5.4 m below existing ground level (EGL).</p>
<p>Groundwater Abstractions</p>	<p>There are no registered active groundwater take consents on site and none within 500 m of the site.</p>
<p>Discharge Consents</p>	<p>There are no registered active discharge consents found for the property, but there are 22 within 250 m of the site on Canterbury Maps.</p> <p>The majority (19) of the 22 discharge activities are related to residential waste water discharges via septic tank to ground. None of the 22 discharge activities are considered to have the potential to contaminate the site and were not considered further in the conceptual site model. Given the number of nearby septic tank discharges shallow groundwater is considered to be unlikely suitable for use as potable supply.</p>

3.3 Ground Water and Surface Water Sensitivity

Groundwater is anticipated to be located at a relatively shallow depth beneath the site at a depth of approximately 3 metres. A groundwater bore search indicated that there are several shallow registered active and consented groundwater takes within 500 m of the site.

An assessment to establish whether the shallow groundwater aquifer below the site is a ‘sensitive aquifer’ as defined by the Ministry for Environment (MfE) Guidelines (2011) has been undertaken (refer to Table 4 below). It is noted that an aquifer is sensitive when either all the first three criteria set out below are met or the fourth criterion is met in accordance with Module 5.2.3 of the MfE Guidelines.

Table 4: Groundwater and Surface Water Sensitivity	
Criteria	Assessment
The aquifer is not artesian or confined; and	Yes. The site is underlain by an unconfined or semi unconfined aquifer.
The aquifer is expected to be less than 10 m below the potential suspected source of impact; and	Yes. Groundwater is expected to be at a depth of approximately 3 m bgl based on well information near the site.
The aquifer is of quality appropriate for use, can yield water at a useful rate and is in an area where abstraction and use of groundwater may be reasonably foreseen; or	No. The upper groundwater bearing strata is considered unlikely to be of suitable quality.
The source is less than 100 m from a sensitive surface water body (i.e., a surface water body where limited dilution is available to mitigate the impact of contaminated groundwater discharging into the surface water body).	No. No surface water receptors were identified within 100 m of the site.
Sensitivity Assessment	Based on the above, groundwater is not considered to be sensitive.

Groundwater is considered to be not sensitive in accordance with the MfE sensitive aquifer assessment. Section 15 of the Resource Management Act prohibits the discharge of contaminants to groundwater unless specifically allowed for in a regional plan rule.

3.4 Proposed Development

Alistair Cameron proposes to subdivide his rural zoned property at 2 Auckland Street in Ashley to create several residential lots. There are several potential scheme designs, however the approximate sizes and positions of proposed lots for one design are shown in Figure 5 together with the Davis Ogilvie (2020) geotechnical investigation locations.



Figure 5: Proposed Concept Subdivision of 2 Auckland Street, Ashley. Davis Ogilvie 37211_G01.

4.0 SITE HISTORY

The history of the site was established via the review of several sources of information. Source included discussions the current occupier, a review of the WDC property file, records of title, review of available historical aerial photographs from Canterbury Maps, Google Earth and Retrolens, a review of consents and groundwater information presented on Canterbury Maps online GIS database. Each source and the relevant information gained is discussed below.

4.1 ECan Listed Land Use Register

Canterbury Regional Council (CRC) maintains a Listed Land Use Register (LLUR) of past and current land uses within the Canterbury region. The LLUR documents sites that have or have had a hazardous activity or land use conducted according to the MfE Hazardous Activities and Industries List (HAIL). Sites that are recorded as currently or previously having had an activity on the HAIL trigger the requirement for a contaminated land investigation prior to development. The LLUR has been populated by ECan primarily from a review of historical aerial photographs and is considered by ECan to not be complete.

The CRC LLUR property statement (see Figure 6 and **Appendix D**) was requested by Davis Ogilvie on 22 November 2023 for the site and does not appear to list any HAIL activities present on the site.



Figure 6: Excerpt from the LLUR property summary report.

There are no known documented areas at the site on the LLUR which would be classified as meeting the definition of HAIL. A single un-investigated HAIL site (HAIL: A10, SIT172157) is located within 50 m of the site and is considered to be at such a distance from the site to be not relevant to this site assessment and site conceptual site model.

4.2 Previous Environmental Reports

Following a review of the LLUR, no previous environmental investigations are known to have been completed at the site or submitted to ECan.

A geotechnical investigation was completed by Davis Ogilvie in July 2020 and included the excavation of 22 test pits across the site. The shallow soil profile generally consisted of a surficial topsoil layer overlying a unit of silt, which ranged from 1.1 to 3.7 m thick, then dense silty and sandy gravel. Groundwater was encountered at between 2.4 – 5.4 m below existing ground level (EGL). No visual or olfactory evidence of land contamination was noted during the intrusive geotechnical investigation.

4.3 Records of Title

Historic Records of Title were obtained from LINZ for the site and are presented in **Appendix B** and again do not indicate a potential owner associated with hazardous activities or industrial land uses.

4.4 Historical Aerial Photograph Review

Aerial photographs obtained from the CRC online Geographical Information System (GIS), Retrolens and Canterbury Maps dating from 1960 to 2023 have been reviewed. The relevant visible features are summarised in Table 5 while the photographs available are presented in **Appendix E**.

Table 5: Historical Aerial Photographs

Date	Description
1940-44	Dwelling with mature trees around section and two other structures present on northern end of site of unknown use. Grazing farmland present elsewhere. Drain in northeast of site visible.
1960-64	New line of vegetation near building other than that no other significant changes observable.
1963	Image shows sheep in paddocks across site and site access from Auckland Street to what appears to be the farm yard area with two distinct structures (possible shearing shed). The driveway continues to the residential property.
1965-69	Image of low quality, no visible changes.
1970-74	No significant changes except sheep are not visible instead paddocks appeared to have been ploughed or grass harvested as machinery lines visible.
1975-79	No visible changes.
1990-94	Two of the three previous structures appear to have been removed as have the trees and shelter break around the residential property. Note the historical aerial photograph and lot boundaries do not align well.
1995-99	No visible changes.
2005-09	Main residential building removed, but two smaller out-buildings still present. Additional informal vehicle tracks from Auckland St boundary across site.
2010-14	Two smaller out-buildings have been removed and several stockpiles are visible in their location. A drain appears to have been constructed in northeast of the site. The gravel stockpile in the south of the site is forming commencing in the south-eastern corner.
2015-19	New residential building in current location and storage yard / stockpile area now present. The drain around the north east of the site has been constructed and the gravel stockpile size has increased. Some other small stockpiles are visible in south west and west of the site.
Present	No visible changes.

4.4.1 WDC Property File

The WDC electronic property file was provided to Davis Ogilvie and reviewed by an Environmental Scientist (see **Appendix C**). Selected observations from the WDC file relevant to this assessment were limited with documentation relating to a vehicle crossing from Auckland Street and the relocation of the existing dwelling in 2017 present. Following a review of the property file no additional hazardous activities or industrial land uses were apparent.

5.0 SITE VISIT

A Davis Ogilvie Environmental Scientist attended the site on 30 November 2023 to complete a site visit, to review site layout, observe potential signs of land contamination and gather information from the site with regards to its history and site operations. During the site visit, the current owner, Mr Cameron, was available to discuss the history of the site with Davis Ogilvie staff.

5.1 Site Interviews

During the onsite discussion with Mr Cameron, it was revealed that he has owned the property for approximately 20 years. He indicated the following:

- An old cottage present in the north of the site burnt down prior to him purchasing the land and the debris from the fire was cleared from the site at the time.
- The yard area in the north of the site has been used for occasional truck parking and storage of miscellaneous items. The drums observed were all bought empty and cleaned and were not used on site.
- No sheep dips or similar activities had been carried out on the site to his knowledge.
- He had brought in the gravel stockpiles from the Ashley River and has previously screened the gravel into different size fractions for re-use in construction projects.

5.2 Site Observations

Observations made by the Davis Ogilvie Environmental Scientist on 1 September 2023 at the site are summarised below. A selection of photographs taken during the site visit are presented in **Appendix A**.

- Dark coloured soil and ash was present over an approx. 100 m² area in the vicinity of the former farmhouse. Soil samples of the ash were collected during the site visit and are discussed in Section 5.3.
- The site vegetation was relatively long, and the ground surface was not visible over most of the site.
- The yard area contained stockpiles of gravel and treated timber, several empty oil drums. There were no signs of significant land contamination or materials that would result in land contamination.

- Adjacent to the yard area a small stack of wood waste was present and two stockpiles of soil which were vegetated and unable to be visually assessed.

5.3 Intrusive Investigation

Although no confirmed HAILs were identified for the land, based on the demolition of the fire damaged former residence and the age of the structure (pre-1940s) the potential for soil contamination from heavy metals, and particularly lead, was required to be assessed.

An initial soil sampling programme was designed, and samples collected from the potential areas of concern during the site visit. The soil sampling programme was designed to evaluate the source area with some additional samples outside of this immediate area to evaluate potential distribution.

5.3.1 Methodology

The following investigation assessment methodology was undertaken:

- Soil samples were collected based on visual and olfactory evidence of contamination, soil type, depth and location.
- Each sample was evaluated for visual and olfactory indicators of contamination by an experienced environmental scientist.
- Soil samples were typically collected from the ground surface to a depth of approximately 0.1 m.
- All samples were placed in plastic jars or 200-micron zip lock bags supplied by the Laboratory. Containers were then sealed, labelled with a unique identifier, and placed in chilled containers prior to transportation to the laboratory. Samples were transported to Hill Labs under the standard chain of custody documentation provided in **Appendix F**.
- To reduce the potential for cross contamination, each sample was collected using disposable nitrile gloves that were discarded following the collection of each sample.
- Once sealed within the container, the samples were screened for heavy metals using a hand-held XRF analyser.
- The sampling was completed in accordance with Davis Ogilvie standard operating procedures while geological logging was completed in general accordance with the New Zealand Geotechnical Society Inc. 'Guideline for the Field Classification of Soil and Rock for Engineering Purposes' December 2005.
- All field work and sampling was undertaken in general accordance with the procedures for the appropriate handling of potentially contaminated soils as described in the MfE Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils (2021).

- Following receipt of the samples by Hill Labs, the soil samples were scheduled for a selection of analytes including heavy metals.
- Assessment of soil concentrations for contaminants of concern with applicable standards and soil acceptance criteria for the protection of human health and the environment.

The investigation locations are displayed in Figure 7.



Figure 7: Investigation and soil sampling locations. Not to scale.

5.3.2 Sample Analysis

Following receipt and registration of the soil samples at Hill Labs, the following analysis was scheduled:

- Five of the collected soil samples were selected for analysis for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc).

5.3.3 Quality Assurance and Quality Control

The laboratory data has been considered sufficient to be relied upon for this assessment based on the following QA / QC procedures:

- Each sample was collected, labelled, and handled following Davis Ogilvie soil sampling and handling procedures.

- All fieldwork has been managed by a Suitably Qualified and Experienced Practitioner (SQEP) and this report was reviewed by a SQEP, as required by the National Environmental Standard for Soil Contamination (NESCS).
- All soil samples were submitted to Hill Labs Limited. Hill Labs is a recognised laboratory that are accredited by International Accreditation New Zealand (IANZ) which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). The tests were performed in accordance with the terms of their accreditation and no errors with the data were reported by either laboratory.

6.0 ASSESSMENT CRITERIA

The soil concentrations have been compared to the assessment criteria described in this section. This initial assessment was completed based on the scope and our clients proposed project goals.

6.1 Priority Contaminants: Soil Contaminant Standards

The NES for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations under the Resource Management Act (1991) came into effect on 1 January 2012.

The NES introduced 12 soil contaminant standards (SCSs) for priority contaminants for the protection of human health in a variety of land use scenarios. The NES requires that the Contaminated Land Management Guideline No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values be used where an NES SCS is not available.

The User's Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health¹ details Soil Contaminant Standards (SCSs) for seven inorganic substances and five organic compounds (or groups of compounds). The contaminants analysed at this site for which SCSs are available are arsenic, copper, lead, and zinc.

Given the potential future residential land use (10% produce) has been adopted. SCSs adopted for the site are presented in the assessment table.

6.2 Other Applicable Human Health Standards

For contaminants of concern that are not listed as priority contaminants, the NESCS references the Ministry for the Environment's Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values to provide guidance.

¹ Ministry for the Environment (MfE) (2012). Users' Guide. National Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health. Ministry for the Environment, Wellington, New Zealand.

For the one heavy metal detected at the site for which SCSs are not available, zinc, the Australian National Environment Protection (Assessment of Site Contamination) Measure (NEPM) (NEPC, 2013) concentrations have been adopted for screening assessment purposes for a high-density land use scenario.

6.3 Background Concentrations

The NES Regulations under 5(9) do not apply to a piece of land where a detailed site investigation exists that demonstrates that any contaminants in or on the piece of land are at, or below, background concentrations.

Where contaminants are identified above background, an NES resource consent may be required where the volume of soil to be disturbed or disposed of within the area of the site containing elevated concentrations exceeds the permitted volumes.

The site is mapped on Canterbury Maps as being situated within the regional, recent soil group and the regional, yellow grey earth (YGE) group. Cleanfill sites also often use background concentrations relative to their location, to determine waste acceptance criteria.

7.0 RESULTS

7.1 Potential Soil Contamination Observations

The observations during the investigation are summarised below:

- The soil encountered in the test locations S01 – S03 consisted of a black and brown silty topsoil with fragments of wood and some metal. The layer appeared to be approximately 100 – 200 mm thick.
- Grass and vegetation growth in the majority of locations also appeared to be healthy but limited in some areas due to the presence of tin sheets or other materials.
- No potential asbestos containing materials (PACM) were observed within any of the five sampling locations.

7.2 XRF Screening

Each soil sample was screened twice with the XRF. Lead concentrations were elevated in S01 – S03, while arsenic concentrations in S01 & S02 were also elevated with respect to background concentrations and residential soil contaminant standards (SCS).

7.3 Analytical Results

Soil analytical results have been compared against assessment criteria for the proposed land use. The laboratory reports are included in **Appendix F** while the assessment comparison tables with selected guidelines and standards is presented in **Appendix G**. The analytical results can be summarised as follows:

- Lead concentrations in S01, S02 and S03 are elevated and exceed the residential (10% produce) SCS.
- Arsenic in S01 is also elevated and exceeds the residential SCS.
- Concentrations of heavy metals arsenic, cadmium, copper, lead, mercury, and zinc in at least one or more soil samples analysed were also elevated and above reported background concentrations (YGE soil) for the site.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This assessment has identified overall the land has not been used for hazardous activities or industrial land uses and no 'HAIL' are considered as are more likely than not to have occurred at the site.

An area of minor soil contamination has been identified in an area in the north of the site and is likely to be related to lead based paint on the former farm residence. Lead based paint contamination associated with residential buildings is not described in the MfE HAIL Guidance (2023) and therefore the soil contamination associated with this activity are not considered to be a HAIL and trigger the NES Regulations. The suspected area of soil contamination is likely to be localised and present in and around former farm structures in the north of the site and the likelihood for this to have caused widespread significant soil contamination at the site is considered to be low.

Soil sampling and laboratory analysis of those samples from within the identified farm building footprint area has indicated soil containing concentrations of heavy metals above background values and residential standards. This soil will require remediation prior to bulk earthworks and the change of land use to residential. Overall remediation of this area of the site is relatively straightforward given the small scale and accessibility. Remedial earthworks could be completed as a permitted activity given the small scale and therefore are not considered to require a separate NES resource consent (for soil disturbance and disposal).

In accordance with Regulation 8(4), the proposed subdivision activity and change of land use is considered to be a permitted activity as it is considered highly unlikely that soil contamination at the site presents an unacceptable risk to human health for future residential receptors.

APPENDIX A

Site Photolog



Photograph 1: View from site entrance and yard area toward relocated residential house.



Photograph 2: Gravel stockpiles in yard area in north of site.



Photograph 3: Storage to sawn timber and empty oil drums. Some miscellaneous waste items and additional gravel stockpiles.



Photograph 4: Drainage channel along east of site.



Photograph 5: View west across site.



Photograph 6: Approximately 4-5m tall river gravel stockpile in south of site.



Photograph 7: Close up of gravel material stockpiled in south of site.



Photograph 8: Gravel screener.



Photograph 9: Silt and sand screening stockpiles with screen in south of site.



Photograph 10: Gravel stockpiles in south of site.



Photograph 11: Dark coloured soil in footprint of former house.



Photograph 12: Dark coloured soil in footprint of former house.

APPENDIX B

Record of Title



**COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952**



Search Copy


R. W. Muir
Registrar-General
of Land

Identifier **376526**
Land Registration District **Canterbury**
Date Issued 11 February 2008

Prior References

CB41C/1243

Estate Fee Simple
Area 8.0000 hectares more or less
Legal Description Lot 1 Deposited Plan 394101

Proprietors

Alistair John Dugald Cameron

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate A379029.1 - 25.11.1998 at 2:20 pm
The easement specified in Easement Certificate A379029.1 is subject to Section 243 (a) Resource Management Act 1991



T1/1

Digital Title Plan
 DP 394101
 Deposited on: 11/02/2008

Surveyor: Lloyd Robert McCarvey
 Firm: Cowan & Holmes

Lots 1 and 2 Being Subdivision of Lot 2 DP 71999

Land District: Canterbury
Dataset Type: Compiled
 Digitally Generated Plan
 Generated on: 12/02/2008 10:08am Page 2 of 2

APPENDIX C

Property File



080215004273

Aaron

Andrew BC

075481

PROCESSED IN TRIM

Permit N^o: V 080037

Val N^o: 21440-048-03

APPLICATION TO FORM A VEHICLE CROSSING (ENTRANCEWAY)
Made under Section 335 Local Government Act/Waimakariri District Vehicle Crossings Bylaw 1997

PLEASE READ:

- a) Your permit is valid for 12 months with your vehicle entrance to be completed within that period.
b) It is the property owner's responsibility to arrange and pay for the construction of a vehicle entrance.
c) A vehicle entrance constructed without Council inspections will be deemed as an illegal entrance.
d) A vehicle entrance must be formed to top-course stage prior to the commencement of any building work.
e) You or your Contractor will need to fill in a Temporary Traffic Management Plan at least 2 working days before construction (and you cannot work on the road or footpath until it has been approved. (If there is a need for public notification eg road closure, then additional notice is required.)

A Vehicle Crossing Information Pack is available from Council Service Centres. It contains specifications and additional information as well as plans for typical urban and rural vehicle crossings.

1) PROPERTY OWNER

CONTRACTOR

Name: AJ Cameron
Postal Address: c/o 90 East Bell Rangiora
Phone No: 03 313 6836
Contact Name: A J Cameron
Postal Address: 35 Pinetree Rd Hokitika
Phone No: 03 7558 284 - 0274 330 967

2) ADDRESS OF PROPOSED VEHICLE ENTRANCE

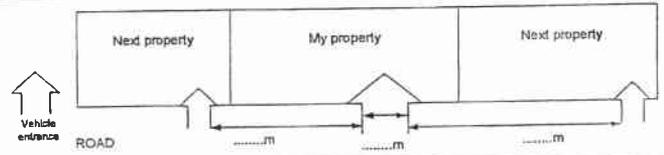
Street: LOWER SETTON ROAD
Town/area: ASHLEY
Legal Description/Valuation Number:

3) LOCATION SKETCH

Please type of vehicle crossing: Residential [] Rural [x] Commercial / Industrial []

This was inspected 7-2-08
Sketch showing property boundaries and distances to nearest vehicle crossings on Lower Setton Rd.

Please sketch above the location, width of vehicle crossing and distances to the nearest vehicle crossings on the same side of the road. If more relevant (eg when adjacent vehicle crossings have yet to be formed) please show distance to neighbouring boundaries / nearest intersection if by corner.



TO COMPLETE THIS APPLICATION, PLEASE READ AND SIGN THE REVERSE SIDE OF THIS SHEET

4) **VEHICLE CROSSING INSPECTIONS**

- I will notify the Council 2 working days prior to excavation to confirm location and make arrangements for consequent inspections.
- Telephone numbers: Rangiora and Oxford (03) 313 6136, Kaiapoi direct line 327 6834

5) **DECLARATION**

- I will construct a vehicle crossing (entranceway) that complies with any Resource Consent and meets Council specifications from the formed roadway to my property. Between the initial construction and final surfacing of the vehicle crossing, the crossing will be kept in good condition to allow for the safe passage of pedestrians.
- I note that stamped concrete, coloured concrete, cobbles and non standard paving blocks are NOT permitted.
- I understand that all costs are the responsibility of the property owner and that a vehicle crossing that does not meet Council specifications will be upgraded at the property owner's cost.
- I understand that I will be responsible for the costs associated with any repair work required as a result of settlement or poor workmanship during a 12-month period of maintenance.

Fee of \$60 attached

Owner's Signature

Signature: Andrew P. Cameron Name: AS Cameron Date: 8/2/08

Waimakariri District Council, Private Bag 1005, Rangiora - Telephone 03 313 6136, Fax 03 313 4432

FOR OFFICE USE ONLY

	Front Counter	Roading	Plan Admin	CSO - PIMs	
Circ:			OK Andrew		
				Zone:	

Receipt Number: _____

Entered onto Vehicle Crossing database VC N^o: _____

INSPECTION TYPE	YES	NO	DATE	COMMENTS	INSPECTED BY:
Location / Excavation	✓		5/2/08		<u>Andrew</u>
Sub grade completed satisfactorily			7/2/08		<u>Andrew</u>
Base course completed satisfactorily					
Final surfacing completed satisfactorily					

Additional Inspections - DATE: _____ COMMENTS: _____

Please file copy on Property File when Vehicle Crossing completed



Our Reference: VC Permit N° VC080037

Website: www.waimakariri.govt.nz

Valuation N°: 2144004803
Legal Description: Lot 2 DP 71999
Building Consent N°:

14 February 2008

A J CAMERON
C/- 90 EAST BELT
RANGIORA

VEHICLE CROSSING PERMIT



Address for Vehicle Crossing: LOWER SEFTON ROAD SEFTON

The vehicle crossing described on your application form has been approved subject to the conditions of this Vehicle Crossing Permit. Your Vehicle Crossing Permit is valid for 12-months, with constructions works to be completed within that time and subject to the crossing being constructed in accordance with Council requirements.

SERVICE PLANS

Please note that it is your Contractor's responsibility to locate all underground services. No services are to be moved without the written permission of the service provider.

When locating services from service plans, your contractor will need to dig for and confirm the exact location of the service. When excavating in the vicinity of any services, your contractor will be held responsible for any damage.

ROAD SAFETY

You and your contractor are both responsible for the safety of this site, including that of pedestrians and other road users. This requires that between initial construction and final surfacing, the Vehicle Crossing be kept in good condition to allow for the safe passage of pedestrians.

At least two days prior to the planned commencement of any construction work, a Temporary Traffic Management Plan must be lodged with the Council. You must have your Temporary Traffic Management Plan approved before commencing any construction work.

(The Temporary Traffic Management Plan is to be completed in accordance with Transit NZ Code of Practice for Temporary Traffic Management – Interim July 2000.) A copy of requirements is included in the Vehicle Crossing Information Pack available from Council Service Centres.

If there is a requirement for public notification (eg road closure), the proposed Temporary Traffic Management Plan must be received 5 days before any advertisement is to be placed.

INSPECTIONS

You are required to notify the Council 2 days prior to excavation to confirm location and make arrangements for consequent inspections.

CONTRACTORS

Anyone carrying out this work must have a minimum of \$1,000,000 Public Liability Insurance, and those carrying out the work need to be qualified to do so under the requirements of the NZ Code of Practice for Temporary Traffic Management.

ADDITIONAL REQUIREMENTS

CONSTRUCTION

- a) The vehicle crossing (entranceway) is to be constructed in accordance with Council specifications, including any Resource Consent conditions (to be addressed in your application) and other requirements listed on this permit from the formed roadway to your property.
- b) **The Vehicle Crossing must be formed to at least top-course stage prior to the commencement of any building work.**
- c) All costs are the responsibility of the owner, including the costs associated with any repair work required as a result of settlement or poor workmanship during a 12-month period of maintenance. A vehicle crossing that does not meet Council specifications will be upgraded at the property owner's cost.
- d) A vehicle crossing constructed without Council inspections will be deemed as an illegal entrance.
- e) You are reminded that stamped concrete, coloured concrete, cobbles and non-standard paving blocks are not permitted.

A Vehicle Crossing Information Pack is available from Council Service Centres. It contains a copy of the Standard Specification for Footpaths, Crossings and Berms (QP-C813-AC), plans for typical urban and rural Vehicle Crossings and other information.



A Reid



Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear Sir/Madam

Thank you for submitting your property enquiry from our Listed Land Use Register (LLUR). The LLUR holds information about sites that have been used or are currently used for activities which have the potential to cause contamination.

The LLUR statement shows the land parcel(s) you enquired about and provides information regarding any potential LLUR sites within a specified radius.

Please note that if a property is not currently registered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR database is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; additional relevant information may be held in other files (for example consent and enforcement files).

Please contact Environment Canterbury if you wish to discuss the contents of this property statement.

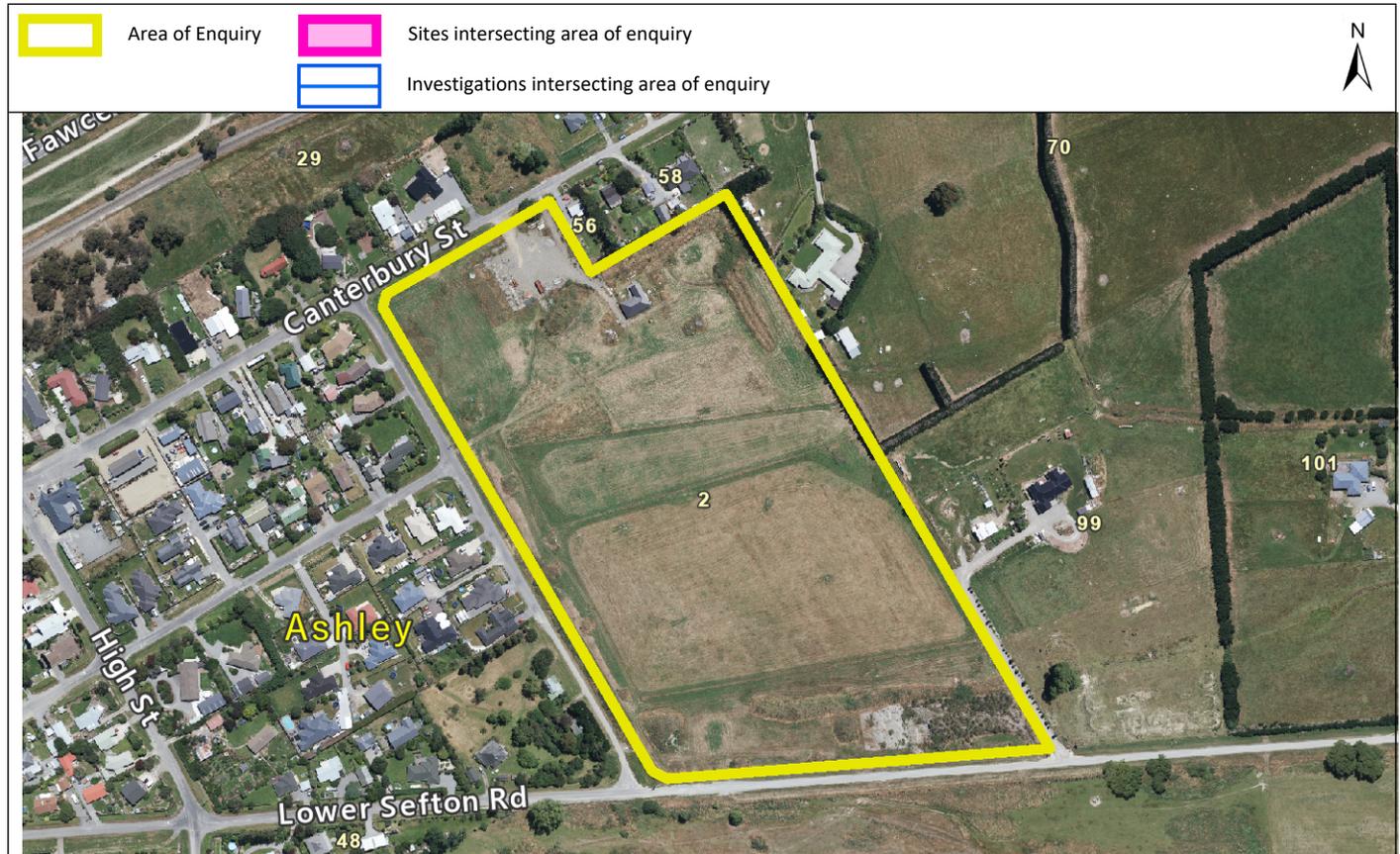
Yours sincerely

Contaminated Sites Team

Property Statement from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or contact Customer Services at ecan.govt.nz/contact/ and quote ENQ360245

Date generated: 22 November 2023
Land parcels: Lot 1 DP 394101



The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Sites at a glance

 Sites within enquiry area

There are no sites associated with the area of enquiry.

More detail about the sites

There are no sites associated with the area of enquiry.

Disclaimer

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

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the

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

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

Listed Land Use Register

What you need to know



What is the Listed Land Use Register (LLUR)?

The LLUR is a database that Environment Canterbury uses to manage information about land that is, or has been, associated with the use, storage or disposal of hazardous substances.

Why do we need the LLUR?

Some activities and industries are hazardous and can potentially contaminate land or water. We need the LLUR to help us manage information about land which could pose a risk to your health and the environment because of its current or former land use.

Section 30 of the Resource Management Act (RMA, 1991) requires Environment Canterbury to investigate, identify and monitor contaminated land. To do this we follow national guidelines and use the LLUR to help us manage the information.

The information we collect also helps your local district or city council to fulfil its functions under the RMA. One of these is implementing the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil, which came into effect on 1 January 2012.

For information on the NES, contact your city or district council.

How does Environment Canterbury identify sites to be included on the LLUR?

We identify sites to be included on the LLUR based on a list of land uses produced by the Ministry for the Environment (MfE). This is called the Hazardous Activities and Industries List (HAIL)¹. The HAIL has 53 different activities, and includes land uses such as fuel storage sites, orchards, timber treatment yards, landfills, sheep dips and any other activities where hazardous substances could cause land and water contamination.

We have two main ways of identifying HAIL sites:

- We are actively identifying sites in each district using historic records and aerial photographs. This project started in 2008 and is ongoing.
- We also receive information from other sources, such as environmental site investigation reports submitted to us as a requirement of the Regional Plan, and in resource consent applications.

¹The Hazardous Activities and Industries List (HAIL) can be downloaded from MfE's website www.mfe.govt.nz, keyword search HAIL

How does Environment Canterbury classify sites on the LLUR?

Where we have identified a HAIL land use, we review all the available information, which may include investigation reports if we have them. We then assign the site a category on the LLUR. The category is intended to best describe what we know about the land use and potential contamination at the site and is signed off by a senior staff member.

Please refer to the Site Categories and Definitions factsheet for further information.

What does Environment Canterbury do with the information on the LLUR?

The LLUR is available online at www.llur.ecan.govt.nz. We mainly receive enquiries from potential property buyers and environmental consultants or engineers working on sites. An inquirer would typically receive a summary of any information we hold, including the category assigned to the site and a list of any investigation reports.

We may also use the information to prioritise sites for further investigation, remediation and management, to aid with planning, and to help assess resource consent applications. These are some of our other responsibilities under the RMA.

If you are conducting an environmental investigation or removing an underground storage tank at your property, you will need to comply with the rules in the Regional Plan and send us a copy of the report. This means we can keep our records accurate and up-to-date, and we can assign your property an appropriate category on the LLUR. To find out more, visit www.ecan.govt.nz/HAIL.



My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.



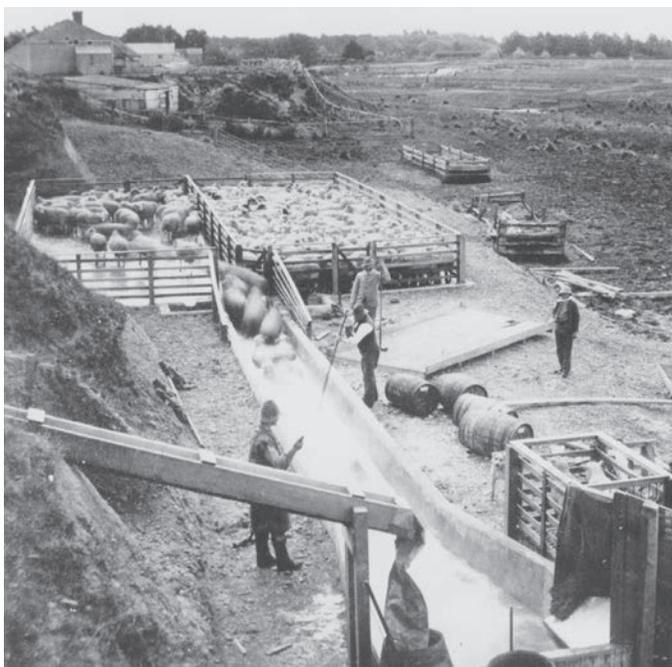
I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

IMPORTANT!

The LLUR is an online database which we are continually updating. A property may not currently be registered on the LLUR, but this does not necessarily mean that it hasn't had a HAIL use in the past.



Sheep dipping (ABOVE) and gas works (TOP) are among the former land uses that have been identified as potentially hazardous. (Photo above by Wheeler & Son in 1987, courtesy of Canterbury Museum.)

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:

Calling from Christchurch: (03) 353 9007

Calling from any other area: 0800 EC INFO (32 4636)



Everything is connected

Promoting quality of life through balanced resource management.

www.ecan.govt.nz

E13/101

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment Canterbury for further information:

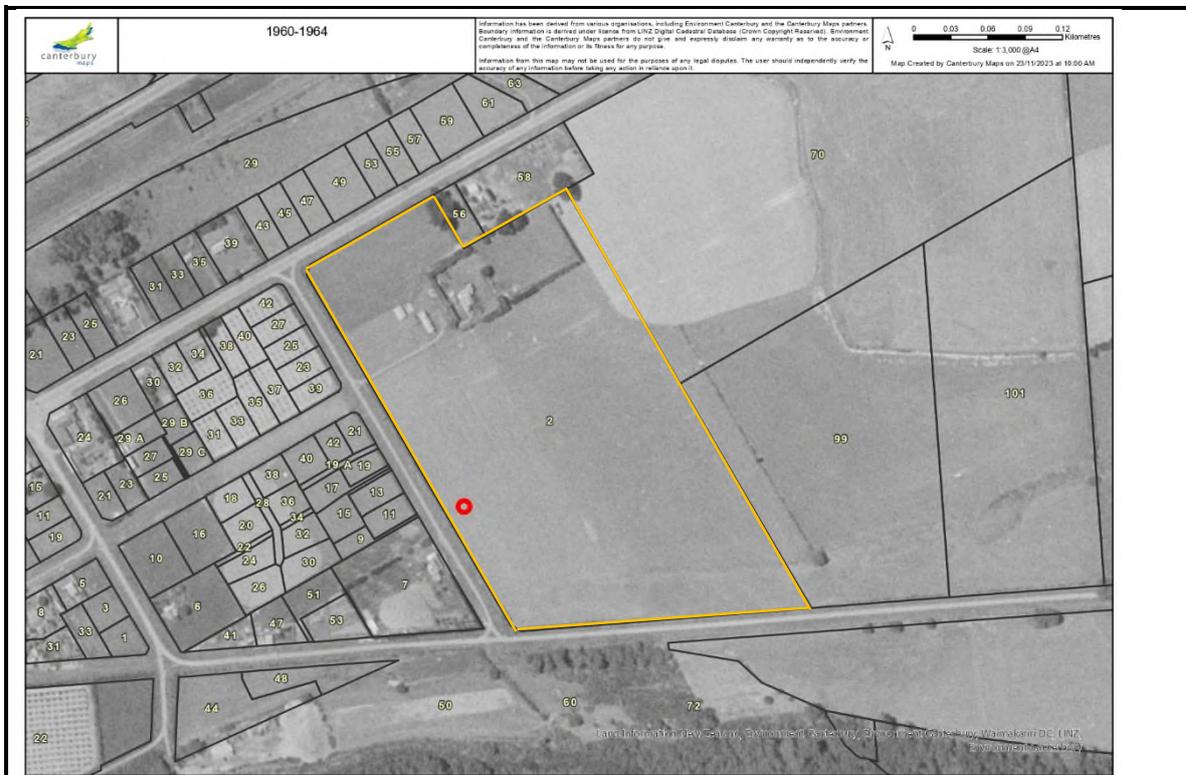
(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz

APPENDIX E

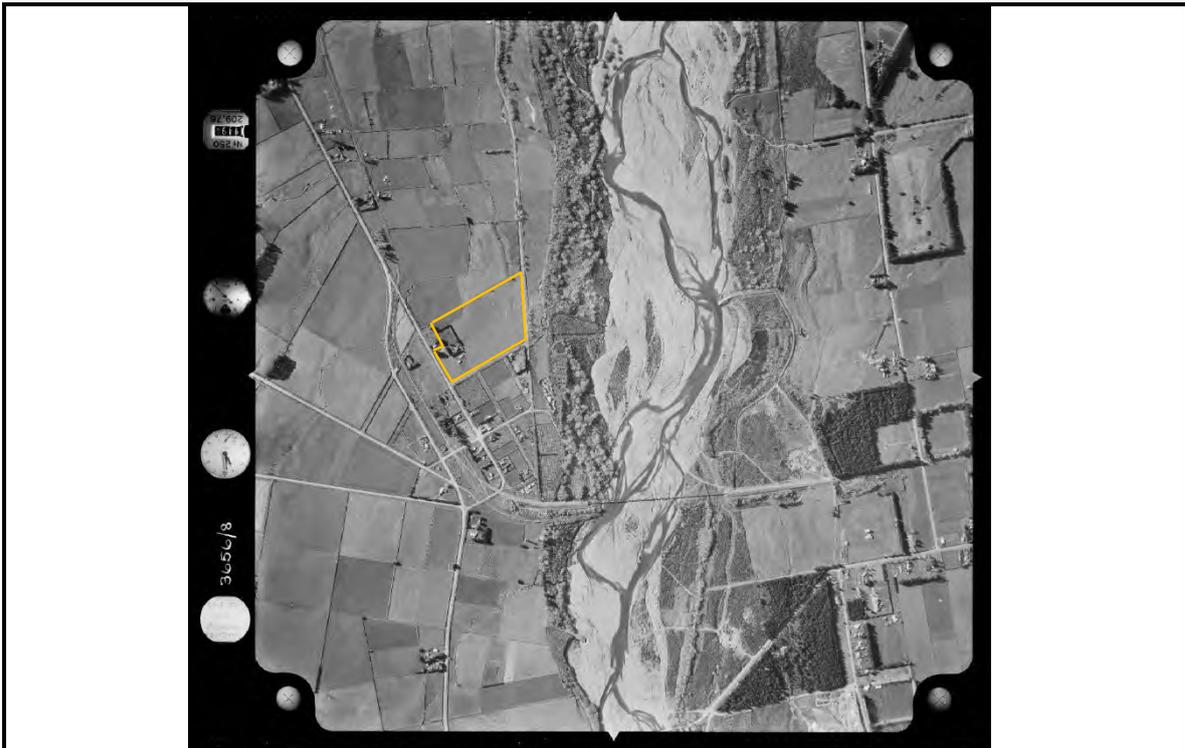
Historic Photolog



Photograph 1: Historical image from 1940-1944. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 2: Historical image from 1960-1964. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



© Sourced from <http://retrolens.nz> and licensed by LINZ.

Photograph 3: Historical image from 1963. Site boundaries indicated by yellow line. Sourced from Retrolens.



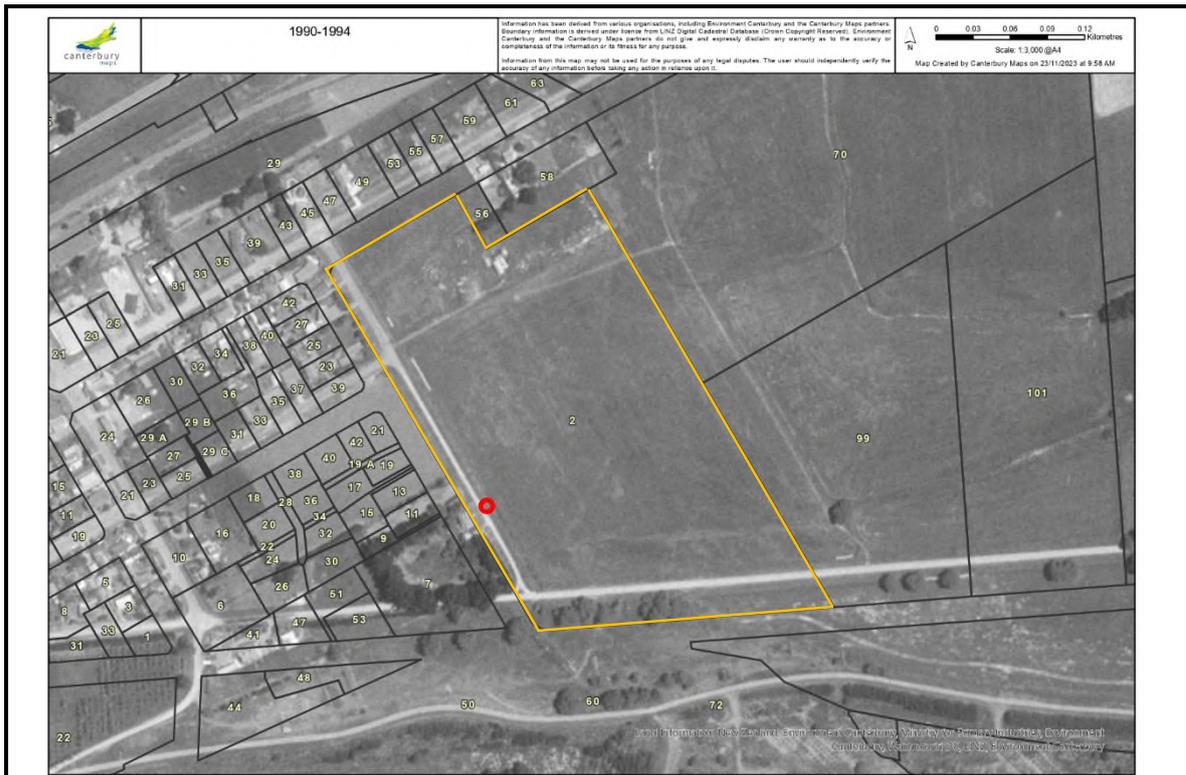
Photograph 4: Historical image from 1965-1969. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 5: Historical image from 1970-1974. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 6: Historical image from 1975-1979. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 7: Historical image from 1990-1994. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



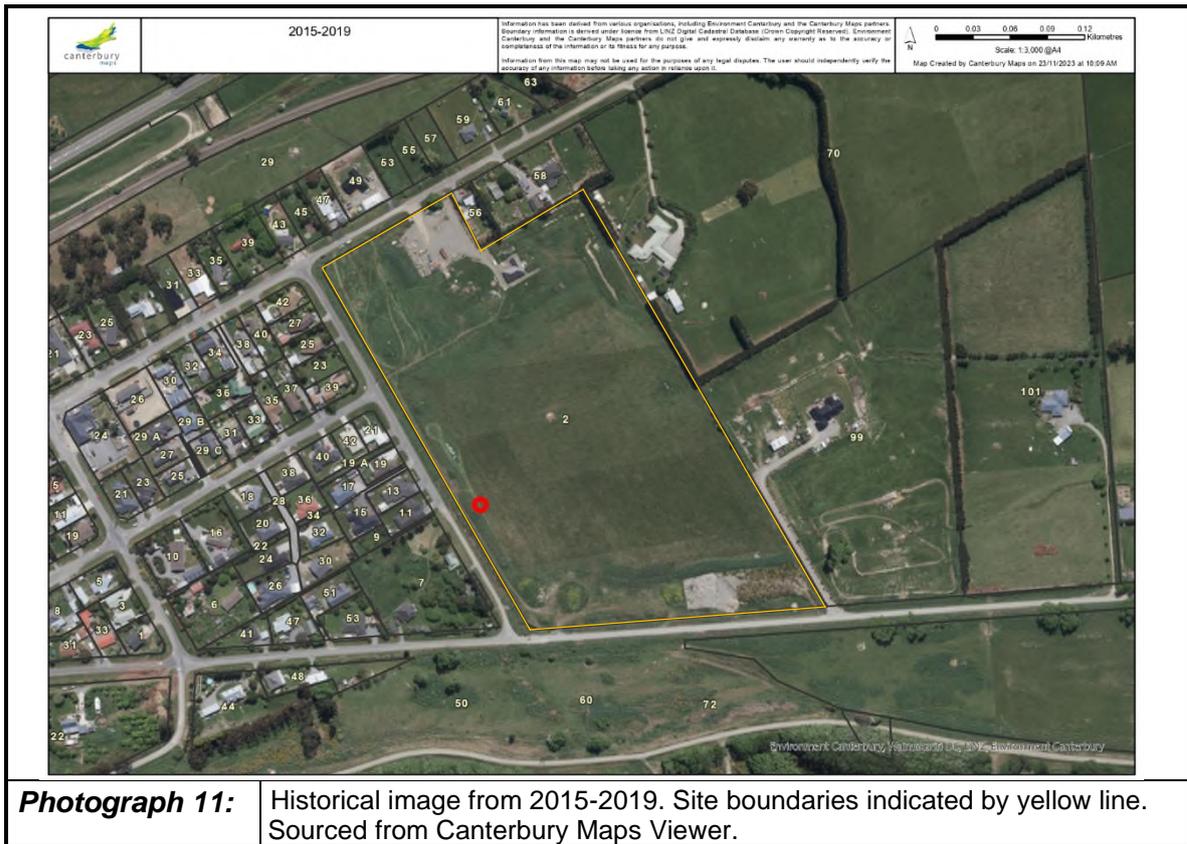
Photograph 8: Historical image from 1995-1999. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 9: Historical image from 2005-2009. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



Photograph 10: Historical image from 2010-2014. Site boundaries indicated by yellow line. Sourced from Canterbury Maps Viewer.



APPENDIX F

Laboratory Analytical Reports

Instrument	Reading #	Date	Time	Method N:	Test Label	Collimatio	Units	Cr	Concen	Cr	Error1s	Mn	Concei	Mn	Error1	Fe	Concen	Fe	Error1s	Co	Concen	Co	Error1s	Ni	Concen	Ni	Error1s	Cu	Concen	Cu	Error1s	Zn	Concen	Zn	Error1s	As	Concen	As	Error1s	Cd	Concen	Cd	Error1s	Pb	Concen	Pb	Error1s	Info	Real Time	Real Time	Real Time 3
801058	1	30/11/2023	16:01:39	Soil(3)	1	No	PPM	477	6	122	2	93	5	<LOD	3	<LOD	7	<LOD	5	8	1	<LOD	2	<LOD	13	3	1	blank	20	20	20																				
801058	2	30/11/2023	16:03:01	Soil(3)	2	No	PPM	155	7	759	6	23020	108	28	9	17	4	121	3	363	5	111	5	56	5	1292	8	test	20	20	20																				
801058	3	30/11/2023	16:05:23	Soil(3)	3	No	PPM	51	5	467	4	11441	60	18	6	<LOD	9	490	6	672	6	51	3	<LOD	15	639	5	ASH-so1A	20	20	20																				
801058	4	30/11/2023	16:06:44	Soil(3)	4	No	PPM	<LOD	12	314	3	9086	42	18	5	<LOD	7	212	3	320	3	24	2	<LOD	12	174	2	ASH-so1B	20	20	20																				
801058	5	30/11/2023	16:08:05	Soil(3)	5	No	PPM	82	6	218	3	10027	52	18	6	<LOD	9	25	2	1090	8	35	7	<LOD	14	2942	14	ASH-so2A	20	20	20																				
801058	6	30/11/2023	16:09:23	Soil(3)	6	No	PPM	93	6	242	3	10706	55	18	6	<LOD	9	35	2	1104	8	55	6	<LOD	13	1992	10	ASH-so2B	20	20	20																				
801058	7	30/11/2023	16:10:44	Soil(3)	7	No	PPM	37	5	369	3	10916	50	23	5	<LOD	8	18	2	290	3	<LOD	6	<LOD	12	286	3	ASH-so3A	20	20	20																				
801058	8	30/11/2023	16:12:05	Soil(3)	8	No	PPM	<LOD	13	374	3	11626	51	18	5	16	3	15	2	330	3	8	2	<LOD	12	306	3	ASH-so3B	20	20	20																				
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801058	11	30/11/2023	16:16:10	Soil(3)	11	No	PPM	<LOD	15	451	4	15334	63	41	6	9	3	10	2	50	2	6	1	<LOD	12	24	1	ASH-so5A	20	20	20																				
801058	12	30/11/2023	16:17:24	Soil(3)	12	No	PPM	<LOD	17	415	4	19787	83	45	7	<LOD	8	11	2	50	2	8	1	<LOD	12	27	1	ASH-so5B	20	20	20																				



TERRA SCIENTIFIC
Laboratory Specialists

CHAIN OF CUSTODY FORM – ENVIRONMENTAL ANALYSIS

Client Name: DAVIS OGILVIE
Address: 24 Moorhouse Ave, Christchurch 8011

Requested Turnaround Time
Urgent Standard

Client Contact: Gareth Oddy
Phone: 0800999333
Client/Site Reference: 37211

Requested Report Date:
Urgent turnarounds are dependent on laboratory availability. Please contact the lab prior to submission.

Order #:
Report Email: gareth@do.nz
Accounts Email: admin@do.nz

CHAIN OF CUSTODY RECORD – TERRA USE	
Received By:	Finley Perharic
Signed:	<i>[Signature]</i>
Date & Time:	30/01/24 2:15pm
Due Date:	1/02/24 5pm
Job Number:	1011892
Received Condition	
Sample Condition:	
Sample Chilled?	
Temperature (°C):	

Sent to Terra Scientific
Date & Time: 30/1/24, 14:20
Name: Andy Bruce
Signature: *[Signature]*

SAMPLE INFORMATION					
#	Sample Description	Sample Date	Sample Time	Sample Type (See Key)	Tests Required
1	ASA - S01	30/11/23	DAY	SOIL	Heavy Metals (8)
2	ASA - S02	30/11/23	DAY	SOIL	Heavy Metals (8)
3	ASA - S03	30/11/23	DAY	SOIL	Heavy Metals (8)
4	ASA - S04	30/11/23	DAY	SOIL	Heavy Metals (8)
5	ASA - S05	30/11/23	DAY	SOIL	Heavy Metals (8)
Sample Key: B – Building Material, S – Soil/Sludge/Solids, W – Water, P – Paint, O – Other					
Additional Information:					
By completing this Chain of Custody Form you are agreeing to Terra Scientific's terms and conditions, which are available on request					



Version Number: 4

Date Issued: January 2023

Authorised By: JG

Controlled Document

Client Name:	Davis Ogilvie	Job Number:	T011892	Total Samples	5
Client Address:	Level 1/24 Moorhouse Avenue, Addington, Christchurch, 8011	Site Reference/ Address:	37211	Date Received:	30/01/2024
Client Reference:	37211			Date Analysed:	30-31/01/2024
Client Contact:	Gareth Oddy			Date Reported:	1/02/2024

SOIL ANALYSIS REPORT

Laboratory sample number	T011892.1	T011892.2	T011892.3	T011892.4	T011892.5
Client sample number	1	2	3	4	5
Sample description	ASA_S01	ASA_S02	ASA_S03	ASA_S04	ASA_S05
Sample date	30/11/2023	30/11/2023	30/11/2023	30/11/2023	30/11/2023
Sample time	Day	Day	Day	Day	Day
Dry Matter %	71%	80%	81%	90%	86%

Total Recoverable Elements in Soil

Total Recoverable Arsenic	mg/kg dry wt	31	6.4	4.2	5.9	3.9
Total Recoverable Cadmium	mg/kg dry wt	2.2	0.93	0.20	0.14	0.033
Total Recoverable Chromium	mg/kg dry wt	20	14	10	16	11
Total Recoverable Copper	mg/kg dry wt	140	27	15	12	6.0
Total Recoverable Lead	mg/kg dry wt	1,773	5,236	361	32	22
Total Recoverable Mercury	mg/kg dry wt	0.050	0.11	0.13	0.10	0.062
Total Recoverable Nickel	mg/kg dry wt	7.3	5.5	6.7	14	6.1
Total Recoverable Zinc	mg/kg dry wt	739	1,422	280	87	40

Report comments

Methodology:

In-house procedures based on EPA 200.2 Sample Preparation Procedure for Spectrochemical Determination of Total Recoverable Elements, Revision 2.8, 1994

The results presented in this report relate specifically to the samples submitted for this job and corresponding QA/QC tests. Samples are reported 'As Received'. Terra Scientific takes no responsibility for sampling processes, client sample descriptions and sample locations as these were provided by the client.

Disclaimers:

Samples were analysed within the recommended holding time unless otherwise noted.

QA/QC procedures were conducted in accordance with inhouse procedures. Further QA/QC raw data is available on request.

Detection limits may vary depending on sample amount received, matrix type or if further sample dilutions are required.

This report shall not be reproduced, except in full, without the written consent of the Key Technical Person assigned to this report.

For any queries regarding this report, please do not hesitate to contact the laboratory and speak with the Key Technical Personnel.

Dr Hayley Jensen
Laboratory Technician
Key Technical Person

APPENDIX G

Assessment Table

2 Auckland Street, Ashley - Heavy Metal Analytical Results						Tier 1 Assessment Criteria (mg/kg)					
Sample Name	ASA_S01	ASA_S02	ASA_S03	ASA_S04	ASA_S05	Background Concentration (YGE regional soil type)	Australian and New Zealand Guidelines for Fresh and Marine Water Quality - GV-high ⁶	NES SCSs ¹ for Protection of Human Health based on a Residential 10% land use ⁴	Frews Managed Fill, Plantation Road, Hororata Cover Soil Maximum WAC (Residential (10% Produce) land Use Guidelines) Class 3 & 4 Managed Fill	Frews Managed Fill, Plantation Road, Hororata Cover Soil Maximum WAC Class 3 & 4 Managed Fill	Class 1 Landfill. Transwaste Canterbury, Kate Valley Regional Landfill ⁷
Date Collected	30-Nov-23										
Sample depth (m bgl)	0.1	0.1	0.1	0.1	0.1						
Soil Type	Topsoil/ash	Topsoil/ash	Topsoil/ash	Topsoil	Topsoil						
Heavy Metals (mg/kg dry weight)											
Arsenic	31	6	4	6	4	4.9	70	20	20	140	100
Cadmium	2.20	0.93	0.20	0.14	0.03	0.13	10	3	3	55	20
Chromium ²	20	14	10	16	11	16.9	370	460	37	375	100
Copper	140	27	15	12	6	12.4	270	>10000	100	500	100
Lead	1773	5236	361	32	22	21.3	220	210	210	500	100
Mercury	0.05	0.11	0.13	0.10	0.06	0.11	1	310	0.2	0.2	4
Nickel ³	7.3	5.5	6.7	14.0	6.1	13.1	52	400	400	2000	200
Zinc ³	739	1422	280	87	40	69.6	14	7400	1000	1800	200

Note:

Grey shaded: Value exceeds adopted background or ambient concentrations

Red: Value exceeds ANZ Guidelines for Fresh and Marine water quality

Bold and Underlined values are above the SCS or international risk based concentrations

m bgl - metres below ground level

PPM = Parts Per Million

<LOD = concentration less than the limit of detection (LOR)

NL = No Limit available

1. Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

2. NESCS SCS criteria presented are for Chromium (VI)

3. National Environment Protection Council (NEPC) (2013). National Environmental Protection (Assessment of Site Contamination) Measure as amended in 2013 Schedule B1, Health Investigation Levels (HIL) for soil contaminants based on residential land use.

4. NESCS (2011) soil quality land-use SCSs for the protection of human health.

5. Ecan Background concentrations of selected trace elements in Canterbury soils Report No. R07/1.

6. Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines. Recommended default guideline values for toxicants in sediment. Guideline values - High.

7. Transwaste values are taken from: MfE Module 2 - Hazardous Waste Guidelines: Landfill Waste Acceptance Criteria and Landfill Classification.