



109 Works Road, Fairton, Ashburton

Preliminary Site Investigation (Ground Contamination)

TALLEY'S GROUP LTD

WWLA1240 | Rev. 1

30 August 2024



109 Works Road, Fairton, Ashburton

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1	30 August 2024	Preliminary Site Investigation (Ground Contamination) for proposed plan change	Cherise Martin	Shane Moore	Wendi Williamson

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Investigation Summary

Williamson Water & Land Advisory (WWLA) has prepared this preliminary site investigation (PSI) with limited sampling to support Talley's Group Ltd (Talley's) with rezoning of land at 109 Works Road, Fairton, Ashburton. The key findings of this report are:

History and potential for contamination [Section 3]	An evaluation of past activities against the Ministry for the Environment's Hazardous Activities and Industries List (HAIL; those with potential to cause ground contamination) confirms HAIL activities have occurred on the site. - The site was used as a freezing works (meat processing) for over one hundred years. The site can be divided into three portions as follows: - The eastern portion of the site was largely in pastoral use but also included residential dwellings and a cricket ground associated with the freezing works. - The western portion of the site was used for coal storage (for boilers within the freezing works) and gravel extraction. This portion of the site was later filled with site derived materials, including coal wastes and boiler ash, but has since been remediated during development of the Fairfield Freight Hub (FFH). Contaminated materials are now encapsulated both inground and within two above ground containment bunds. - The central portion of the site was occupied by the main meat processing/ freezing works plant which included several large buildings, stockyards, rail sidings and sediment ponds. The freezing works were improved and expanded over time. A range of HAIL activities have been associated with the above uses. - To inform the plan change process a soil sampling programme was designed to assess readily accessible areas. The objective was to understand the potential for ground contamination in areas not previously tested during development of the FFH and consenting of the proposed solar farm project. Soil samples were collected from 16 additional locations.
Sampling observations and laboratory results and discussion [Section 4]	In summary, only the concentrations of asbestos exceed the relevant guidelines for the protection of human health under a commercial / industrial land use. The key observations and findings are: - Surficial materials (topsoil and fill) are generally present to a depth of up to 0.5 m across the site. Fill depths are locally deeper, being encountered to approximately 2 m depth near the stormwater retention basin. - Testing of the surficial materials confirms anthropogenic influences, particularly in the vicinity of former residential dwellings and where the previous freezing works plant had been demolished. - While the concentrations of asbestos exceed the relevant guidelines for the protection of human health under a commercial / industrial land use, the elevated concentrations of asbestos appear to be localised and/or covered. On this basis asbestos is therefore unlikely to present an unacceptable risk to health unless these areas are disturbed by future excavation works. - Only the concentrations of zinc in some samples collected from the vicinity of former residential dwellings and around the former freezing works plant area exceed the Eco-SGVs. However, considered in the context of the wider site, distance to sensitive environmental receptors, and low mobility of zinc in soils, the concentrations are not considered to present an unacceptable risk to the environment.
Preliminary conceptual site model (CSM) [Section 5]	A CSM was developed to show if there are potential ground contamination risks in the context of the proposed plan change, in summary no unacceptable risks are indicated. However, if disturbance or redevelopment of the site is proposed in future, then further testing will likely be required to better quantify development specific contamination risks and consenting and earthworks management requirements.
Consenting implications [Section 6.1]	Ground contamination related consents are not required under either the NESCS or CLWRP for the proposed plan change. - Other than for small scale projects, consent is likely to be required under the NESCS for future disturbance and/or redevelopment of the site. Consent applications are expected to need to be supported by: - Further soil testing to confirm the consent activity status and to better quantify development specific contamination risks and earthworks management requirements. - A Site Management Plan (SMP). An SMP is also recommended to support works undertaken under the permitted activity provisions of the NESCS.

Earthworks implications [Section 6.2]	Earthworks implications are provided for reference against future site disturbance or development works. Where it is not already covered, or will be exposed by future works, either remediation or management (covering) of fill containing elevated concentrations of asbestos will be required. • To date this fill has only been identified in the central portion of the site, associated with the former freezing works plant and associated facilities. • Aside from controls required to remediate or cover fill containing elevated concentrations of asbestos, construction related earthworks are expected to be managed under standard earthworks controls and procedures. • With the exception of fill containing elevated concentrations of asbestos, materials can be reused onsite where geotechnically suitable. • Fill containing elevated concentrations of asbestos can only be reused where it will be covered by hard surfacing (asphalt, concrete or similar) or by a minimum 200 mm thickness of cleanfill (soil, gravel etc.). • Most of the surficial materials are unlikely to be accepted for disposal as cleanfill. These materials would be required to be disposed of as managed fill (or Class 3 material). • Deeper natural are suitable for disposal as cleanfill. • If surplus to site requirements fill containing elevated concentrations of asbestos is likely to require disposal to landfill unless a managed fill that can accept asbestos is available.
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1. Introduction

Williamson Water & Land Advisory (WWLA) has prepared this Preliminary Site Investigation (PSI) with limited sampling report to assist Talley's Group Ltd (Talley's) with the rezoning of land at 109 Works Road, Fairton, Ashburton (the 'Site'). The site is outlined in red on **Figure 1**.



Figure 1. Site Location
Approximate site boundary outlined in red

(Aerial source: LINZ)

1.1 Background

Talley's is proposing a private plan change to take the current zoning of its Fairfield site from a spot business zone (F) to a more typical industrial zone (E) consistent with adjacent properties. Talley's has recently redeveloped the south-western corner of the site as a freight and logistics hub also known as the Fairfield Freight Hub (FFH) and is proposing to redevelop the north-eastern corner as a solar farm (78 Fairfield Road West). WWLA has prepared and provided Environment Canterbury (ECan) and Ashburton District Council (ADC) with preliminary and detailed site investigations (PSI/DSI)^{1, 2} relating to those portions of the site. However, as use of the remainder of the site may also have included activities with the potential to cause ground contamination (otherwise known as HAIL activities³) changing its zoning may trigger the requirements of the NESCS⁴. We understand that during a recent pre-application meeting ADC expressed a desire to see a DSI in support of the plan change application.

In our opinion the existing testing information available from the FFH and Solar Farm projects, supplemented by further desk study information should be sufficient to support the proposed plan change (i.e. a full DSI is not

¹ WWLA. 29 August 2022, Fairfield Freight Hub, Site Clearance Works- Preliminary and Detailed Site Investigation (Ground Contamination). Prepared for Talley's Ltd. Ref:WWLA0655 Rev2.

² WWLA. 3 May 2024, 78 Fairfield Road West and 125 Fairfield Road, Fairton, Ashburton- Preliminary and Detailed Site Investigation (Ground Contamination). Prepared for Talley's Ltd. Ref:WWLA1137 Rev2.

³ As defined by the [Ministry for the Environment's Hazardous Activities and Industries List \(HAIL\)](#)

⁴ Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

required). However, we appreciate the reasons behind ADC's request and given geotechnical investigations were required in any case, we have combined efforts and collected some targeted soil testing data to support both ADC's request and the requirements of the NESCS.

1.2 Scope of work

The scope of this investigation comprised:

1. Assessment of the site's history comprising:
 - a) Collation of relevant information from our work on the FFH and Solar Farm projects;
 - b) Review of:
 - Historical aerial photographs sourced from [Retrolens](#) and [Google Earth](#);
 - The ECan Listed Land Use Register (LLUR); and
 - Ashburton District Council Property Information report.
2. A site walkover inspection by a suitably qualified environmental practitioner (SQEP) i.e. contaminated land specialist.
3. Assessment of the potential for contamination, based on current and historical land use and evaluation of that against the HAIL.
4. Collection of soil samples and laboratory analysis to provide a preliminary assessment of potential impacts from HAIL activities identified within the site.
5. Development of a conceptual site model (CSM) to assess contaminant risks in the context of the proposed plan change.
6. Evaluation of ground contamination consenting requirements in the context of the proposed plan change.

1.3 Legislative requirements

WWLA has undertaken the investigations and prepared this report in general accordance with requirements of published industry best practice guidance, including:

- Ministry for the Environment (MfE) [Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand \(Revised 2021\)](#), (CLMG1);
- MfE's [Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils \(Revised 2021\)](#), (CLMG5);
- New Zealand Guidelines for Assessing and Managing Asbestos in Soil (NZAG; BRANZ, November 2017).

This report has been prepared, reviewed, and certified by a SQEP as described in the NESCS and NESCS User's Guide⁵. CVs confirming the SQEP status of our contaminated land specialists are available on request.

⁵ Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

2. Site Setting

The site is described in **Table 1** (as recorded on ADC's Rateable Property Information map) and shown in **Figure 1**.

Table 1. Site identification

Address	Legal description	Certificate of title	Site area
109 Works Road, Fairton	Lot 2 DP 413606	CB9A/903	32.11 ha

The environmental setting is described in **Table 2**. The features of the environmental setting are considered in the context of their potential to affect the distribution, mobility and form of contaminants (if present). These variables set the scene and inform the preliminary conceptual site model (CSM) evaluation (**Section 5**), if it is established that activities with potential to cause ground contamination have occurred.

Table 2. Environmental setting

Surrounding land use	The site is bordered by Fairfield Road to the east, Works Road to the south and west and the South Island Main Trunk railway line to the north. The surrounding area is predominantly used for pasture and cropping but Fairton township is located immediately to the east beyond Fairfield Road. An industrial area, extending from the outskirts of Ashburton and Newland, is developing immediately to the west beyond Works Road / Jb Cullen Drive.
Topography and drainage	<i>The topography and drainage influences where contaminants may migrate to if present and surface water features are potential receiving environments for contaminants (if any) derived from the site.</i> The site is relatively flat at between approximately 100 -110 m RL. The Wakanui Creek and the Ashburton River lie approximately 4 km and 6.5 km west of the site respectively. Surface water flows are typically controlled by a network of drains / water races which eventually discharge into the Ashburton River, Wakanui Creek, or at the coast into the Canterbury Bight.
Geology	<i>Geological conditions are considered in the context of describing the conceptual site model (CSM, Section 5) should a potential for contamination be identified by this desk study. For example, more porous soils can enable contaminants (if present) to move more quickly and potentially further than clay-rich soils that retain/ bind or prevent penetration of contaminants.</i> Published geology ⁶ (Figure 2) describes the site to be underlain by undifferentiated quaternary deposits, underlain by quartzofeldspathic sand with shell and basal pebble lag of the Karewa Group. Previous investigation ⁷ borehole data viewed on NZGD ⁸ completed on the wider Talley's property at 125 Fairfield Road confirms this stratigraphy with river alluvium deposits extending to at least 6.0 mBGL ⁹ .
Hydrogeology	<i>Hydrogeological conditions affect potential risk of contaminants (if present) entering and being transported in groundwater.</i> Monitoring wells installed by WWLA as part of the FFH showed groundwater at approximately 26 mBGL (bore references L37/0963, L37/0251, BY21/0545, BY21/0546). Groundwater contours and well data provided by Environment Canterbury ¹⁰ , indicate regional groundwater flow is to the southeast to the Canterbury Bight / Pacific Ocean (some 20 kms distant).
Sensitive receptors	<i>Sensitive environmental receptors could include aquatic or terrestrial ecosystems. This is not an ecological assessment but is instead an initial review of the surrounding environment to assess where contaminants (if present) on the site could migrate to and affect.</i> The Wakanui Creek and the Ashburton River and the associated ecosystems are the closest ecological receptors to the site.

⁶ P.J Forsyth. (compiler), 2008. Geology of the Christchurch area. Institute of Geological and Nuclear Sciences 1:250,000, geological map 16.

⁷ 26/01/2019 GHD Consultants - Geotechnical investigation at 125 Fairfield Road. BH02 borehole log and 28/01/2019 BH06 borehole log

⁸ New Zealand Geotechnical Database.

⁹ mBGL – meters below ground level.

¹⁰ <https://mapviewer.canterburymaps.govt.nz/>

Sensitive human receptors could for example be children at a school or kindergarten on or adjacent to a site. Workers on industrial land (including or adjacent to a site) would be considered less sensitive. This people receptor interpretation informs the CSM and also future guideline value selection for evaluation of soil data.

The site is surrounded by pastoral and cropping lands, which are not generally considered a sensitive land use as it is only occupied periodically by farm workers. The Fairton township could be considered to be sensitive if activities with the potential to cause ground contamination were to encroach on the eastern end of the site in future.



Figure 2. Published geology
Yellow mapped as undifferentiated quaternary deposits of the Karewa Group

(Source: P.J Forsyth, 2008)

3. HAIL Assessment

This section details a HAIL assessment, incorporating a walkover to establish current site activities and a review of historical activities to determine whether or not activities listed on MfE's HAIL have occurred on the site. The findings of the HAIL review inform the requirement and scope for the detailed investigations (sampling).

3.1 Site layout and current use

The site was visited by a SQEP from WWLA on 5 and 6 August 2024 but has also been visited previously during assessment of the FFH and proposed solar farm. For the purposes of describing the site in this report it has been split into three portions – eastern, central and western portions (approximately thirds). The following is a summary of the observations made by WWLA during our site walkover, from review of drone images and discussions with Mr Dean Robinson of Talley's. Selected photographs are provided below, and key site features are shown in **Figure 3** (overpage).

Eastern portion	• The eastern portion (Photograph 1) is accessed via Office Road which leads up to the Talley's Fairfield reception and offices. • This portion of the site is flat and largely in use as pasture. It is bound by a wire farm fence on all sides and mature trees in its southeastern corner and along the northern boundary. • Three residential dwellings are present, one (Dwelling No 1) in the northwestern corner and two dwellings (Dwelling No 2 and 3) approximately centrally along Office Road (refer to Figure 3 for locations). Each dwelling is accessed by paved driveway off Office Road. All are single-storey brick construction with galvanised steel roofs (Photograph 2). • Fairton Hall and adjoining tennis courts are located in the southeastern corner (Photograph 3). The tennis courts are surfaced with asphalt. • A former rail siding (rail infrastructure removed) separates this portion of the site from the central portion former freezing works plant area).
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Photograph 1. Drone image showing the eastern portion of the site (flown by Tarbotton Land & Civil, August 2024)



Photograph 2. Examples of properties located on Office Road



Photograph 3. Fairton Hall and tennis courts

Central portion

- The central portion (refer to **Photograph 4** and **Figure 3**) is accessed via Works Road which leads up to the Gate B, refer to the orange arrow in **Photograph 4**. The ground is generally paved (concreted or asphalted), with minor landscaping.
- Buildings comprising what was the former freezing works / meat processing facilities have recently been demolished, with concrete slabs and remnant gravelly fill evident within the former building footprints. The former sheep yards, cafeteria, boiler house, trades store, engine room, chiller no. 2 and substation have been demolished.
- The buildings remaining on site include a number of small storage sheds, the main office, chiller no. 1, and a large warehouse historically used for pallet storage. These are now used by Talley's for handling seasonal produce and cold storage.
- A pond, referred to by Talley's staff as the "lake" is present near the northern corner of this portion of the site. We understand that the pond is a stormwater retention feature.
- Two railway sidings cross the area, as shown in yellow on **Figure 3** and **Photograph 4**.



Photograph 4. Drone image showing the central portion of the site (flown by Tarbotton Land & Civil, August 2024).

Western portion

- Works Road continues through the western portion of the site (refer to **Photograph 5** and **Figure 3**), separating the FFH from a block of largely undeveloped land to the south.
- FFH has recently been redeveloped as a new container/ freight logistics centre for Ashburton which consists of one large warehouse surrounded by asphalt and concrete paved container and vehicle storage areas.
- To the east of FFH is the former pelt house, the former building slab is currently being used for crop sorting. At the time of the inspection Talley's staff were sorting carrots.
- South of the FFH and pelt house is vacant land, currently used largely for grazing. The following features were observed in this area:
 - Several ponds located to the south of the pelt house mark the location of the former wastewater treatment facility for the freezing works. We understand this facility has been decommissioned but Talley's are using one of the ponds for holding and mixing cattle truck effluent prior to it being irrigated on their wider properties.
 - A concrete slab near the south corner of the site marks where the former slinky (skin) shed was located.
 - An area of discoloured / distressed vegetation was noted near the centre of the grazing area. We understand that wood, timber and other burnables have historically been burnt at this location. For example a shelter belt was recently removed from around the slinky (skin) shed and burnt here.



Photograph 5. Drone image showing the central third (flown by Tarbotton Land & Civil, August 2024).



Map Title:
Site Features Plan

Project:
109 Works Road, Fairton
Ashburton

Client:
Talleys Group Ltd



Legend

- Site boundary
- Site features
- Features
- Railway sidings
- Areas (as discussed in Section 3.1)

Data Provenance
Aerial imagery and land parcels from Land Information New Zealand

Drawn by: Cherise Martin
29/08/2024

Layout Name
Site features Plan G:\Shared drives\Projects\Talleys Group Ltd\WWLA1240_Fairfield Private Plan Change\Technical\GIS\GIS Project Files\109 Works Road.gg

3.2 Site history

The historical review summarised in the following subsections found that the site was used as a freezing works (meat processing) for over one hundred years before it closed in 2019 and was subsequently purchased by Talley's. The site can be divided into three portions as follows:

- *The eastern portion of the site was largely in pastoral use with residential dwellings lining Office Road, and several others in the south and west of the area. A cricket pitch was also present up until the staged demolition/ removal of the dwellings between 1998 and 2023.*
- *The western portion of the site was used for coal storage (for boilers within the freezing works, coal storage ceased sometime after 1987. A gravel pit formed on this portion of the site and later filled with site derived materials, including coal wastes and boiler ash, was remediated during development of the FFH. Contaminated materials are now encapsulated both inground and within two above ground containment bunds.*
- *The central portion of the site was occupied by the main meat processing/ freezing works plant which included several large buildings, stockyards, rail sidings and sediment ponds. The freezing works were improved and expanded over time.*

3.2.1 Previous investigations

As described in **Section 1.1**, WWLA has previously completed investigations to support resource consent applications for development of the FFH, and the proposed development of a solar farm on the eastern portion of the site (see **Figure 3**). Information relevant to the proposed plan change is summarised below, however ADC holds copies of these investigations, and the reader is directed to the full reports for further detail (if needed).

3.2.1.1 Fairfield Freight Hub

A vacant portion of land adjacent to the western side of the former Fairfield Freezing Works has been developed into the FFH, a new container/ freight logistics centre for Ashburton.

The site previously contained a number of stockpiles and an infilled pit that was formerly used for gravel extraction. WWLA undertook a PSI/ DSI¹¹ to ascertain the history of use and of fill placement on the land, including contaminant levels in fill and natural insitu soils. The investigation found that the gravel pit (colloquially referred to as Tim's Bottom) contained demolition materials, site-won silty gravels and boiler ash with low to moderate levels of contaminants. The balance of the FFH site contained a large, vegetated stockpile (referred to as Conrad's Hill) that contained similar materials and contaminants.

The lease agreement for the development required Talley's to clear the site to a nominated elevation (underside of the topsoil layer at the site's natural elevation) including stripping geotechnically unsuitable topsoil, clearing and containing a large stockpile and remediating voids within the infilled former gravel pit.

WWLA prepared a Remediation Action and Site Management Plan (RAP/ SMP)¹¹ that set out procedures for undertaking the clearance works and for encapsulating contaminated materials both inground and within two above ground containment bunds. One containment structure is located on the western boundary of the FFH site and the other is located on Talley's wider property (to the south outside the proposed plan change area). The works were undertaken under the following resource consents:

- LUC22/0101 granted by ADC; and
- CRC232138 and CRC232139 granted by ECan.

¹¹ WWLA, September 2022. Fairfield Freight Hub, Ashburton. Remediation Action and Site Management Plan (Ground Contamination). Prepared for Talley's Ltd [ref: WWLA0655]

On completion of the works, WWLA provided a long-term management plan¹² which confirmed the actions taken during remediation of the site and provided documentation to inform its post remediation condition and the ongoing management of containment structures.

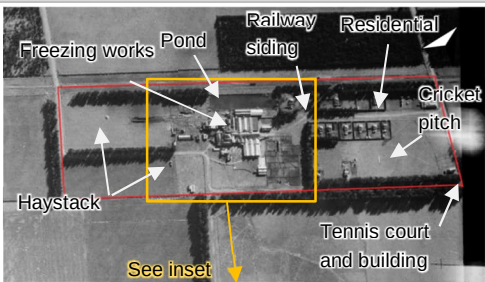
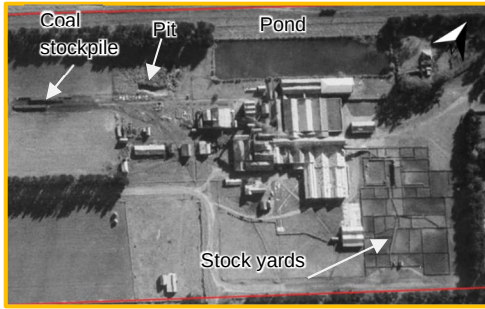
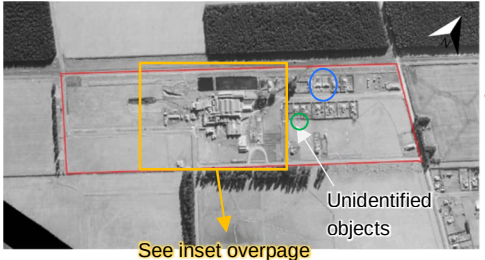
3.2.1.2 Solar Farm

Resource consent has been lodged for a proposed solar farm on the eastern portion of the site – land which is currently in pastoral use, addressed as 78 Fairfield Road West. WWLA's investigation² found that the land had residential dwellings lining Office Road, and several others in the south and west of the proposed solar farm site. A centrally located cricket pitch was also present up until the staged demolition/ removal of the dwellings between 1998 and 2023. Soil sampling found topsoil quality across the proposed solar farm site had anthropogenic influences, particularly within the footprint of the former residential areas with elevated lead compared to background. However, while contaminant concentrations exceed expected background levels, they are well below the human health criteria. Environmental criteria are only exceeded under an ongoing agricultural use scenario and therefore consent was not required under the NESCS. At the time of writing this report, construction of the solar farm had not commenced.

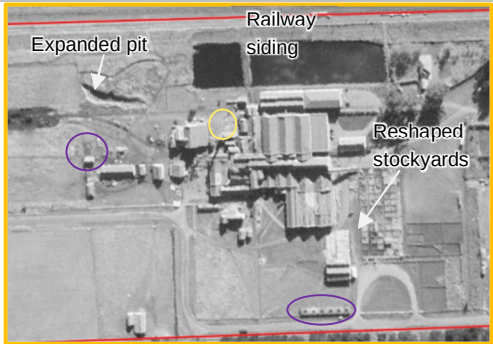
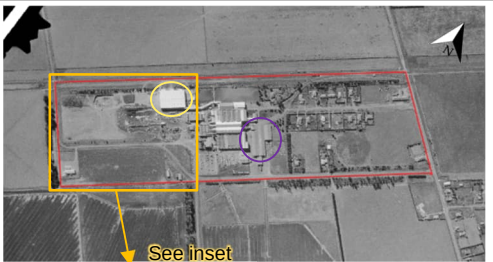
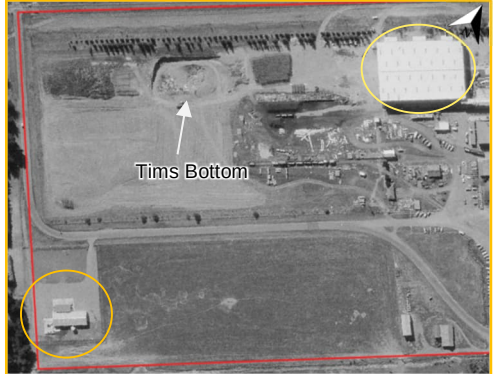
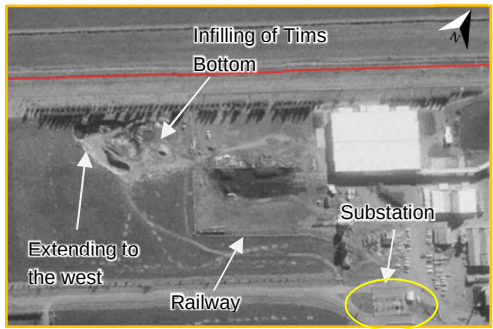
3.2.2 Aerial photograph review

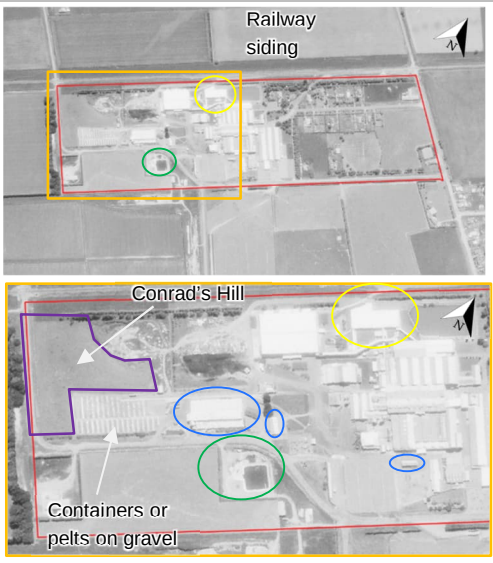
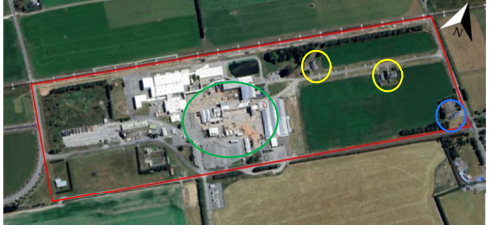
Historical aerial imagery available from Retrolens and Google Earth were reviewed and are summarised in Table 3.

Table 3. Historical aerial photograph review

Photograph date (source)	Description, relevant photographs and insets	
1942 Retrolens (SN214 360/39)	A number of residential dwellings occur on the north-eastern third of the site along with a cricket pitch and tennis court. A railway siding is seen running north-south off the main line towards the south-western area of the site. The central third has a large pond, stockyards and buildings associated with meat processing (the Fairfield Freezing Works). To the south-west of the buildings is a laydown yard/ rail siding, which has a pit and a coal stockpile. The south-western third is in pastoral use and has a small stockpile likely to be a haystack or similar. Additionally a number of shelter belts are seen within and along the boundaries of the site. The Main South Line is present to the north of the site. Adjacent land is largely in pastoral use, and Fairton township is to the east.	 
1952 Retrolens (SN804 2118/25)	Two additional buildings (circle blue) and two unidentified objects (circled green), in close proximity to storage tanks identified by ECan (refer to Section 3.2.3), are located in the eastern third of the site. Additional buildings have been constructed (circled purple) and some demolished (circled yellow), the pond has been separated in two and the stockyard has been reshaped in the central third. The pit identified in the 1942 aerial has expanded in size.	

¹² WWLA, April 2024. Fairfield Freight Hub, Ashburton, Long Term Management Plan (Ground Contamination). Prepared for Talley's Ltd [ref: WWLA0843]

Photograph date (source)	Description, relevant photographs and insets	
	Other than removal of some shelter belts no material changes are evident in the site surrounds.	
1976 Retrolens (SN2927 O/6)	The eastern third of the site remains largely unchanged, primarily under residential use. The central third has had a portion of the stockyard removed and has a been replaced with a large building (circled purple). The pit area described in the 1942 and 1952 aerial photographs has been covered by a building (circled yellow). Gravel extraction is underway in the area referred to as "Tim's Bottom", in the western portion of the site. Stockpiles/windrows of soil/gravel are present to the west of Tim's Bottom, and there is evidence of more widespread surficial earthworks across this area. Coal storage and transport continues to occupy the south-eastern corner of the site, with several rail cars evident. A new farm/ shed has been constructed in the southern corner (circled orange). Some intensification is evident in Fairton township and its immediate surrounds.	 See inset  Tim's Bottom
1981 Retrolens (SN5917 G/17)	The eastern and central third of the site remain largely unchanged except for extensions to existing buildings (circled green) and development of a substation (circled yellow). Further gravel extraction, extending westward, and filling of Tim's Bottom is evident in the western portion of the site. Coal stockpiles remain present to the east of Tim's Bottom. Surrounding land remains largely unchanged and in pastoral use.	 See inset  Infilling of Tims Bottom Substation Extending to the west Railway Inset 3: Zoomed in view of the south-western third of the site in 1981.

Photograph date (source)	Description, relevant photographs and insets	
1987 Retrolens (SN8777 B/23)	The eastern portion of the site remains largely unchanged. Some changes are noted in the central and south-western thirds of the site, including: - The southern portion of pond initially noted in the 1942 aerial has been infilled and a building and associated structures constructed (circled yellow). - A new pond and associated access roads have been constructed to the south of the main freezing works (circled green). - Filling of Tim's Bottom is ongoing, a cut face can still be seen along the northern margin of the pit. Vehicle tracks through/over the pit area indicate considerable vehicle traffic. - A gravel pad is noted and a number of containers or pelt bundles are stored throughout the gravel pad area. Ground conditions bordering the gravel pad are suggestive of a contour change, indicating "Conrad's Hill" has been formed to some extent (purple outlined area). - Additional buildings are noted as outlined in blue.	
1998 Retrolens (SN12542 A/19)	Image resolution is poor, however the only significant changes noted are: - The removal of a building in the northern corner (circle yellow); and - Tim's Bottom appears to have been filled, with trafficking across the area leading to the west, indicating potential placement of further fill (i.e – the northwest corner of Conrad's Hill).	
2007 Google Earth	Changes to the site are minor, with a residential building in the eastern portion having been demolished/ removed (circled yellow) and new/ additions to existing buildings (circled blue). Additional debris are evident across the ground surface throughout the Tim's Bottom area. No material changes are evident in the site surrounds.	
2023 Google Earth	The majority of the residential buildings in the eastern portion of the site have been removed, and the area is grassed with only three residential buildings (circled yellow) and the hall (circled blue) remaining. Multiple buildings associated with the freezing works have been demolished (circled green). A new substation was developed immediately to the south of the site, with the substation within the site removed, circa 2020/2021. Jb Cullen Drive was developed to the west of the site circa 2010.	

3.2.3 Listed Land Use Register (LLUR)

ECan has a publicly available map of the sites where hazardous activities and industries have been located throughout Canterbury. Below is a summary of the LLUR information ECan hold, with locations of the HAILS shown in **Figure 4**. The full ECan LLUR reports are provided in **Appendix A**.

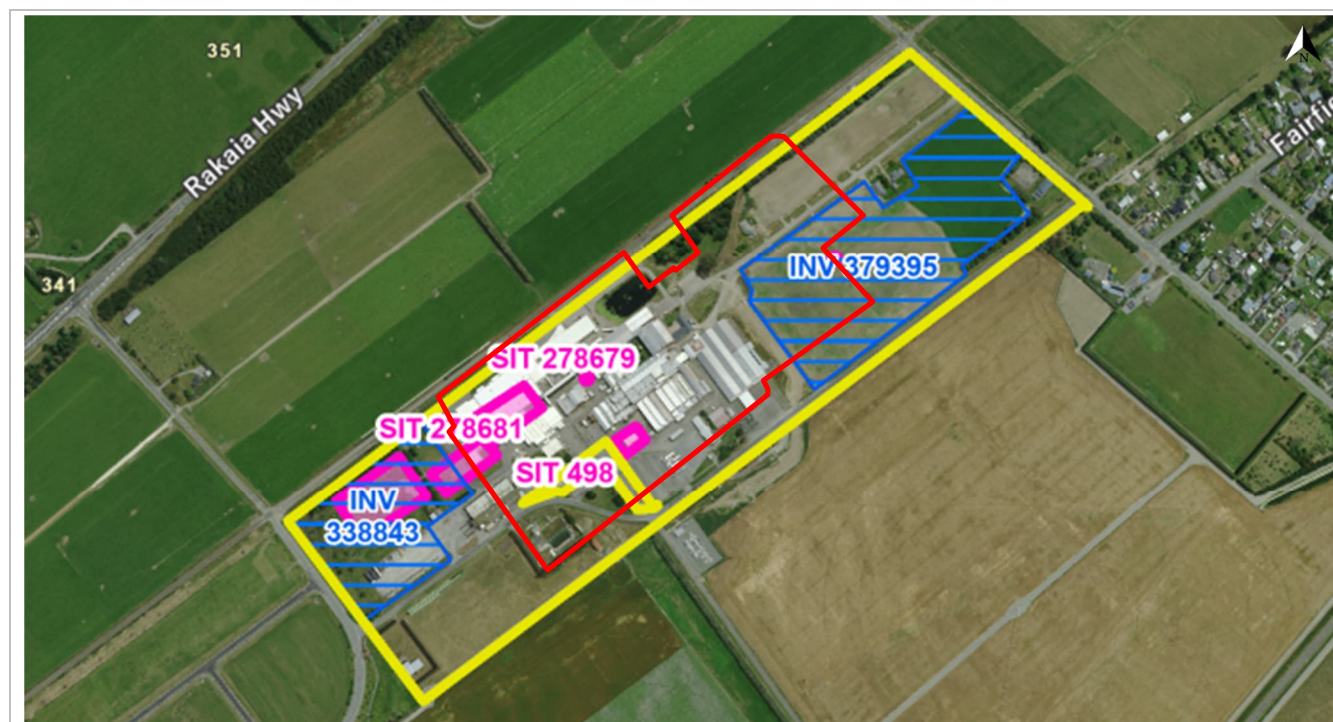


Figure 4. HAIL activities recorded by ECan

Site 498: Includes HAIL activities A17: Storage tanks or drums for fuel, chemicals or liquid waste and E5: Coal or coke yards with periods ranging from 1972 (possibly 1959) to present.

Site 278679: Includes HAIL activities G3: Landfill sites with periods ranging from 1941 to 1961.

Site 278681: Includes HAIL activities G3: Landfill sites with periods ranging from 1981 to post 1995.

INV 338843: Investigation for Fairfield Freight Hub, Site Clearance Works Preliminary and Detailed Site Investigation Ground Contamination. ECan notes it has received the document, however they have not yet summarised the findings.

INV 379395: Investigation for 78 Fairfield Road West and 125 Fairfield Road, Fairton Ashurton Preliminary and Detailed Site Investigation Ground Contamination. ECan notes it has received the document, however have not yet summarised the findings.

3.2.4 Property file

The ADC property file was received on 20 August 2024. **Table 4** provides a summary of the key information related to ground contamination and historical use of the site. Key site features related to contamination are shown on **Figure 3**. A list of building consents provided by ADC is included as **Appendix B**.

Table 4. Relevant property file information

1950s to 1980s	Various building applications and building plans prepared for Canterbury Frozen Meat Co Ltd to erect a boiler house, alter inspectors amenities, shepherds amenities, main office, reconstruct coolstore interior, extend & roof over sheep yards, woolshed, a haybarn, a garage and dwellings. Various plans show site features including: - Existing coolstores and railway; - The layout of the slaughterboard and offal department; - A boiler house located south of a wool and pelts warehouse; - A pallet store; - A proposed cold store adjacent to 2 lakes, pump house, tank and located south of the main trunk line;
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	- The location of a substation; - Plans for a proposed cricket pavillion; and - Plans for varioys dwellings include references to 'lead edged ridging' in the roof, 'fibrous plaster' in the ceiling and 'asbestos cement' in the soffits.
1980s to 2000s	Various building consent applications and associated reports and plans for Primary Producers Co-Op society Ltd for the installation of a chiller, demolishing a dwelling, old freezer block and constructing a meat processing block, new lamb cutting amenities block, extending an implement shed, coldstore and alterations to freezers.
2000s to 2020s	Various building records for for Silver Fern Farms Sheepmeat Ltd relating to the installation of tanks, erection of a workshop, new destillage area, carton chiller, alteration of lambcutting blocks, pelt pond, construction of a link corridor at coldstore block, mezzanine floor in pelt house, wastewater disposal system, extention of fellmongery and reroofing part of existing mutton slaughterboard.

3.2.5 Client provided information

Talley's store small quantities of hazardous substances for use in its current operations. The current register of hazardous substances is provided in **Appendix C**. As shown, with few exceptions the quantities stored are less than 100 litres, and principally comprise cleaning products and small volumes of fuel and agrichemicals. Of the products stored in larger quantities they all have either low mobility (Rubia Works 4000 is an engine oil for earthmoving equipment) or are not expected to be persistent in the environment (ammonia gas and grape wash, which is a biodegradable detergent).

3.2.6 Other information

Online searches identify that the site was occupied by the Fairfield Freezing Works, which opened circa 1900. It is reported in The Cyclopedia of New Zealand¹³ that *"the works put through 500 sheep in a day, and had a storage capacity for 80,000 carcasses... Although freezing carcasses is the main business of the works, other industries are carried on in connection with the wool, hides, and tallow, the manufacture of by-products, such as premier jus, tallow, manure, and sausage casings". "At its peak, the plant was a three-chain sheep meat operation employing more than 700 staff"*¹⁴.

The local council is reported¹⁵ as developing an *"...ingenious system of water races able to supply the more than 3,000 litres of water per minute required to ensure the enterprise could function"*. It is also reported¹⁶ that *"At the time waste products from most freezing works was discharged into nearby rivers or the sea. In the case of Fairfield there was no nearby body of water that could allow this practice to happen. Instead, the company purchased a large property with the intention of giving an object lesson to other farmers and companies on both the value of irrigation and the utilisation of waste products as fertiliser"*.

Fairfield Freezing Works was originally owned by the Canterbury Frozen Meat and Dairy Produce Export Company with ownership changing to the Primary Producers Co-operative Society and later Silver Fern Farms. In the face of declining sheep numbers Silver Fern Farms closed the sheep meat processing plant in 2017 and the pelt processing plant in 2019. Talley's took the site over from Silver Fern Farms in 2020.

3.3 Potential for Contamination

Potentially contaminating activities are described in **Table 5** (overpage) along with an assessment of the likelihood and magnitude of any contamination resulting from the activity, and whether the activity constitutes a HAIL. Those activities highlighted **red** are confirmed HAILS and those activities that have potential to have occurred but require soil testing to confirm are highlighted in **orange**. Those in **green** are not a HAIL in the context of this site.

¹³ <https://ndhadeliver.natlib.govt.nz/webarchive/20201108000000/https://nzetc.victoria.ac.nz/tm/scholarly/tei-Cyc03Cycl-t1-body1-d6-d60-d4.html>

¹⁴ <https://www.1news.co.nz/2024/04/19/abandoned-freezing-works-making-a-comeback/>

¹⁵ <https://www.guardianonline.co.nz/news/from-tussock-to-transport-hub/>

¹⁶ <https://www.facebook.com/groups/4034626889927412/posts/the-early-days-of-fairfield-freezing-works-and-fairton-township-by-michael-hanrah/7229628310427238/>

Table 5. Evaluation of potentially contaminating activities from previous and current land use

Land use and associated HAIL Activity	Potential contaminants	Potential likelihood and extent of contamination	HAIL Assessment
Storage and drying of processed animal pelts <i>HAIL Activity A16: Skin or wool processing including a tannery or fellmongery, or any other commercial facility for hide curing, drying, scouring or finishing or storing wool or leather products</i>	Metals, acids, sulfides, cyanides and formaldehyde	Testing undertaken in relation to the FFH showed the gravel surface has elevated metals, possibly due to the storage and drying of processed pelts. However, this area has been redeveloped and capped. Residual contamination from this activity may remain in the vicinity of the pelt house, ponds (wastewater treatment) and slinky (skin) shed.	HAIL Activity A16 <u>does apply</u> to parts of the site, principally the western portion.
Dangerous goods storage <i>HAIL Activity A17 (Storage tanks or drums for fuel, chemical or liquid waste)</i>	It is expected that a wide variety of dangerous goods were historically stored on site, possibly including metals, acids, sulfides, cyanides, formaldehyde, hydrocarbons (fuel, oil grease)	Property files identify an 'engine room' and an area known as 'trades', which likely stored dangerous goods such as oils and greases (as a minimum). Additionally, while the freezing works boilers were originally coal fired, coal use ceased circa 1987 and it is likely the boilers were diesel fired from that time. As indicated above, a range of dangerous goods would also have been stored for use in pelt processing. If present, contamination is most likely be confined to shallow soils given the low mobility or limited persistence of the majority of the chemicals. If present larger spills, such as of hydrocarbons, would be expected to be readily identifiable during future groundworks. Dangerous goods / hazardous substances are also stored and used as part of Talley's current operations. However, as these are stored and used in accordance with current standards, and generally in only small quantities, there is limited potential for ground contamination to arise from this activity.	HAIL Activity A17 <u>does apply</u> to the main freezing works and pelt processing areas, principally the central portion of the site.
Former substation <i>HAIL Activity B4 (Substation)</i>	Hydrocarbons (oils), poly-carbonated biphenyls (PCBs), metals	A substation, constructed sometime between 1976 and 1981, was previously located within the site until it was decommissioned circa 2020/2021. As the use of use of dielectric fluids that contain PCBs have been phased out since the 1980s it is unlikely that the substation included significant quantities of these contaminants. However, oils may still have been lost to ground during operation and maintenance of the substation. If present, contamination would likely be confined to shallow soils.	HAIL Activity B4 <u>does apply</u> to the former substation.
Coal storage <i>HAIL Activity E5 (Coal and coke yards)</i>	Polycyclic aromatic hydrocarbons (PAHs) and metals (coal can contain naturally occurring metals, distinct to its origin, i.e. arsenic and boron predominantly), sulphur compounds	Impacts that may in part be related to coal storage were identified during investigation of the FFH. While, this area has been redeveloped and capped, it is possible that other localised areas may also be affected, for example around the rail siding / unloading areas and boiler house. If present, contamination would likely be confined to shallow soils.	HAIL Activity E5 <u>does apply</u> to the FFH and associated containment bunds. Other localised areas may also be affected (e.g. around the boiler house)

Land use and associated HAIL Activity	Potential contaminants	Potential likelihood and extent of contamination	HAIL Assessment
Railway sidings <i>HAIL Activity F6 (Railway yards)</i>	Hydrocarbons, metals and asbestos	Railway sidings have historically operated on the site. However, this category is intended to cover activities that take place on railway sites that may result in ground contamination that are not expressly covered by other HAIL categories. The types of contaminants and activities expected to have been undertaken in relation to the rail sidings (primarily receiving coal and livestock and despatching processed meat products) are covered by other categories in this instance.	HAIL Activity F6 does not apply as the activity is covered by other categories
Asbestos use <i>HAIL Activity E.1. Asbestos... including sites with buildings containing asbestos products known to be in a deteriorated condition</i>	Asbestos	While many of the freezing works buildings were constructed prior to asbestos being in common use, asbestos containing materials (ACM) are likely to have been added during the various extensions and upgrades of the facilities. Asbestos is indicated to have been included in some of the residential dwellings (now demolished). Degradation of ACM, certain property maintenance activities (water blasting, painting prep/sanding) and demolition of these buildings have the potential to deposit asbestos fibres to surficial soils around building margins and/or areas of stormwater flow and collection. Previous testing at the FFH and proposed solar farm did not identify asbestos in soil, however parts of the site have not been tested.	HAIL Activity E1 may apply to the site if asbestos is present in soils.
Placement of uncontrolled fill, including demolition wastes and boiler ash. Possible disposal of other wastes, e.g. offal pits <i>HAIL Activity I (as above) or G5 Waste disposal to land</i>	A range of contaminants, depending on the source. Typical contaminants include asbestos, PAH's and metals	ECan's LLUR notes two discrete areas where landfilling has occurred. As noted on the historical aerial review a former gravel pit was located in the northeast corner of the site. An additional pit (Tim's bottom) was infilled but recently remediated as part of the FFH works. There is potential for the pits to have been backfilled with wastes. If present the wastes are expected to be confined to the former pits.	HAIL Activity I or G5 applies to the FFH and may apply to the wider site if former gravel pits has been filled with waste materials
Sports turfs <i>Activity A10. Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds.</i>	Arsenic, lead, copper; pesticides, particularly organochlorine pesticides (OCPs) prior to 1990s.	A cricket pitch was located on the eastern portion of the property from at least 1952. Pesticide spray use for the maintenance of sporting turfs in that time period typically included persistent pesticides such as metals and OCPs. Testing undertaken for the proposed solar farm identified that pesticide residues are present in surficial soils (topsoil).	HAIL Activity A10 applies to the cricket oval as previous testing confirms elevated metals.
Use of lead-based paint. <i>HAIL Activity I. Intentional or accidental release of a hazardous substance in sufficient quantity that could pose a risk to human health of the environment.</i>	Lead and other metals	The age of both the former freezing works and residential buildings means use of lead-based paints is likely. In the same way as asbestos, maintenance or degradation of lead-based paint, has the potential to deposit lead to surficial soils around building margins and/or areas of stormwater flow and collection. Previous testing undertaken in relation to the FFH and proposed solar farm shows elevated lead in soil, however below human health and environmental criteria and thus the potential risk is considered to be low. But as noted above parts of the site have not been tested.	HAIL Activity I may apply to the site if contaminants are above concentrations that pose a risk to human health or the environment.

4. Soil Characterisation

Soil sampling was undertaken on 5 and 6 August 2024 by a SQEP from WWLA. The following provides the rationale, method and results of soil sampling and testing.

4.1 Sampling and analysis rationale

As presented in the preceding sections, WWLA has previously completed ground investigations in parts of the site (FFH and proposed solar farm). To inform the plan change process additional soil sampling was undertaken in readily accessible areas to understand the potential for ground contamination in areas not previously tested. Soil samples were collected from 16 additional locations (see **Figure 5**) on the following basis:

Activity	Sampling locations	Analyses
Former residential area (northeastern portion of the site)	TP9 to TP11	Asbestos, metals, PAHs
Adjacent to the remaining "lake"	TP12	Asbestos, metals, PAHs
Former freezing works area	TP01, TP02, TP13 to TP18	Asbestos, metals, PAHs TPH was included at TP01 and TP18 to assess gross impacts from the former substation OCPs were included at TP13 to assess potential impacts from the adjoining pastoral area
Former pelt pond / wastewater treatment area	TP19 and TP20	Asbestos, metals, PAHs OCPs were included at TP20 to assess potential inclusion of these compounds in wastewater produced at the site
Former burning area	TP21	Asbestos, metals, PAHs, OCPs OCPs were included assess potential impacts from pastoral use
Former slinky (skin) shed	TP22	Asbestos, metals, PAHs

As described in **Section 1.1**, the sampling undertaken for this assessment is not intended to fulfil the requirement for a DSI and further targeted sampling maybe required to support future development in areas of the site that have not been tested to date.

4.2 Sampling methodology and data quality

The soil sampling and data quality methodologies are summarised below:

Sampling method	Soil sampling was undertaken by a SQEP from WWLA with samples collected directly from the excavator bucket. Soil sampling was undertaken in general accordance with CLMG5 as follows: - Collection of samples using freshly gloved hands, directly from excavator bucket and placed into laboratory supplied containers. - Couriering samples chilled, under chain of custody documentation. - All samples were sent to an IANZ accredited laboratory for testing.
Data quality	The data quality objectives (DQOs) for this investigation were to: - Undertake the investigation in general accordance with the sampling and analysis plan; and - Collect and analyse soil samples and with sufficient accuracy and precision to provide evaluation against relevant human health and environmental acceptance criteria. The following quality assurance and quality control measures were implemented to meet the investigation DQOs: - Appropriately experienced staff were used to undertake the field investigation work.

- Sampling was undertaken in accordance with methodologies recommended in national guideline documents.
- Appropriate chain of custody documentation was used.
- Soil analyses were carried out by International Accreditation New Zealand (IANZ) accredited laboratories using industry standard methods.

4.3 Field observation of soil conditions

The following observations were made during the intrusive investigations. Selected photographs are provided below and test pit logs are provided in **Appendix D**:

- The stratigraphy encountered across the site is summarised as follows:
 - **Topsoil**: where present (all locations except TP14 to TP16) was generally up to 0.3 m thick and consisted of medium to light brown gravelly SILT, dry, firm and non-plastic with trace rootlets (**Photograph 6**). Demolition material, comprising brick and concrete fragments, was observed to be included in the topsoil at TP11 (**Photograph 7**).
 - **Fill**: three primary fill types were encountered as follows:
 - Gravel fill including minor amounts of brick, glass, concrete and ceramic fragments was encountered in TP9 to TP11 (**Photograph 8**), in the vicinity of the former residential dwellings. An asbestos fragment (F1) was encountered at 0.5 mBGL in TP9 (**Photograph 8**).
 - Demolition fill, generally less than 0.5m in thickness, was encountered in TP14 to TP16, where the previous freezing works plant had been demolished. This consisted of a sandy gravel containing brick, concrete and timber (**Photograph 9**). Fill extended up to 2.1 mBGL at TP12 with reinforced concrete blocks, brick fragments, timber and plastic present at this location (**Photograph 10**).
 - Boiler ash or coal residue, extending up to 0.5m BGL, was encountered at TP18, adjacent to the main freezing works plant area. This consisted of dark grey/ black, sandy silty gravel with a minor organic odour (**Photograph 11**).
 - **Natural soils**: were encountered at all locations except TP15 (which was abandoned due to a potential service). These comprised sandy fine to medium GRAVELS. Gravel was orange-brown, sub-rounded to rounded greywacke. Sand was fine to coarse.
- With the exception of fill materials (described above), no visual or olfactory evidence of contamination was noted. This included no observations odours or discolouration.
- Groundwater was not encountered in any of the investigation locations.



Photograph 6. View of TP2 showing typical topsoil



Photograph 7. View of TP11 showing topsoil with included debris



Photograph 8. View of ACM fragments encountered at TP9



Photograph 9. View of TP16 showing demolition fill underlying the former trades building



Photograph 10. View of TP12 showing reinforced concrete



Photograph 11. View of TP18 showing boiler ash layer

4.4 Analytical results

The laboratory data is summarised in **Table 6**, sampling location are shown on **Figure 5**, and full laboratory transcripts are provided in **Appendix E**. The analytical data was compared against the criteria set out below:

Protection of Human Health	NESCS SCS^{17,18} for commercial / industrial land use as a proxy for assessing potential exposures to daily workers. Human health soil guideline values for asbestos set out in the BRANZ Guidelines¹⁹.
Discharges to the Environment	In the absence of a National Environmental Standard or ECan-derived values for assessing contamination effects on the environment, the Canadian Soil Quality Guidelines (CCME) "commercial" land use values have been used to assess potential environmental effects, as prescribed by CLMG2. A commercial land use has been adopted as the land will be rezoned for this use. We note that the CCME values are often not reflective of New Zealand geological conditions and are therefore not always valid Tier 1 screening criteria. We have therefore also assessed against the Ecological Soil Guideline

¹⁷ Soil Contaminant Standards (SCS) as set out in Ministry for the Environment, 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.

¹⁸ Where NESCS are not provided, guidelines have been adopted in accordance with Ministry for the Environment, 2011. Contaminated Land Management Guidelines No. 2, Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011). Wellington: Ministry for the Environment.

¹⁹ BRANZ, 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil. Wellington: Building Research Association of New Zealand.

	Values ²⁰ (Eco-SGVs; for commercial/ industrial use). There is potential for these guidelines to be incorporated into a National Standard in the future.
Soil Disposal	Published background concentrations have been adopted from ECan Reports: - No. R07/1 "<i>Background concentrations of selected trace elements in Canterbury soils</i>" prepared for Environment Canterbury by Tonkin and Taylor Ltd, July 2006²¹; and - R07/19 "Background Concentrations of polycyclic aromatic hydrocarbons in Christchurch urban soils" prepared for Environment Canterbury by Tonkin and Taylor Ltd, July 2007. These values are typically used as a basis for acceptance of soil to cleanfill sites. Background values are also considered when assessing the activity status of the NESCS for soil disturbance and removal.

The analytical results are summarised as follows:

Surficial materials (topsoil and fill)	- Typically one or more metals (generally lead and zinc) are present above expected background concentrations in most topsoil and fill sampled. The highest concentrations are present in the vicinity of former residential dwellings and around the main plant area. This contamination most likely derives from maintenance and subsequent demolition of the historic buildings. - Trace concentrations of PAHs were also commonly detected in topsoil. However, with the exception of the sample collected from TP13 (within the former rail siding on the eastern edge of the main plant area), PAH concentrations were within expected background ranges for urban soils. - Heavy end (C15+ carbon chain) TPH was detected in both samples tested for TPH. However, preliminary screening of the PAH ratios for these samples suggests the TPH is more likely to derive from a pyrogenic (combustion of wood or coal) rather than petrochemical (fuel hydrocarbon) sources. - Low concentrations of OCPs (DDT) were reported in two of the three topsoil samples tested for these analytes. - Asbestos was not detected in any of the topsoil samples tested. However, asbestos is present as both fibres and fragments (only a single fragments "F1" was identified at TP9) in fill materials present in the vicinity of former residential dwellings and around the main plant area. In summary, the results obtained from these investigations are similar to the findings of the assessments of the FFH and proposed solar farm.
Natural soils	All natural soils tested returned concentrations of metals and PAHs either within expected background ranges or below the laboratory limit of reporting.
Health risks	Only the concentrations of asbestos exceed the relevant guidelines for the protection of human health under a commercial / industrial land use. However, in two of the three instances the asbestos contamination is present at depth, being covered by topsoil. In addition, of the four locations sampled in the footprint of the former freezing works (TP14 to TP16), only one location returned an elevated concentration of asbestos suggesting that the contamination is likely localised. On this basis asbestos is therefore unlikely to present an unacceptable risk to health unless these areas are disturbed by future excavation works.
Environmental risks	- Only the concentrations of zinc in a few samples collected from the vicinity of former residential dwellings and around the main plant area exceed the Eco-SGVs. However, considered in the context of the wider site, distance to sensitive environmental receptors, and low mobility of zinc in soils, the concentrations are not considered to present an unacceptable risk to the environment. - While the concentrations of lead also commonly exceed Canadian criteria (environmental) they comply with the New Zealand derived Eco-SGVs, which we consider to be more relevant.
Disposal considerations	- As most of the topsoil and fill samples contain concentrations of one or more contaminants above expected background levels these materials are unlikely to be accepted for disposal as cleanfill. - With the exception of fill containing elevated concentrations of asbestos, materials can be reused onsite where geotechnically suitable. - Fill containing elevated concentrations of asbestos can only be reused where it will be covered by hard surfacing (asphalt, concrete or similar) or by a minimum 200 mm thickness of cleanfill (soil, gravel etc.).

²⁰ Manaaki Whenua – Landcare Research, 2019. Updated Development of soil guideline values for the protection of ecological receptors (Eco-SGVs): Technical document. Contract Report: LC2605 (updated), dated June 2019.

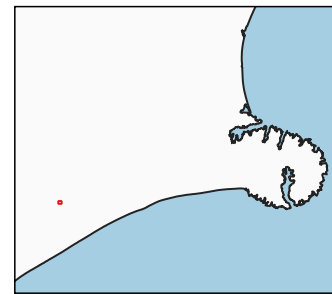
²¹ <https://opendata.canterburymaps.govt.nz/datasets/ecan::soil-trace-elements-level-2/values>



Map Title:
Sample Location Plan

Project:
 109 Works Road, Fairton
 Ashburton

Client:
Talleys Group Ltd



Legend

- Site boundary
- Sample location
 - Contaminated land investigation
 - Geotechnical investigation

Data Provenance
 Aerial imagery and land parcels from Land Information New Zealand

Drawn by: Cherise Martin
 29/08/2024

Layout Name
 Sample location Plan G:\Shared drives\Projects\Talleys Group Ltd\WWLA1240_Fairfield Private Plan Change\Technical\GIS\GIS Project Files\109 Works Road.gxd

Table 6. Summary soil analytical results

Sample information	Sample number	TP1	TP2	TP9			TP10	TP11	TP12		TP13	TP14	TP15	TP16			TP17		TP18	TP19		TP20	TP21		TP22	Human Health: NESCS (Commercial/ Outdoor worker) ¹	Environmental: Canadian soil quality guidelines (Commercial) ²	Enviromental: Ecological Soil Guideline Values (Commercial/ Industriall) ³	Background ⁴
	Depth (m bgl)	0.1	0.1	0.1	0.5	0.7	0.1	0.1	0.1	0.8	0.1	0.1	0.1	0	0.5	1.5	0.1	0.35	0.4	0.1	1.3	0.1	0.1	1.2	0.1				
	Material type	Topsoil	Topsoil	Topsoil	Fill	Natural	Topsoil	Topsoil	Topsoil	Fill	Topsoil	Fill	Fill	Fill	Fill	Natural	Topsoil	Fill	Fill	Topsoil	Natural	Topsoil	Topsoil	Natural	Topsoil				
Asbestos	ACM (>10 mm)	Not detected	-	-	<0.001	-	Not detected	Not detected	Not detected	<0.001	-	<0.001	<0.001	Not detected	Not detected	-	Not detected	-	Not detected	-	-	-	Not detected	-	Not detected	0.05% ⁵	-	-	-
	AF/FA (2-10 mm)				0.043					0.007		<0.001	0.113																
	AF/FA (<2 mm)																												
Metals	Arsenic	5	8	6	-	6	12	17	6	12	4	6	6	6	-	4	-	5	10	3	5	5	6	5	4	70	12	71	10
	Cadmium	0.06	0.04	0.2	-	0.03	0.2	0.6	0.08	0.1	1.4	0.05	0.4	0.2	-	0.03	-	0.04	0.09	0.05	0.03	0.07	0.1	0.03	0.09	1,300	22	40	0.33
	Chromium	18	18	19	-	22	18	26	20	21	17	20	31	28	-	19	-	20	17	25	19	21	19	18	17	6,300	87	654	57
	Copper	9	8	17	-	9	15	47	10	19	17	12	18	27	-	11	-	7	61	9	12	14	10	12	11	>10,000	91	350	48
	Lead	38	25	147	-	22	100	1,660	40	88	101	34	211	264	-	18	-	29	314	17	18	27	21	17	25	3,300	260	2,548	26
	Nickel	11	13	13	-	16	12	14	13	15	11	14	14	15	-	16	-	14	16	13	16	15	12	16	12	6,000 ⁶	50	-	35
	Zinc	78	80	164	-	85	278	1,030	98	135	2,550	121	865	231	-	50	-	113	133	66	51	145	82	50	74	400,000 ⁶	360	487	100
PAHs	1-Methylnaphthalene	0.02	<0.010	0.04	-	<0.010	<0.010	0.02	<0.010	0.06	<0.010	<0.010	<0.010	<0.010	-	<0.010	-	0.03	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-
	2-Methylnaphthalene	0.02	<0.010	0.04	-	<0.010	0.01	0.02	0.01	0.06	0.02	<0.010	<0.010	0.01	-	<0.010	-	0.03	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-
	Acenaphthene	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	-	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	0.055
	Acenaphthylene	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.6	<0.010	<0.010	<0.010	-	<0.010	-	<0.010	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	0.069
	Anthracene	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.5	<0.010	<0.010	0.02	-	<0.010	-	<0.010	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	0.113
	Benzo[a]anthracene	<0.020	<0.020	<0.020	-	<0.020	<0.020	0.02	<0.020	0.03	0.2	<0.020	<0.020	0.08	-	<0.020	-	<0.020	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	10	-	0.470
	Benzo[a]pyrene	0.02	<0.010	<0.010	-	<0.010	0.01	0.03	0.02	0.03	0.3	0.02	0.03	0.10	-	<0.010	-	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	0.7	47	0.595
	Benzo[b]fluoranthene	0.03	<0.020	<0.020	-	<0.020	0.02	0.04	0.03	0.05	1	0.02	0.04	0.12	-	<0.020	-	<0.020	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	10	-	0.947
	Benzo[g,h,i]perylene	<0.020	<0.020	<0.020	-	<0.020	<0.020	0.03	<0.020	0.03	0.7	0.02	0.03	0.07	-	<0.020	-	<0.020	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	-	-	0.459
	Benzo[k]fluoranthene	<0.010	<0.010	<0.010	-	<0.010	<0.010	0.01	<0.010	0.02	0.2	<0.010	<0.010	0.04	-	<0.010	-	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	10	-	0.296
	Chrysene	0.03	<0.010	0.02	-	<0.010	0.02	0.03	0.02	0.05	0.6	0.02	0.08	0.1	-	<0.010	-	<0.010	0.1	<0.010	<0.010	0.019	<0.010	<0.010	<0.010	-	-	-	0.539
	Dibenz[a,h]anthracene	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.2	<0.010	<0.010	0.02	-	<0.010	-	<0.010	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	10	-	0.112
	Fluoranthene	0.03	<0.020	<0.020	-	<0.020	0.02	0.05	0.03	0.04	0.4	<0.020	<0.020	0.2	-	<0.020	-	<0.020	0.13	<0.020	<0.020	0.03	<0.020	<0.020	<0.020	-	-	-	1.345
	Fluorene	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	190	0.060
	Indeno(1,2,3-cd)pyrene	0.02	<0.010	0.01	-	<0.010	0.01	0.03	0.02	0.03	0.6	0.02	0.01	0.07	-	<0.010	-	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	10	-	0.385
	Naphthalene	0.01	<0.010	0.02	-	<0.010	<0.010	0.01	<0.010	0.03	0.01	<0.010	<0.010	<0.010	-	<0.010	-	<0.010	0.07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	210 ⁷	22	-	0.029
	Phenanthrene	0.03	0.01	0.03	-	<0.010	0.01	0.03	0.02	0.06	0.08	<0.010	<0.010	0.09	-	<0.010	-	0.023	0.1	<0.010	<0.010	0.013	0.02	<0.010	<0.010	-	50	-	0.7
	Pyrene	0.03	<0.020	<0.020	-	<0.020	0.02	0.05	0.03	0.06	0.7	0.02	0.04	0.2	-	<0.020	-	<0.020	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	>10,000 ⁷	100	-	1.362
	Benzo[a]pyrene TEQ (LOR)	0.03	<0.03	<0.03	-	<0.03	0.03	0.05	0.04	0.06	0.7	0.04	0.05	0.2	-	<0.03	-	<0.03	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	35	-	-	0.922
OCPs	4,4'-DDE	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	<0.010	0.099	-	-	-	-	-	-
	4,4'-DDT	-	-	-	-	-	-	-	-	-	<0.010	-	-	-	-	-	-	-	-	-	-	<0.010	0.015	-	-	-	-	-	-
	Total DDT	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	<0.0200	0.11	-	-	1,000	0.7	32	-
TPH	C7-C9	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	500 ⁷	-	170	-
	C10-C14	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<15	-	-	-	-	-	-	-	510 ⁷	-	140	-
	C15-C36	117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	-	-	-	-	-	-	-	>20,000 ⁷	-	1,700	-

Notes:
Results in mg/kg except where indicated (for asbestos)
For ease of reading results are rounded to the nearest whole number or 1 significant figure, refer to laboratory report for unrounded data
Grey values at background levels, Black exceed published background
1. National Environmental Standard - Soil Contamination Standard - Commercial/ outdoor worker land use
2. Canadian Soil Quality Guidelines (CCME), Update 7.0, 2007, accessed August 2024
3. Manaaki Whenua – Landcare Research, 2019. Updated Development of soil guideline values for the protection of ecological receptors (Eco-SGVs): Technical document. Contract Report: LC2605 (updated), dated June 2019.
4. Report No. R07/1 "Background concentrations of selected trace elements in Canterbury soils" prepared for Environment Canterbury by Tonkin and Taylor Ltd, July 2006
Report No. R07/19 "Background Concentrations of polycyclic aromatic hydrocarbons in Christchurch urban soils" prepared for Environment Canterbury by Tonkin and Taylor Ltd, July 2007
5. BRANZ, New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017
6. NEPM National Environmental Standard (Australia) - Soil Contamination Standard - Commercial/ industrial land use
7. Guidelines for Assessing and Managing Petroleum hydrocarbon Contaminated Sites in New Zealand, Tier 1 Soil acceptance criteria, sandy silt, surface contamination, all pathways

5. Preliminary Conceptual Site Model

A conceptual site model (CSM) indicates known and potential sources of contamination, routes of exposure (pathways), and the receptors that are affected by contaminants moving along those pathways. This is discussed in the source – pathway – receptor analysis (CSM) in **Table 7**. Receptors may be people or the environment.

The CSM's purpose is to set out risks to people and the environment (if any) associated with proposed activities on the land. In this case the current proposal is only to rezone the land, no redevelopment or ground works are currently proposed. While for completeness the CSM considers future ground works, only the source – pathway – receptor relationships **outlined in red** are relevant to the proposed plan change. In summary no unacceptable risks are indicated in the context of the proposed plan change. However, if disturbance or redevelopment of the site is proposed, then further testing will likely be required to better quantify development specific contamination risks and earthworks management requirements.

Colour coding is used in the CSM (**Table 7**) to indicate:

- **Acceptable risk**: there is no risk to human or environmental receptors; and
- **Potentially unacceptable risk**: there may be a risk to people and/or the environment if appropriate controls or remedial actions in respect of ground contamination are not in place.

Table 7. Preliminary CSM for the site

Source	Receptor	Exposure pathway	Acceptable risk (Yes/No) and assessment
Asbestos in topsoil and fill in the vicinity of former residential dwellings and the main freezing works plant area	Construction workers	Inhalation of dust	No Controls will need to be implemented by way of a Site Management Plan (SMP) to protect worker health if redevelopment of the site is proposed.
	Future site users	Inhalation of dust	Yes As described in Section 4.4 , elevated concentrations of asbestos appear to be localised and/or covered. On this basis asbestos is unlikely to present an unacceptable risk to health unless these areas are disturbed by future excavation works.
	Ecological receptors	Discharges via surface and groundwater	Yes Asbestos is not expected to have significant mobility in ground and standard stormwater controls should mitigate discharges via surface water.
	Receptors at soil receiving sites	Discharges to the receiving environment	No Potential risks associated with offsite disposal need to be managed through appropriate soil management implemented by way of a SMP.
Metals, PAHs and occasional OCPs in topsoil and fill	Construction workers	Dermal contact Inhalation of dust Ingestion of soil	Yes Contaminant concentrations are below applicable human health criteria so do not pose an unacceptable risk.
	Future site users	Dermal contact Inhalation of dust Ingestion of soil	Yes Contaminant concentrations are below applicable human health criteria so do not pose an unacceptable risk.
	Ecological receptors	Discharges via surface and groundwater	Yes Localised exceedances of Eco-SGVs for zinc are present at the site. However, considered in the context of the wider site, distance to sensitive environmental receptors, and low mobility of zinc in soils, the concentrations are not considered to present an unacceptable risk to the environment.

Source	Receptor	Exposure pathway	Acceptable risk (Yes/No) and assessment
Metals and PAHs in topsoil and fill	Receptors at soil receiving sites	Discharges to the receiving environment	No Potential risks associated with offsite disposal need to be managed through appropriate soil management implemented by way of a SMP.

It should be noted that maintenance / excavation workers are not considered in the above assessment. This is because the NESCS methodology¹⁷ excludes consideration of these workers on the basis that their exposure to contaminants will be managed under the Health and Safety at Work Act 2015. Exposure to asbestos is also controlled under the Health and Safety at Work (Asbestos) Regulations 2016. It is therefore unnecessary to also manage these exposures under contamination specific legislation such as the NESCS, especially in the context of the current proposal, which relates only to changing the zoning.

6. Implications

6.1 Consenting

The summary of contamination-related consent requirements is presented below and discussed in detail in the following sections. Only the rules/ regulations **outlined in red** are relevant to the proposed plan change. Colour coding is used to indicate where we consider the relevant requirements:

- **Can be met** or are not applicable.
- **Cannot be met** and therefore consent is required.

Regulatory framework	Rule / regulation	Consent required (Y/N and type)
NESCS	Permitted Activity 8(1) Removal of a fuel storage system	No – not applicable
	Permitted Activity 8(2) Soil sampling	No – not applicable
	Permitted Activity 8(3) Disturbing soil	Yes - if future earthworks exceed the permitted activity thresholds
	Permitted Activity 8(4) Subdivision and land use change	No - permitted activity requirements can be met
CLWRP	5.187	No - permitted activity requirements can be met

6.1.1 NESCS

The NESCS sets out nationally consistent planning controls appropriate to district and city councils for assessing potential human health effects related to contaminants in soil. The regulation applies to specific activities on land (including soil sampling, soil disturbance and removal, subdivision and land use change) where an activity included on the HAIL has occurred.

As described in the preceding sections, the current proposal is only to rezone the land, no redevelopment or ground works are currently proposed. Rezoning is essentially equivalent to a land use change under the NESCS. **Table 8** provides our assessment of the proposed plan change against Regulation 8(4) of the NESCS. In summary, consent should not be required for rezoning / land use change under the NESCS.

Table 8. Assessment against permitted activity provisions for subdivision and land use change under NESCS Regulation 8(4)

Rule 8(4)	Permitted activity requirement	Summary
(a)	A preliminary site investigation of the piece of land must exist.	This report fulfils this requirement.
(b)	The report on the PSI must state that the soil contamination is highly unlikely to present a risk to human health if the activity is done to the piece of land.	Can be met, this assessment identifies that while contaminants are present in localised areas they are highly unlikely to present a risk to human health under the current use of the site. However, the requirement for consent will need to be evaluated if disturbance and/or redevelopment of the site is proposed.
(c)	The report must be accompanied by a relevant site plan to which the report is referenced.	The figures within this report fulfil this requirement.
(d)	The consent authority must have the report and the plan.	Can be met if this report is provided to Council.

For reference we also provide an assessment of future disturbance and/or redevelopment in **Table 9** (overpage). In summary, other than for small scale projects, consent is likely to be required under the NESCS for future disturbance and/or redevelopment of the site. As described in the preceding sections, further soil

testing will likely be required to confirm the consent activity status and to better quantify development specific contamination risks and earthworks management requirements. An SMP will also be required to support future consent applications future disturbance and/or redevelopment under the NESCS. An SMP is also recommended to support works undertaken under the permitted activity provisions.

Table 9. Assessment against permitted activity provisions for soil disturbance associated under NESCS Regulation 8(3)

Rule 8(3)	Permitted activity requirement and (<i>in italics evaluation commentary</i>)	Summary
(a)	Implementation of controls to minimise exposure of humans to mobilised contaminants.	Can be met if asbestos is managed in accordance with the NZAG / BRANZ (i.e. under the Asbestos Regulations)
(b)	The soil must be reinstated to an erosion free state within one month of completing the land disturbance.	Expected to be able to be met for most projects.
(c)	The volume of the disturbance of the piece of land must be no more than 25 m ³ per 500 m ² . <i>The permitted volume of disturbance, based on the area of the site (~321,100 m²) is 16,055 m³.</i>	Dependent on the scale of the project. Likely to be met for many projects
(d)	Soil must not be taken away unless it is for laboratory testing or, for all other purposes combined, a maximum of 5 m ³ per 500 m ² of soil may be taken away per year. <i>For this site the site-specific permitted volume for soil removal is 3,211 m³ per year.</i>	Dependent on the scale of the project. Likely to be met for many projects
(e)	Soil taken away must be disposed of at an appropriately licensed facility.	Expected to be able to be met for most projects.
(f)	The duration of land disturbance must be no longer than two months.	Dependent on the scale of the project. Unlikely to be met for most larger scale development projects.
(g)	The integrity of a structure designed to contain contaminated soil or other contaminated materials must not be compromised.	Applicable only to the FFH and associated containment bunds. Expected to be able to be met for most projects.

6.1.2 Canterbury Land and Water Regional Plan (CLWRP)

Rule 5.187 of the CLWRP relates to passive (ongoing) discharges of contaminants to land. The rule largely relates to effects on groundwater and associated discharges to surface water. The requirements of this rule are expected to be met as the contaminants of concern are expected to be bound strongly to soils and depth to groundwater and distance from site to the nearest surface water body (>3 km) means natural attenuation processes are likely to reduce any contaminant loads or other undesirables well below applicable standards prior to discharge. On this basis consent under Rule 5.187 of the CLWRP is not required (refer to **Table 10** for further detail).

Table 10. Permitted activity provisions for passive discharge of contaminants under the CLWRP Rule 5.187

Rule 5.187	Permitted activity requirement.	Evaluation
(1)	There has been a site investigation report provided to the CRC in accordance with Rule 5.185	Can be met if this report is provided to council.
(2)	Either the site investigation report or water quality sampling demonstrates that the discharge does not result in the concentration of contaminants in groundwater: (a) at the property boundary;	Can be met as limits for the contaminants of concern relating to the site is not specified in Schedule 8.

Rule 5.187	Permitted activity requirement.	Evaluation
	(b) at any existing groundwater bore (excluding any monitoring bore located on the property); (c) within a Community Drinking-water Protection Zone; exceeding the limits applicable to groundwater set out in Schedule 8.	
(3)	Either the site investigation report or water quality sampling demonstrates that the discharge does not result in the concentration of contaminants in groundwater at any point where groundwater exits to surface water, exceeding the receiving water quality standards in Schedule 5 for 90% of species.	Expected to be met – the contaminants of concern are expected to be bound strongly to soils and as described in Section 2 , groundwater beneath the site is at some 20-30 m depth. The vertical depth to groundwater and lateral distance from site to the nearest surface water body (>3 km) means natural attenuation processes are likely to reduce any contaminant loads or other undesirables well below applicable standards prior to surface discharge.
(4)	At any point where the groundwater exits to surface water the discharge does not produce any: (a) conspicuous oil or grease films, scums or foams, or floatable or suspended materials; or (b) conspicuous change in the colour or visual clarity	

6.2 Earthworks implications

Implications for future earthworks are provided below for reference only since they are not currently proposed. It is expected that these implications will be reviewed when project / development specific soil testing is undertaken prior to future earthworks occurring:

Remediation	Where it is not already covered, or is uncovered by future works, either remediation or management (covering) of fill containing elevated concentrations of asbestos will be required. In accordance with the NZAG / BRANZ guidelines management could comprise covering under hard surfacing (new pavements, building foundations/slabs) or laying geotextile (e.g. bidim) then placing a 200 mm thickness of soil won from elsewhere on the site (or other cleanfill material from offsite if required). Remediation requirements (if any) across the remainder of the site are expected to be highly localised and be able to be managed in the enabling works phase of each project / development.
Earthworks controls	Specific controls to prevent sediment discharges onto surrounding soils (e.g. temporary silt fences and dust controls) will be required to be implemented during remediation or management of fill containing elevated concentrations of asbestos. However, we anticipate standard earthworks controls, as set out in ECan's guidance documents, are applicable for the works across the wider site.
Health and safety	Aside from asbestos controls during remediation or management of fill containing elevated concentrations of asbestos, there are no specific contamination-related health and safety requirements for onsite workers during disturbance or removal of soil. However, good hygiene practices should always be followed, such as washing hands before eating and drinking, and separation of work areas and break areas. Unexpected contamination response procedures will provide health and safety requirements to ensure workers and the public are not exposed should more significant levels of contamination be uncovered.
Asbestos controls	Asbestos concentrations measured to date are typically at the "Unlicensed Asbestos Works" or "Asbestos-Related Works" levels, with "Class B" levels only detected occasionally. On this basis it is expected that ground works in the former freezing works plant demolition area are most likely to be able to be conducted under "Asbestos-Related Works" controls. These require that disposable overalls and nitrile gloves be worn, along with a disposable P2 dust mask. Water should be used to wet down surfaces being worked and basic decontamination facilities (boot wash and collection of used PPE) are appropriate. However, further testing should be undertaken to confirm the level of control prior to works commencing.
Soil reuse	With the exception of fill containing elevated concentrations of asbestos, materials can be reused onsite where geotechnically suitable. Fill containing elevated concentrations of asbestos can only be reused where it will be covered by hard surfacing (asphalt, concrete or similar) or by a minimum 200 mm thickness of cleanfill (soil, gravel etc.).

Soil disposal	As most of the topsoil and fill samples contain concentrations of one or more contaminants above expected background levels these materials are unlikely to be accepted for disposal as cleanfill. These materials would be required to be disposed of as managed fill (or Class 3 material). Deeper natural are suitable for disposal as cleanfill. If surplus to site requirements fill containing elevated concentrations of asbestos is likely to require disposal to landfill, unless a managed fill that can accept asbestos is available.
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7. Conclusions

WWLA has prepared this PSI with limited sampling report to assist Talley's with rezoning of land at 109 Works Road, Fairton, Ashburton. Talley's is proposing a private plan change to take the current zoning of the site from a spot business zone (F) to a more typical industrial zone (E) consistent with adjacent properties. The current proposal is only to rezone the land, no redevelopment or ground works are currently proposed.

The historical review found that the site was used as a freezing works (meat processing) for over one hundred years. The site can be divided into three portions as follows:

- The eastern portion of the site was largely in pastoral use but also included residential dwellings and a cricket ground associated with the freezing works.
- The western portion of the site was used for coal storage (for boilers within the freezing works) and gravel extraction. This portion of the site was later filled with site derived materials, including coal wastes and boiler ash, but has since been remediated during development of the FFH. Contaminated materials are now encapsulated both inground and within two above ground containment bunds.
- The central portion of the site was occupied by the main meat processing/ freezing works plant which included several large buildings, stockyards, rail sidings and sediment ponds. The freezing works were improved and expanded over time.

Soil sampling and subsequent laboratory testing found:

- Typically one or more metals (generally lead and zinc) are present above expected background concentrations in most surficial materials (topsoil and fill) sampled across the site.
- Asbestos is present as both fibres and fragments (although only a single fragment "F1" was identified in TP9) in fill materials present in the vicinity of former residential dwellings and where the previous freezing works plant had been demolished.
- Only the concentrations of asbestos exceed the relevant guidelines for the protection of human health under a commercial / industrial land use. However, the elevated concentrations of asbestos appear to be localised and/or covered. On this basis asbestos is unlikely to present an unacceptable risk to health unless these areas are disturbed by future excavation works.
- Only the concentrations of zinc in a few samples collected from the vicinity of former residential dwellings and around the former freezing works plant area exceed the Eco-SGVs. However, considered in the context of the wider site, distance to sensitive environmental receptors, and low mobility of zinc in soils, the concentrations are not considered to present an unacceptable risk to the environment.

With respect to contamination related consenting requirements:

- **Consents are not required under either the NESCS or CLWRP for the proposed plan change.**
- Other than for small scale projects, consent is likely to be required under the NESCS for future disturbance and/or redevelopment of the site. Consent applications are expected to need to be supported by:
 - Further soil testing to confirm the consent activity status and to better quantify development specific contamination risks and earthworks management requirements.
 - An SMP. An SMP is also recommended to support works undertaken under the permitted activity provisions of the NESCS.

Earthworks implications are provided for reference against future site disturbance or development works. Where it is not already covered, for will be exposed by future works, either remediation or management (covering) of fill containing elevated concentrations of asbestos will be required. To date this fill has only been identified in the central portion of the site, associated with the former freezing works plant and associated facilities. Aside from controls required to remediate or cover fill containing elevated concentrations of asbestos, construction related earthworks are expected to be managed under standard earthworks controls and procedures.

Appendix A. Ecan LLURs



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.

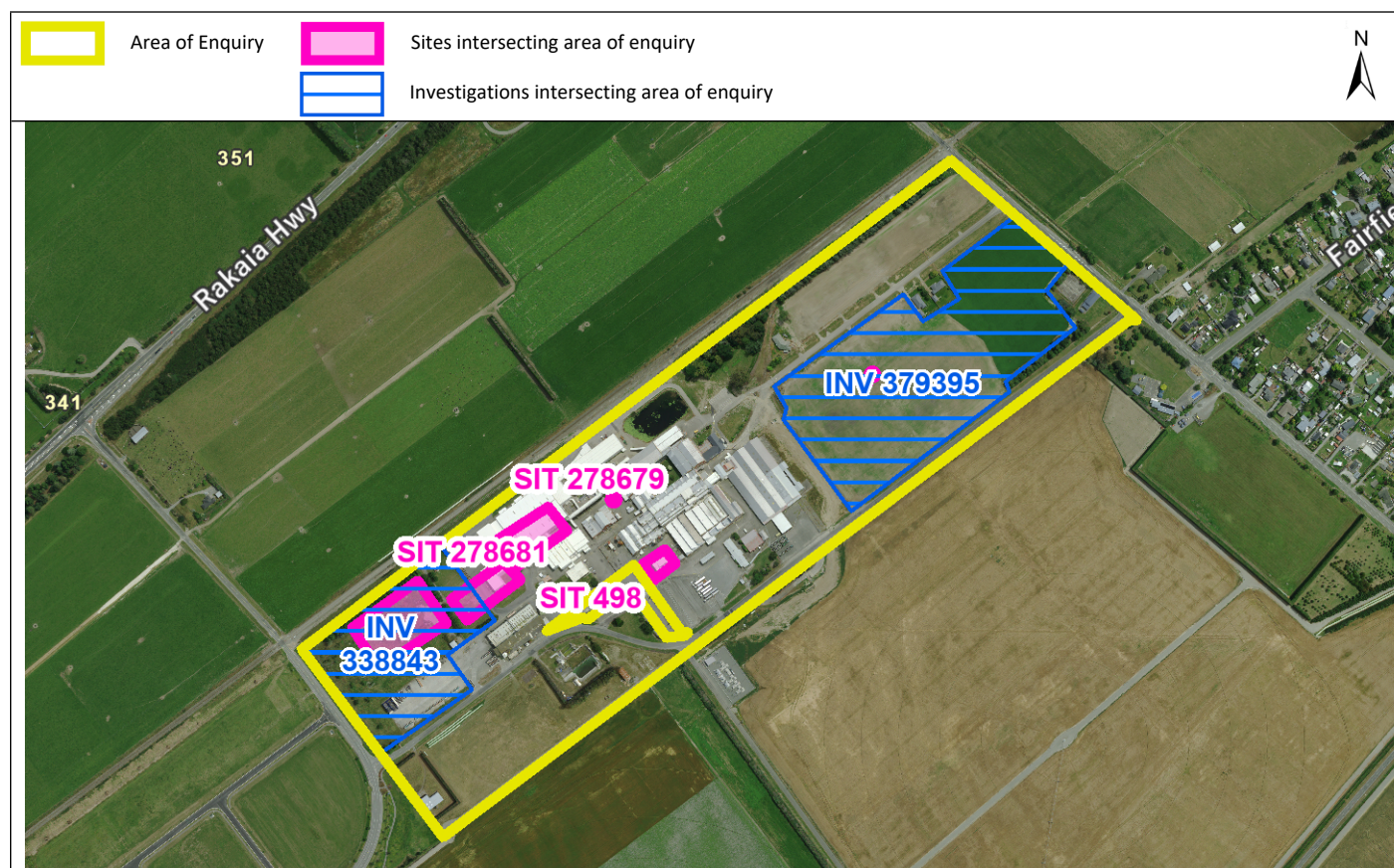
Yours sincerely

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 ENQ386744

Date generated: 07 August 2024
Land parcels: Lot 2 DP 413606
RS 39780



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

Site number	Name	Location	HAIL activity(s)	Category
498	Primary Producers Co-operative Society (PPCS)	Fairton, No 2, RD, Ashburton	A17 - Storage tanks or drums for fuel, chemicals or liquid waste; E5 - Coal or Coke Yards;	Not Investigated
278679	Lot 2 DP 413606	Lot 2 DP 413606	G3 - Landfill sites;	Not Investigated
278681	Lot 2 DP 413606	Lot 2 DP 413606	G3 - Landfill sites;	Yet to be reviewed

More detail about the sites

Site 498: Primary Producers Co-operative Society (PPCS) (Intersects enquiry area.)

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

Location: Fairton, No 2, RD, Ashburton
Legal description(s): Pt Res 1774

HAIL activity(s):	Period from	Period to	HAIL activity
	1972 (poss 1959)	1998	Storage tanks or drums for fuel, chemicals or liquid waste
	1952	1984	Coal or Coke Yards
	1976	Present	Coal or Coke Yards

Notes:

22 Jan 1998 * The meat works takes up many pieces of land, but this is the one where the USTs are. Tanks have been there since at least 1972. They may have been there since 1959, according to old information (see paper file).

6 Oct 2020 A pile of coal (ACT 265059) was noted in a 1976 Retrolens photograph (Run/Photo Number: A/3). A boiler house (ACT 265060) was also noted in latest aerial photographs reviewed. In the 1976 Retrolens photographs (A/3), wagons were present near the coal pile and appear to be transporting coal to the boiler house.

6 Mar 2023 File formerly listed as IN7C/0102-1



Investigations:

INV 338843 **Fairfield Freight Hub, Site Clearance Works Preliminary and Detailed Site Investigation Ground Contamination**
Williamson Water & Land Advisory - Detailed Site Investigation
29 Aug 2022

Summary of investigation(s):

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.

INV 379395 **78 Fairfield Road West & 125 Fairfield Road, Fairton, Ashburton Preliminary and Detailed Site Investigation (Ground Contamination)**
Williamson Water & Land Advisory - Detailed Site Investigation
3 May 2024

Summary of investigation(s):

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.

Site 278679: Lot 2 DP 413606 (Intersects enquiry area.)

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

Location: Lot 2 DP 413606
Legal description(s): Lot 2 DP 413606

HAIL activity(s):	Period from	Period to	HAIL activity
	1941	1961	Landfill sites

Notes:

18 Sep 2020 A pit was noted in aerial photographs reviewed in 1941. The pit appeared to be filled with unidentified material in a 1961 Retrolens photograph (Run/Photo Number: C/10).

18 Sep 2020 This record was created as part of the Ashburton District 2020 HAIL identification project.



Investigations:

There are no investigations associated with this site.

Site 278681: Lot 2 DP 413606 (Intersects enquiry area.)

Category: Yet to be reviewed
Definition: Investigation reports have been received for this site, but we have not yet reviewed them.

Location: Lot 2 DP 413606
Legal description(s): Lot 2 DP 413606

HAIL activity(s):	Period from	Period to	HAIL activity
	1981	Post-1995	Landfill sites

Notes:

18 Sep 2020 A pit was noted in aerial photographs reviewed in 1981. The pit appeared to have been filled with material in aerial photographs reviewed post-1995.

18 Sep 2020 This record was created as part of the Ashburton District 2020 HAIL identification project.



Investigations:

There are no investigations associated with this site.

Disclaimer

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

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

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

Listed Land Use Register

What you need to know



Everything is connected

What is the Listed Land Use Register (LLUR)?

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

Why do we need the LLUR?

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

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

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

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

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

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

We have two main ways of identifying HAIL sites:

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

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

How does Environment Canterbury classify sites on the LLUR?

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

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

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

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

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

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



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

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

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

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

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



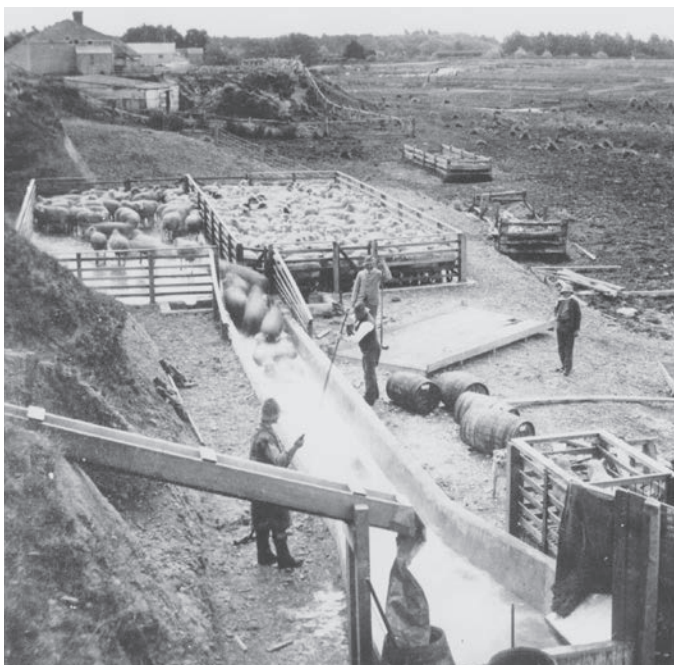
I think my site category is incorrect – how can I change it?

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

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

IMPORTANT!

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



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

Contact us

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

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

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

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:

Calling from Christchurch: (03) 353 9007

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

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 B. ADC building consent list

PHYSICAL ADDRESS: 109 Works Road ASHBURTON DISTRICT

LEGAL DESCRIPTION: RS 39780 and 1 more

FLOOR AREA (sqm): 12,694.03

<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Add/Alter	BC000588		Install tanks, Under road tunnel, Erect wkshop	22/08/2000	11/01/2018	
Add/Alter	BC000899		Alter lambcutting block [stage 2].	30/10/2000	30/01/2018	
NewConstru	BC000991		Erect new destillaging area.	14/12/2000	11/01/2018	
Add/Alter	BC010828		Extend fellmongery.	10/10/2001	16/12/2015	
Add/Alter	BC020715	132.00	Install chiller 35.	15/08/2002	11/04/2003	
Add/Alter	BC020794		Erect 2002 carton chiller.	10/09/2002	15/01/2018	
NewConstru	BC950834		Erect a new degambrelling area	26/10/1995	15/01/2018	
NewConstru	BC950835		Pelt pond alterations.	26/10/1995	04/05/2016	
Demolition	BC960470		Demolish dwelling.	17/05/1996	16/02/1998	
Demolition	BC960744		Demolish old freezer block.	09/08/1996	16/02/1998	
Add/Alter	BC960745		Construct link corridor at coldstore.	09/08/1996	16/12/2015	
NewConstru	BC970930	1,134.00	Construct a meat processing block.	13/11/1997	09/04/1998	
NewConstru	BC971032	360.00	Construct a new lambcutting amenities block.	17/12/1997	09/04/1998	
NewConstru	BC980573		Collect human sewage for treatment & disposa	27/07/1998	11/01/2018	

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
NewConstru	BC980578		Install contrashear.	28/07/1998	04/05/2016	
Add/Alter	BC980687		Build mezzanine floor in pelt house.	02/09/1998	15/01/2018	
Add/Alter	BC990562		Re-roof part of ex mutton slaughterboard.	22/07/1999	16/12/2015	
Add/Alter	BC990620		Extend implement shed.	09/08/1999	17/11/1999	
NewConstru	BC990678		Construct domestic wastewater disposal system	24/08/1999	15/01/2018	
Add/Alter	BC990709		Extend coldstore & alter rails in freezers.	03/09/1999	17/11/1999	
Heaters	BC940783		Install an inbuilt kent logfire.	26/09/1994	26/09/1994	
Add/Alter	BC940844	28.00	Construct bag storage room.	21/10/1994	18/04/1995	
Permits	BP359D		Plumbing/drainage	21/01/1955		
Permits	BP686		Plumbing/drainage	07/09/1957		
Permits	BP717		Plumbing/drainage	20/06/1957		
Permits	BP1032F		Plumbing/drainage	31/03/1959		
Permits	BP1145		Alter/add to dwelling	10/12/1959		
Permits	BP1506		Erect 3 storey cooling floor	11/10/1961		
Permits	BP1705C		Erect a woolshed	23/10/1962		
Permits	BP404B		Plumbing/drainage	18/06/1963		
Permits	BP395		Plumbing/drainage	14/05/1964		
Permits	BP469		Plumbing/drainage	28/04/1964		
Permits	BP470C		Plumbing/drainage	28/04/1964		
Permits	BP1988E		Alter inspectors amenities	30/04/1964		

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Permits	BP1989		Add to shepherds amenities	30/04/1964		
Permits	BP2022		Erect a dwelling	26/05/1964		
Permits	BP503C		Plumbing/drainage	29/04/1965		
Permits	BPPH38458		Alter dwelling	25/03/1965		
Permits	BP616		Plumbing/drainage	12/05/1965		
Permits	BP2236B		Erect a dwelling	25/06/1965		
Permits	BP663A		Plumbing/drainage	16/05/1966		
Permits	BP2252C		Reconstruct coolstore interior	21/07/1965		
Permits	BP2713		Erect a haybarn	24/11/1966		
Permits	BP2834		Alter/add to ammenities	14/04/1967		
Permits	BP3068C		Extend & roof over sheepyards	05/01/1968		
Permits	BP3211B		Alter main office	12/07/1968		
Permits	BP1042C		Plumbing/drainage	27/08/1968		
Permits	BP3277B		Erect a boilerhouse	23/09/1968		
Permits	BP3502		Extend works ammenities	22/05/1969		
Permits	BP3533B		Erect a garage	25/06/1969		
Permits	BP3752A		Erect a carport	31/03/1970		
Permits	BP1319		Plumbing/drainage	30/07/1971		
Permits	BP4138B		Alter office block	30/07/1971		
Permits	BP4209A		Plumbing/drainage	15/12/1971		

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Permits	BP4224		Plumbing/drainage	15/12/1971		
Permits	BP136D		Install a wc	24/01/1972		
Permits	BP755B		Erect a hayshed	12/10/1973		
Permits	BP841E		Alter works building	23/11/1973		
Permits	BP899		Erect a locker room	13/02/1974		
Permits	BP898B		Erect a trades block office	13/02/1974		
Permits	BP1023E		Erect a factory	03/05/1974		
Permits	BP1624B		Plumbing/drainage	05/06/1974		
Permits	BP1633-4		Plumbing/drainage	15/07/1974		
Permits	BP1120F		Erect a carport	14/06/1974		
Permits	BPPH38449		Alter bathroom/toilet	13/07/1974		
Permits	BPPH38450		Add washhouse/toilet	15/07/1974		
Permits	BP1658A		Erect a coldstore & corridor	31/07/1975		
Permits	BP1682		Erect a garage	30/07/1975		
Permits	BP1683B		Erect an electrical control centre	30/07/1975		
Permits	BP1684B		Add leanto onto factory	31/07/1975		
Permits	BP2023C		Erect a conveyor corridor	10/12/1975		
Permits	BP2024		Erect an office & toilet facilities	24/02/1976		
Permits	BP2026B		Reroof store	16/03/1976		
Permits	BP1826A		Plumbing/drainage	15/04/1976		

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Permits	BP2423E		Erect an equipment building	24/09/1976		
Permits	BP2443A		Erect a workshop	20/01/1977		
Permits	BP2491		Erect a garden shed	10/11/1976		
Permits	BP2513		Erect a substation [pallet store]	26/11/1976		
Permits	BP2514D		Erect a substation [engine room]	26/11/1976		
Permits	BP2925C		Convert freezer	29/09/1977		
Permits	BP2979A		Alter ammenities building	03/11/1977		
Permits	BP3120A		Erect a canopy	03/03/1978		
Permits	BP3299C		Erect a building	04/08/1978		
Permits	BP3300		Erect a building	07/08/1978		
Permits	BP3336A		Alter building interior	23/08/1978		
Permits	BP3548B		Cover sheeppyards	26/02/1981		
Permits	BP3576A		Erect a motorcycle shed	08/03/1979		
Permits	BP3772D		Alter sticking pen area	24/10/1979		
Permits	BP2236A		Plumbing/drainage	30/08/1979		
Permits	BP4125		Erect roof over sheepwash	29/04/1980		
Permits	BP4771A		Erect a cafeteria	23/07/1981		
Permits	BP4902		Add offices to existing building	06/10/1981		
Permits	BP5274		Erect an engine control room	02/07/1982		
Permits	BP5293		Add to cricket pavilion	11/08/1982		

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Permits	BP5560		Erect a pelt house	09/05/1983		
Permits	BP2773-4		Plumbing/drainage	05/08/1983		
Permits	BP5900		Erect an amenities building	26/08/1983		
Permits	BP5905A		Erect a pelt shed	21/09/1983		
Permits	BP6213		Erect a toilet	26/04/1984		
Permits	BP3106B		Plumbing	24/12/1984		
Permits	BP3111D		Drainage	14/01/1985		
Permits	BP6638		Erect a storage shed	04/04/1985		
Permits	BP6942		Alter freezer	19/09/1985		
Permits	BP6945		Erect a control room	22/08/1985		
Permits	BP7084		Erect a freezer block	16/12/1985		
Permits	BP7364		Erect an equipment shed	21/10/1986		
Permits	BP7921		Erect a storeshed	14/07/1988		
Permits	BP8041		Convert garage into bedroom	21/12/1988		
Permits	BP8092		Erect a computer servicing room	17/03/1989		
Permits	BPH052589		Alter processing building	09/08/1990		
Permits	BPK04168		Alter slaughterboard	08/07/1992		
Permits	BPK04471		Erect a coldstore loadout canopy	12/11/1992		
NewConstru	BC0045/07	44.00	Erect a bulk meal loadout enclosure & personn	21/02/2007	11/01/2018	
NewConstru	BC0456/08		Erect a pumphouse access platform.	20/05/2008	08/10/2008	

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<u>Consents/Permits</u>	<u>App Number</u>	<u>Floor Area</u>	<u>Description</u>	<u>BC Issued</u>	<u>CCC Issued</u>	<u>Builder</u>
Add/Alter	BC0057/09	13.00	Link Corridor	05/03/2009	31/07/2017	
Add/Alter	BC0440/10		extension to existing lambcutting building - Cor	28/05/2010	07/11/2013	
Add/Alter	BC0463/10		Additions of smoko room and conversion of tw	04/06/2010	24/01/2018	
Add/Alter	BC0690/11	8,605.00	Additions Alterations - Extensions to Lamb Cut	26/08/2011	11/02/2014	
Add/Alter	BC0676/13	78.00	Additions Alterations - Sandwich Panel Room f	24/06/2013	14/09/2017	
Marquee	BC0214/14		Marquee - Marquee for Paddock to Plate	14/03/2014	27/03/2014	
Add/Alter	BC0472/20	14.83	Extension and Alterations to Administration Bui	23/10/2020	14/01/2022	
NewConstru	BC0656/20	56.00	Plant Room	25/02/2021	09/06/2022	
NewConstru	BC0625/21		SEPERATE 3 BEDROOM SLEEP OUT WITH			
NewConstru	BC0170/23	55.80	Dwelling	27/07/2023	01/11/2023	
NewConstru	BC0367/23	2,000.00	Freight Hub Building	12/09/2023	11/04/2024	
NewConstru	BC0457/23		Fairfield Freight Hub - Railway siding	13/09/2023	19/07/2024	
BldResite	BC0533/23	173.40	Foundations and Services for Relocated Office	05/01/2024		

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Appendix C. Hazardous substances register

Inventory Name

Fairfield

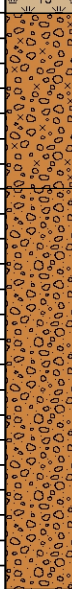
Substance Name	Substance UN Number	Maximum Quantity	Units	Location	Hazard Classifications	HSNO Approval Number	Substance State
30 Seconds Spray & Walk Away	1760	20	L	Workshop yard shed	8.2B	HSR002526	Liquid
AirCOL PD32		40	L	Indoor Storage Cabinet	9.1(biocide)	HSR002606	Liquid
Alcofoam	1170	6	L	Cleaner Storage Room	3.1B 6.4A	HSR002528	Liquid
Ammonia, anhydrous	1005	2000	kg	Refrigeration Plant Room	2.1.1B 6.1C 8.2B 8.3A 9.1A	HSR001035	Gas Non-Permanent
Coolant		25	L	Dangerous Goods Store - separate building	6.1E 6.3A 6.4A 6.9A 9.3C	HSR002684	Liquid
Cyclone Floor Cleaner		10	L	Cleaner Storage Room	6.3A 6.4A	HSR002526	Liquid
Diesel fuel (automotive gas oil and marine diesel fuel)		60	L	Dangerous Goods Store - separate building	3.1D 6.1E 6.3B 6.7B 9.1B	HSR001441	Liquid
Emerald Fresh - Auto Cologne		20	L	Freight Truck Wash Storage Shed	3.1C	HSR002576	Liquid
Frontline	1760	40	L	Cleaner Storage Room	6.1E 8.1A 8.2B 8.3A 9.1A	HSR002526	Liquid
Glass Cleaner Polish		4	L	Freight Truck Wash Storage Shed	6.1E	HSR002530	Liquid
Grape Wash		400	L	Locomotive Shed	6.1E 6.3A 6.4A	HSR002530	Liquid
Hyposan		20	L	Cleaner Storage Room	8.2C 8.3A 9.1B	HSR004692	Liquid
Mag Wheel Cleaner		4	L	Freight Truck Wash Storage Shed	6.9B 8.3A 9.1C	HSR002519	Aerosol
Methylated spirits, denatured with between 0.1% and 2% methanol	1987	4	L	Freight Truck Wash Storage Shed	3.1B 6.1E 6.4A 6.8B 6.9A	HRC000002	Liquid
Pacer - Prepare it	1993	21	L	Freight Truck Wash Storage Shed	3.1C	HSR002528	Liquid
Pacer Streak Free		20	L	Freight Truck Wash Storage Shed	6.3B 6.4A 9.1(biocide)	HSR002530	Liquid
Petrol (unleaded)	1203	40	L	Dangerous Goods Store - separate building	3.1A 6.1E 6.3B 6.7B 9.1B	HRC000003	Liquid
Presto		20	L	Cleaner Storage Room	6.3A 8.3A 9.3C	HSR002530	Liquid
Round Up Ultra Max	3082	60	L	Workshop yard shed	9.1B	HSR100587	Liquid
Rubia Works 4000		230	L	Locomotive Shed	6.3B	HSR002605	Liquid
Supercut Car Polish		8	L	Freight Truck Wash Storage Shed	6.1E 6.4A 9.1C 9.3A	HSR002530	Liquid
Tyre Dressing	1993	20	L	Freight Truck Wash Storage Shed	3.1B 6.1E 6.3B 6.4A 6.9B 9.1B	HSR002662	Liquid
V-Cide 140		100	L	Refrigeration Plant Room	6.1D 6.3A 6.4A 6.5B 9.1D 9.3C	HSR002684	Liquid
V-Trace 130	3267	100	L	Refrigeration Plant Room	6.1D 6.5B 8.1A 8.2B 8.3A 9.1C	HSR002681	Liquid
Vision X		20	L	Freight Truck Wash Storage Shed	6.1E 6.3A 6.4A 9.1D	HSR002530	Liquid
Yates Turfix	3082	1	L	Workshop yard shed	6.1D 6.3A 6.9B 8.3A 9.1A 9.2A 9.3C	HSR000364	Liquid
Zydosan Plus		40	L	Freight Truck Wash Storage Shed	6.4A 9.1(biocide)	HSR002530	Liquid

Appendix D. Test pit logs

 INITIA GEOTECHNICAL SPECIALISTS		TEST PIT LOG					HOLE NO.: TP01	
		CLIENT: Talleys Group		SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446	
		PROJECT: Fairton Plan Change						
		CO-ORDINATES: 1504152.9mE, 5141523.3mN		ELEVATION: 104.7m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024
Co-ordinate system: NZTM		Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024		
Location method: GPSH		Level method: CONTOUR		OPERATOR: Rob		LOGGED BY: GEOCIVIL		
						CHECKED BY: APK		
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane:		WATER
					2 4 6 8 10 12 14 16 18	50 100 150 200	Values	
Topsoil	Silty GRAVEL, with some rootlets, with minor sand; dark brown. Medium dense; non-plastic; moist; gravel, fine and medium, subround to rounded; sand, fine to medium.		0.2	TS	3			
			0.2	TS	4			
			0.2	TS	7			
			0.4	TS	12			
			0.4	TS	10			
			0.6	TS	20			
Late Pleistocene river deposits	Sandy GRAVEL, with some silt, with minor rootlets. Dense; non-plastic; moist; gravel, fine to medium, subangular to angular; sand, fine to medium. 0.6m: Grades to very dense. 1.0m: Grades to with some subrounded to rounded cobbles, up to 90mm and trace organics, wet.		0.6	TS				
			0.8	TS				
			1.0	TS				
			1.2	TS				
			1.4	TS				
			1.6	TS				
			1.8	TS				
			2.0	TS				
			2.2	TS				
			2.4	TS				
			2.6	TS				
			2.8	TS				
			3.0	TS				
			3.2	TS				
			3.4	TS				
			3.6	TS				
	3.8	TS						
	4.0	TS						
	4.2	TS						
	4.4	TS						
	4.6	TS						
	4.8	TS						
			5.0	TS				
			5.2	TS				
			5.4	TS				
			5.6	TS				
			5.8	TS				
			6.0	TS				
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			6.4	TS				
			6.6	TS				
			6.8	TS				
			7.0	TS				
			7.2	TS				
			7.4	TS				
			7.6	TS				
			7.8	TS				
			8.0	TS				
			8.2	TS				
			8.4	TS				
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			9.0	TS				
			9.2	TS				
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			9.8	TS				
			10.0	TS				
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			10.4	TS				
			10.6	TS				
			10.8	TS				
			11.0	TS				
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			14.0	TS				
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			15.0	TS				
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			30.0	TS				
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			30.6	TS				
			30.8	TS				
			31.0	TS				
			31.2	TS				
			31.4	TS				
			31.6	TS				
			31.8	TS				
			32.0	TS				
			32.2	TS				
			32.4	TS				
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			45.8	TS				
			46.0	TS				
			46.2	TS				
			46.4	TS				
			46.6	TS				
			46.8	TS				
			47.0	TS				
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			47.4	TS				
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			48.0	TS				
			48.2	TS				
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			49.8	TS				
			50.0	TS				
			50.2	TS				
			50.4	TS				
			50.6	TS				
			50.8	TS				
			51.0	TS				
			51.2	TS				
			51.4	TS				
			51.6	TS				
			51.8	TS				
			52.0	TS				
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			52.4	TS				
			52.6	TS				
			52.8	TS				
			53.0	TS				
			53.2	TS				
			53.4	TS				
			53.6	TS				

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 INITIA GEOTECHNICAL SPECIALISTS		TEST PIT LOG										HOLE NO.: TP04							
		CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446							
		PROJECT: Fairton Plan Change																	
		CO-ORDINATES: 1504390.5mE, 5141798.2mN					ELEVATION: 106.3m		CONTRACTOR: Tarbotton Land/Civil			START DATE: 05/08/2024							
Co-ordinate system: NZTM					Datum: LYTTHT1937		MACHINE: 12t Excavator			END DATE: 06/08/2024									
Location method: GPSH					Level method: CONTOUR		OPERATOR: Rob			LOGGED BY: GEOCIVIL									
										CHECKED BY: APK									
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)								VANE SHEAR STRENGTH (kPa) Vane:		WATER				
					2	4	6	8	10	12	14	16	18	50	100	150	200	Values	
Topsoil	Silty GRAVEL, with some rootlets; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; [Topsoil].		0.2																
Fill	Silty gravelly SAND, with minor rootlets and some fill (wood and bricks); light brown. Non-plastic; moist; sand, fine to medium; gravel, fine to medium, subround.		0.4																
Late Pleistocene river deposits	Sandy GRAVEL, with trace silt; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium. 1.5m: Grades to with some subrounded to rounded cobbles; up to 90mm and trace organics. 2.5m: Grades to with some silt; cobbles, up to 120mm. EOH: 3.00m		0.6																
			0.8																
			1.0																
			1.2																
			1.4																
			1.6																
			1.8																
			2.0																
			2.2																
			2.4																
			2.6																
			2.8																
			3.0																
			3.2																
			3.4																
	3.6																		
	3.8																		
	4.0																		
	4.2																		
	4.4																		
	4.6																		
	4.8																		
					REMARKS														
					Test Pit terminated at target depth.														
					WATER ▼ Standing Water Level ↙ Out flow ↘ In flow INVESTIGATION TYPE ☐ Hand Auger ☒ Test Pit														

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG						HOLE NO.: TP06				
	CLIENT: Talleys Group PROJECT: Fairton Plan Change			SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446				
	CO-ORDINATES: 1504578.1mE, 5141811.3mN Co-ordinate system: NZTM Location method: GPSH			ELEVATION: 106m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK			
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)				SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)		VANE SHEAR STRENGTH (kPa) Vane:		WATER
							2 4 6 8 10 12 14 16 18		50 100 150 200		Values
Topsoil	Silty GRAVEL, with trace sand; dark brown. Loose; non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil].				0.2		3				
Late Pleistocene river deposits	Silty GRAVEL, with minor rootlets; light brown. Medium dense; non-plastic; moist; gravel, fine to medium, subround to rounded. 0.6m: Grades to very dense.				0.4		7				
					0.6		17				
					0.8		20				
					1.0						
					1.2						
					1.4						
					1.6						
					1.8						
					2.0						
					2.2						
	EOH: 2.60m				2.4						
					2.6						
					2.8						
					3.0						
					3.2						
					3.4						
					3.6						
					3.8						
					4.0						
					4.2						
					4.4						
					4.6						
					4.8						

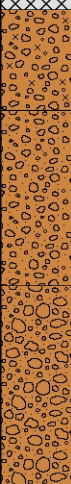
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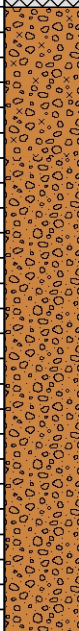
 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP07												
	CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446												
	PROJECT: Fairton Plan Change																						
	CO-ORDINATES: 1504702.3mE, 5141911.5mN					ELEVATION: 106.8m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024													
Co-ordinate system: NZTM					Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024		LOGGED BY: GEOCIVIL												
Location method: GPSH					Level method: CONTOUR		OPERATOR: Rob		CHECKED BY: APK														
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)			SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)				VANE SHEAR STRENGTH (kPa) Vane:				WATER									
						2	4	6	8	10	12	14	16	18	50	100	150	200	Values				
Topsoil SILT, with some rootlets and gravel, with minor sand; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil].				0.2																			
				0.4																			
Late Pleistocene river deposits Silty GRAVEL, with minor rootlets; light brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil]. Sandy GRAVEL, with some cobbles, with trace silt. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, subround to rounded, up to 160mm. 2.2m: Grades to greyish brown. EOH: 2.70m				0.6																			
				0.8																			
				1.0																			
				1.2																			
				1.4																			
				1.6																			
				1.8																			
				2.0																			
				2.2																			
				2.4																			
				2.6																			
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				3.2																			
				3.4																			
	3.6																						
	3.8																						
	4.0																						
	4.2																						
	4.4																						
	4.6																						
	4.8																						
					REMARKS																		
					Test Pit terminated at target depth.																		
					WATER																		
					☐ Standing Water Level																		
					☐ Out flow																		
					☐ In flow																		
					INVESTIGATION TYPE																		
					☐ Hand Auger																		
					☒ Test Pit																		

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 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP08												
	CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446												
	PROJECT: Fairton Plan Change																						
	CO-ORDINATES: 1504649.8mE, 5142017.8mN					ELEVATION: 107.4m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024													
Co-ordinate system: NZTM					Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024		LOGGED BY: GEOCIVIL												
Location method: GPSH					Level method: CONTOUR		OPERATOR: Rob		CHECKED BY: APK														
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)			SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)				VANE SHEAR STRENGTH (kPa) Vane:				WATER									
						2	4	6	8	10	12	14	16	18	50	100	150	200	Values				
Topsoil SILT, with some rootlets and gravel, with minor sand; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil].				0.2																			
				0.4																			
Late Pleistocene river deposits Silty GRAVEL, with minor rootlets; light brown. Low plasticity; moist; gravel, fine to medium, subround to rounded, tightly packed. Sandy GRAVEL, with some cobbles, with trace silt. Non-plastic; wet; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, subround to rounded, up to 160mm. 2.2m: Grades to grey, moist. EOH: 2.80m				0.6																			
				0.8																			
				1.0																			
				1.2																			
				1.4																			
				1.6																			
				1.8																			
				2.0																			
				2.2																			
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	3.8																						
	4.0																						
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	4.4																						
	4.6																						
	4.8																						
			REMARKS Test Pit terminated at target depth.																				
			WATER ☐ Standing Water Level ☐ Out flow ☐ In flow																				
			INVESTIGATION TYPE ☐ Hand Auger ☒ Test Pit																				

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 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG						HOLE NO.: TP09	
	CLIENT: Talleys Group PROJECT: Fairton Plan Change			SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446	
	CO-ORDINATES: 1504586.5mE, 5142072.1mN Co-ordinate system: NZTM Location method: GPSH			ELEVATION: 107.9m Datum: LYTTHT1937 Level method: CONTOUR			CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob	
							START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK	
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane:		WATER
					2 4 6 8 10 12 14 16 18	50 100 150 200	Values	
Fill	SILT, with some rootlets, minor fill (bricks, concrete and tiling) and gravel; dark brown. Medium dense to dense; non-plastic; moist; gravel, fine to medium, subround to rounded.		0.2 0.4		3 4 4 4			
Late Pleistocene river deposits	Silty GRAVEL, with some cobbles; brown. Very dense; low plasticity; moist; gravel, fine to medium, subround to rounded; cobbles, subround to rounded, up to 130mm.		0.6		11	17	20	
	Sandy GRAVEL, with some cobbles, with trace silt; brown. Very dense; non-plastic; wet; gravel, fine to medium, subround to rounded; sand, fine to medium; cobbles, subround to rounded, up to 120mm.		0.8 1.0 1.2 1.4 1.6 1.8					
	Sandy cobbly GRAVEL, with some boulders; greyish brown. Very dense; moist; gravel, fine to medium, subround to rounded; sand, fine to medium, cobbles, subround to rounded, up to 120mm; boulders, subround to rounded, up to 250mm.		2.0 2.2 2.4					
	EOH: 2.50m		2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8					
					REMARKS			
					Test Pit terminated at target depth.			
					WATER			
					INVESTIGATION TYPE			
					☒ Standing Water Level			
					☐ Out flow			
					☐ In flow			
					☐ Hand Auger			
					☒ Test Pit			

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG														HOLE NO.: TP10							
	CLIENT: Talleys Group PROJECT: Fairton Plan Change				SITE LOCATION: 220 Office Road, Fairton, Ashburton										Project Ref.: P-002446							
	CO-ORDINATES: 1504441.4mE, 5141975.7mN Co-ordinate system: NZTM Location method: GPSH				ELEVATION: 107.5m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK													
MATERIAL DESCRIPTION (See Classification & Symbolology sheet for details)				SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)										VANE SHEAR STRENGTH (kPa) Vane:				Values	WATER
							2	4	6	8	10	12	14	16	18	50	100	150	200			
Fill	SILT, with some rootlets, some fill (bricks) and gravel; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded.				0.2																	
Late Pleistocene river deposits	Silty GRAVEL, with minor sand; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.				0.4																	
	Sandy GRAVEL, with some silt. Non-plastic; wet; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.				0.6																	
	EOH: 2.80m				0.8																	
	1.5m: Grades to with some subrounded to rounded cobbles, up to 250mm.				1.0																	
					1.2																	
					1.4																	
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				27.6															</			

Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:10 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP11									
	CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446									
	PROJECT: Fairton Plan Change																			
	CO-ORDINATES: 1504386.2mE, 5141915.7mN					ELEVATION: 107.1m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024										
Co-ordinate system: NZTM					Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024		LOGGED BY: GEOCIVIL									
Location method: GPSH					Level method: CONTOUR		OPERATOR: Rob		CHECKED BY: APK											
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)			SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)				VANE SHEAR STRENGTH (kPa) Vane:				WATER						
						2	4	6	8	10	12	14	16	18	50	100	150	200	Values	
Fill	SILT, with some rootlets, some fill (bricks) and gravel; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded.			0.2																
Late Pleistocene river deposits	Silty GRAVEL, with minor sand; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.			0.4																
	Sandy GRAVEL, with some silt; brown. Non-plastic; wet; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.			0.6																
	1.6m: Grades to with some cobbles, up to 200mm.			0.8																
				1.0																
				1.2																
				1.4																
				1.6																
				1.8																
				2.0																
				2.2																
	EOH: 2.50m			2.4																
				2.6																
				2.8																
				3.0																
				3.2																
				3.4																
				3.6																
				3.8																
				4.0																
				4.2																
				4.4																
				4.6																
				4.8																
						REMARKS														
						Test Pit terminated at target depth.														
						WATER														
						☐ Standing Water Level														
						☐ Out flow														
						☐ In flow														
						INVESTIGATION TYPE														
						☐ Hand Auger														
						☒ Test Pit														

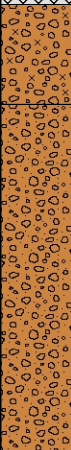
Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:12 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP12								
	CLIENT: Talleys Group PROJECT: Fairton Plan Change					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446								
	CO-ORDINATES: 1504245.0mE, 5141823.1mN Co-ordinate system: NZTM Location method: GPSH					ELEVATION: 106.5m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK									
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)						VANE SHEAR STRENGTH (kPa) Vane:				WATER				
					2	4	6	8	10	12	14	16	18	50	100	150	200	Values	
Fill	Silty GRAVEL, with some rootlets, some fill (bricks, wood, rubber), with minor sand and cobbles; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium, cobbles, subround to rounded, up to 160mm.		0.2												Groundwater Not Encountered				
	COBBLES, with some fill (concrete blocks, bricks, timber and plastic) and silt and sand; brown. Non-plastic; moist; cobbles, subround to rounded, up to 200mm; sand, fine to medium.		0.4																
		0.6																	
		0.8																	
		1.0																	
		1.2																	
		1.4																	
		1.6																	
		1.8																	
		2.0																	
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		4.0																	
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		4.4																	
		4.6																	
		4.8																	
Late Pleistocene river deposits	Sandy GRAVEL, with some cobbles; brown. Wet; gravel, fine to medium, subangular to angular, tightly packed; sand, fine to medium; cobbles, subround to rounded, up to 90mm. EOH: 2.50m		2.2																
			2.4																
			2.6																
			2.8																
			3.0																
			3.2																
			3.4																
			3.6																
			3.8																
			4.0																
			4.2																
			4.4																
			4.6																
			4.8																
				REMARKS Test Pit terminated at target depth.															
				WATER Standing Water Level Out flow In flow															
				INVESTIGATION TYPE Hand Auger Test Pit															

Ver 2: Generated with CORE-GS by Gero - Test Pit_Initia_v1 - 26/08/2024 7:13:14 pm

 GEOTECHNICAL SPECIALISTS	TEST PIT LOG					HOLE NO.: TP13				
	CLIENT: Talleys Group		SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446				
	PROJECT: Fairton Plan Change									
	CO-ORDINATES: 1504369.5mE, 5141740.5mN		ELEVATION: 106.3m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024			
Co-ordinate system: NZTM		Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024				
Location method: GPSH		Level method: CONTOUR		OPERATOR: Rob		LOGGED BY: GEOCIVIL				
						CHECKED BY: APK				
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)			SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane:	WATER		
						2 4 6 8 10 12 14 16 18	50 100 150 200	Values		
To ps oil										
Late Pleistocene river deposits Silty GRAVEL, with some carbonaceous, with minor sand; dark brown. Medium dense; non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil]. Silty GRAVEL; brown. Medium dense to dense; non-plastic; moist; gravel, fine to medium, subround. Gravelly SILT, with some sand, with minor rootlets. Medium dense; non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium. Sandy GRAVEL, with some cobbles; brown. Dense to very dense; wet; gravel, fine to medium, subround to rounded; sand, fine to medium; cobbles, subround to rounded, up to 140mm. EOH: 2.80m				0.2	4	5	16			
				0.4	7					
				0.6	3	3	4			
				0.8	11					
				1.0	20					
				1.2						
				1.4						
				1.6						
				1.8						
				2.0						
				2.2						
				2.4						
				2.6						
				2.8						
				3.0						
	3.2									
	3.4									
	3.6									
	3.8									
	4.0									
	4.2									
	4.4									
	4.6									
	4.8									
					REMARKS					
					Test Pit terminated at target depth.					
					WATER					
					☒ Standing Water Level					
					☐ Out flow					
					☐ In flow					
					INVESTIGATION TYPE					
					☐ Hand Auger					
					☒ Test Pit					

Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:17 pm

 I N I T I A GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP14								
	CLIENT: Talleys Group PROJECT: Fairton Plan Change					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446								
	CO-ORDINATES: 1504288.4mE, 5141734.6mN Co-ordinate system: NZTM Location method: GPSH					ELEVATION: 106.2m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK									
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)								VANE SHEAR STRENGTH (kPa) Vane:				WATER		
					2	4	6	8	10	12	14	16	18	50	100	150	200	Values	
Fill	Sandy GRAVEL, with some fill (brick, concrete, wood, and plastic) and silt and cobbles; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; cobbles, subround to rounded, up to 140mm.		0.2																
	SILT; brown with black streaks. Non-plastic; moist.		0.4																
Late Pleistocene river deposits	Silty GRAVEL, with some sand; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.		0.6																
			0.8																
	Sandy GRAVEL, with some cobbles; brown. Moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, subround, up to 140mm.		1.0																
			1.2																
			1.4																
			1.6																
			1.8																
			2.0																
			2.2																
			2.4																
	EOH: 2.60m		2.6																
			2.8																
			3.0																
			3.2																
			3.4																
			3.6																
			3.8																
			4.0																
			4.2																
			4.4																
			4.6																
			4.8																
		REMARKS																	
		Test Pit terminated at target depth.																	
		WATER																	
		▼ Standing Water Level ↗ Out flow ↘ In flow ☐ Hand Auger ☒ Test Pit																	

Ver 2: Generated with CORE-GS by Geroo - Test Pit_Initia_v1 - 26/08/2024 7:13:19 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG						HOLE NO.: TP15	
	CLIENT: Talleys Group			SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446	
	PROJECT: Fairton Plan Change							
	CO-ORDINATES: 1504225.8mE, 5141745.2mN			ELEVATION: 106.1m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024
Co-ordinate system: NZTM			Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024	
Location method: GPSH			Level method: CONTOUR		OPERATOR: Rob		LOGGED BY: GEOCIVIL	
							CHECKED BY: APK	
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane:		WATER
					2 4 6 8 10 12 14 16 18	50 100 150 200	Values	
Fill	Sandy GRAVEL, with some fill (brick, concrete and wood) and silt; grey. Dense to very dense; non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium.		0.2		11			ndwater Not Encount
			0.4		20			
	GRAVEL; grey. Very dense; wet; gravel, fine to medium, subangular to angular. EOH: 0.60m		0.6					
			0.8					
			1.0					
			1.2					
			1.4					
			1.6					
			1.8					
			2.0					
			2.2					
			2.4					
			2.6					
			2.8					
			3.0					
			3.2					
			3.4					
			3.6					
			3.8					
			4.0					
			4.2					
			4.4					
			4.6					
			4.8					
		REMARKS Test pit refusal at 0.6m bgl.						
		WATER ▼ Standing Water Level ↖ Out flow ↗ In flow INVESTIGATION TYPE ☐ Hand Auger ☒ Test Pit						

 INITIA GEOTECHNICAL SPECIALISTS		TEST PIT LOG										HOLE NO.: TP16				
		CLIENT: Talleys Group PROJECT: Fairton Plan Change					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446				
		CO-ORDINATES: 1504114.2mE, 5141659.9mN Co-ordinate system: NZTM Location method: GPSH					ELEVATION: 105.9m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK					
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)				SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)						VANE SHEAR STRENGTH (kPa) Vane:			WATER
Fill	Sandy GRAVEL, with some silt; grey. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.				0.2											
					0.4											
Late Pleistocene river deposits	Silty GRAVEL, with some sand, with minor rootlets; light brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.				0.6											Groundwater Not Encountered
	Sandy GRAVEL, with some cobbles; grey. Wet; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, subround to rounded, up to 150mm.				0.8											
					1.0											
					1.2											
					1.4											
					1.6											
					1.8											
					2.0											
					2.2											
					2.4											
	EOH: 2.50m				2.6											
					2.8											
					3.0											
					3.2											
					3.4											
				3.6												
				3.8												
				4.0												
				4.2												
				4.4												
				4.6												
				4.8												
						REMARKS										
						Test Pit terminated at target depth.										
						WATER				INVESTIGATION TYPE						
						▼ Standing Water Level ↰ Out flow ▷ In flow				☐ Hand Auger ☒ Test Pit						

Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:23 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP17									
	CLIENT: Talleys Group PROJECT: Fairton Plan Change					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446									
	CO-ORDINATES: 1503996.9mE, 5141560.1mN Co-ordinate system: NZTM Location method: GPSH					ELEVATION: 105.1m Datum: LYTTHT1937 Level method: CONTOUR		CONTRACTOR: Tarbotton Land/Civil MACHINE: 12t Excavator OPERATOR: Rob		START DATE: 05/08/2024 END DATE: 06/08/2024 LOGGED BY: GEOCIVIL CHECKED BY: APK										
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)			SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)				VANE SHEAR STRENGTH (kPa) Vane:				WATER						
						2	4	6	8	10	12	14	16	18	50	100	150	200	Values	
Topsoil	SILT, with some rootlets and gravel, with minor sand; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil].			0.2	TS															
Late Pleistocene river deposits	Silty GRAVEL, with some sand, with minor rootlets; light brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium.			0.4	TS															
				0.6	TS															
				0.8	TS															
				1.0	TS															
				1.2	TS															
				1.4	TS															
				1.6	TS															
				1.8	TS															
				2.0	TS															
				2.2	TS															
	Sandy GRAVEL, with some cobbles; light brown. Moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, up to 90mm.			2.4	TS															
	EOH: 2.50m			2.6																
				2.8																
				3.0																
				3.2																
				3.4																
				3.6																
				3.8																
				4.0																
				4.2																
				4.4																
				4.6																
				4.8																
			REMARKS Test Pit terminated at target depth. WATER ▼ Standing Water Level ↖ Out flow ↗ In flow INVESTIGATION TYPE ☐ Hand Auger ☒ Test Pit																	

Ver 2: Generated with CORE-GS by Gero - Test Pit_Initia_v1 - 26/08/2024 7:13:25 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG						HOLE NO.: TP18		
	CLIENT: Talleys Group			SITE LOCATION: 220 Office Road, Fairton, Ashburton			Project Ref.: P-002446		
	PROJECT: Fairton Plan Change								
	CO-ORDINATES: 1504108.6mE, 5141589.7mN			ELEVATION: 105.4m		CONTRACTOR: Tarbotton Land/Civil		START DATE: 05/08/2024	
Co-ordinate system: NZTM			Datum: LYTTHT1937		MACHINE: 12t Excavator		END DATE: 06/08/2024		
Location method: GPSH			Level method: CONTOUR		OPERATOR: Rob		LOGGED BY: GEOCIVIL		
							CHECKED BY: APK		
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)				SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane:	WATER
							2 4 6 8 10 12 14 16 18	50 100 150 200	Values
To ps oil Fill Late Pleistocene river deposits Silty GRAVEL, with minor rootlets and sand; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium; [Topsoil]. Sandy GRAVEL, with some fill (asphalt and brick) and silt; dark greyish black. Medium dense to dense; non-plastic; moist; gravel, fine and medium, subangular to angular; sand, fine to coarse. Gravelly SILT, with some sand; light brown. Very loose to medium dense; non-plastic; moist; gravel, fine to medium, subround to rounded; sand, fine to medium. Sandy GRAVEL, with minor rootlets. Very dense; moist; gravel, fine to medium, subround to rounded; sand, fine to medium. EOH: 2.50m 2.3m: Grades to with some silt.					0.2		4 5 16 16		Groundwater Not Encountered
	0.4		6 2 5 6						
	0.6								
	0.8			20					
	1.0								
	1.2								
	1.4								
	1.6								
	1.8								
	2.0								
	2.2								
	2.4								
	2.6								
	2.8								
	3.0								
	3.2								
	3.4								
	3.6								
	3.8								
	4.0								
	4.2								
	4.4								
	4.6								
	4.8								
				REMARKS Test Pit terminated at target depth.					
				WATER ▼ Standing Water Level ↖ Out flow ↗ In flow INVESTIGATION TYPE ☐ Hand Auger ☒ Test Pit					

Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:27 pm

 I N I T I A GEOTECHNICAL SPECIALISTS		TEST PIT LOG										HOLE NO.: TP19							
		CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446							
		PROJECT: Fairton Plan Change																	
		CO-ORDINATES: 1504097.6mE, 5141511.8mN					ELEVATION: 105m		CONTRACTOR: Tarbotton Land/Civil			START DATE: 05/08/2024							
Co-ordinate system: NZTM					Datum: LYTTHT1937		MACHINE: 12t Excavator			END DATE: 06/08/2024									
Location method: GPSH					Level method: CONTOUR		OPERATOR: Rob			LOGGED BY: GEOCIVIL									
										CHECKED BY: APK									
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)								VANE SHEAR STRENGTH (kPa) Vane:				WATER		
					2	4	6	8	10	12	14	16	18	50	100	150		200	Values
Topsoil	Gravelly SILT, with some rootlets; dark brown. Non-plastic; moist; gravel, fine to medium; [Topsoil].		0.2	TS															
Late Pleistocene river deposits	Silty GRAVEL, with some cobbles; light brown. Non-plastic; gravel, fine to medium, subround to rounded, tightly packed; cobbles, subround, up to 140mm.		0.4	TS															
			0.6	TS															
	Sandy GRAVEL, with some cobbles, with trace silt; grey. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, up to 180mm.		0.8	TS															
			1.0	TS															
			1.2	TS															
			1.4	TS															
			1.6	TS															
			1.8	TS															
			2.0	TS															
			2.2	TS															
			2.4	TS															
			2.6	TS															
			2.8																
			3.0																
			3.2																
	3.4																		
	3.6																		
	3.8																		
	4.0																		
	4.2																		
	4.4																		
	4.6																		
	4.8																		
		REMARKS																	
		Test Pit terminated at target depth.																	
		WATER																	
		▼ Standing Water Level ↰ Out flow ↱ In flow ☐ Hand Auger ☒ Test Pit																	

Ver 2: Generated with CORE-GS by Geoc - Test Pit_Initia_v1 - 26/08/2024 7:13:32 pm

 INITIA GEOTECHNICAL SPECIALISTS	TEST PIT LOG										HOLE NO.: TP22										
	CLIENT: Talleys Group					SITE LOCATION: 220 Office Road, Fairton, Ashburton					Project Ref.: P-002446										
	PROJECT: Fairton Plan Change																				
	CO-ORDINATES: 1503904.0mE, 5141328.7mN					ELEVATION: 103.8m					CONTRACTOR: Tarbotton Land/Civil										
Co-ordinate system: NZTM					Datum: LYTTHT1937					MACHINE: 12t Excavator											
Location method: GPSH					Level method: CONTOUR					OPERATOR: Rob											
										START DATE: 05/08/2024											
										END DATE: 06/08/2024											
										LOGGED BY: GEOCIVIL											
										CHECKED BY: APK											
MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)		SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)								VANE SHEAR STRENGTH (kPa) Vane:				WATER				
					2	4	6	8	10	12	14	16	18	50	100	150	200	Values			
Topsoil	Gravelly SILT, with some rootlets; dark brown. Non-plastic; moist; gravel, fine to medium, subround to rounded; [Topsoil].		0.2																		
Late Pleistocene river deposits	Silty GRAVEL, with some sand and cobbles; light brown. Non-plastic; wet; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium, cobbles, subround to rounded, up to 140mm. Sandy GRAVEL, with some cobbles, with trace silt; brown. Non-plastic; moist; gravel, fine to medium, subround to rounded, tightly packed; sand, fine to medium; cobbles, up to 180mm. EOH: 2.80m		0.4																		
			0.6																		
			0.8																		
			1.0																		
			1.2																		
			1.4																		
			1.6																		
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			2.0																		
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			3.6																		
			3.8																		
			4.0																		
			4.2																		
			4.4																		
			4.6																		
			4.8																		
					REMARKS																
					Test Pit terminated at target depth.																
					WATER																
					☐ Standing Water Level																
					☐ Out flow																
					☐ In flow																
					INVESTIGATION TYPE																
					☐ Hand Auger																
					☒ Test Pit																

Appendix E. Laboratory transcripts



Certificate of Analysis

WWLA
P O Box 314
Kumeu 0841
Attention: Cherise Martin
Phone: 027 536 8751
Email: cherise.martin@wwla.kiwi

Lab Reference: 24-24472
Submitted by: Cherise
Date Received: 6/08/2024
Testing Initiated: 9/08/2024
Date Completed: 12/08/2024
Order Number: Plan Change
Reference: WWLA1240

Sampling Site:
Description of Work: Combo / Bulk - WWLA1240

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report. Specific testing dates are available on request.

Asbestos in Soil (Qualitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
24-24472-1	TP1 0.1		Soil		12/08/2024
24-24472-2	TP10 0.1		Soil		12/08/2024
24-24472-3	TP11 0.1		Soil		12/08/2024
24-24472-4	TP12 0.1		Soil		12/08/2024
24-24472-5	TP12 0.8		Soil		12/08/2024
24-24472-6	TP14 0.1		Soil		12/08/2024
24-24472-7	TP15 0.1		Soil		12/08/2024
24-24472-8	TP16 0		Soil		12/08/2024
24-24472-9	TP16 0.5		Soil		12/08/2024
24-24472-10	TP17 0.1		Soil		12/08/2024
24-24472-11	TP18 0.4		Soil		12/08/2024
24-24472-12	TP21 0.1		Soil		12/08/2024
24-24472-13	TP22 0.1		Soil		12/08/2024
24-24472-14	TP9 0.5		Soil		12/08/2024

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled.

Laboratory ID	Client Sample ID	Fibre Types	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
Units				
24-24472-1	TP1 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-2	TP10 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation with the exception of tests marked *, which are not accredited.
This test report shall not be reproduced except in full, without the written permission of Analytica Laboratories.

Laboratory ID	Client Sample ID	Fibre Types	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
Units				
24-24472-3	TP11 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-4	TP12 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-5	TP12 0.8	Chrysotile (White Asbestos) Organic Fibres	Absent	Present
24-24472-6	TP14 0.1	Chrysotile (White Asbestos) Organic Fibres	Absent	Present
24-24472-7	TP15 0.1	Chrysotile (White Asbestos) Organic Fibres	Absent	Present
24-24472-8	TP16 0	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-9	TP16 0.5	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-10	TP17 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-11	TP18 0.4	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-12	TP21 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-13	TP22 0.1	Asbestos NOT Detected. Organic Fibres	Absent	Absent
24-24472-14	TP9 0.5	Chrysotile (White Asbestos) Amosite (Brown Asbestos) Organic Fibres	Absent	Present

Information in the above table supplied by the client: Client Sample ID.

Asbestos in Soil (Qualitative) Approver:



Stef Zhou
Asbestos Lab Tech

Method Summary

Asbestos Fibres in Soil (Qualitative)

Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.

Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques.

Note 2: Trace asbestos is indicative that freely liberated respirable fibres are present and dust control measures should be implemented or increased on site. This is not the sole indicator for the friable nature of the asbestos present.

Note 3: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised.

Note 4: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.



Certificate of Analysis

WWLA
P O Box 314
Kumeu 0841
Attention: Cherise Martin
Phone: 027 536 8751
Email: cherise.martin@wwla.kiwi

Lab Reference: 24-24472
Submitted by: Cherise
Date Received: 6/08/2024
Testing Initiated: 9/08/2024
Date Completed: 14/08/2024
Order Number: Plan Change
Reference: WWLA1240

Sampling Site:
Description of Work: Combo / Bulk - WWLA1240

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report. Specific testing dates are available on request.

Asbestos in Soil (Semi-Quantitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
24-24472-5	TP12 0.8		Soil		14/08/2024
24-24472-6	TP14 0.1		Soil		14/08/2024
24-24472-7	TP15 0.1		Soil		14/08/2024
24-24472-14	TP9 0.5		Soil		14/08/2024

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled

Analysis Results (Summary)

Laboratory ID	Client Sample ID	Asbestos	Sample Weight as Received	Moisture Content	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
Units			g	%		
24-24472-5	TP12 0.8	Chrysotile (White Asbestos) Organic Fibres	745.0	8.4	Absent	Present
24-24472-6	TP14 0.1	Chrysotile (White Asbestos) Organic Fibres	891.0	6.8	Absent	Present
24-24472-7	TP15 0.1	Chrysotile (White Asbestos) Organic Fibres	633.1	11.7	Absent	Present
24-24472-14	TP9 0.5	Chrysotile (White Asbestos) Amosite (Brown Asbestos) Organic Fibres	639.8	10.4	Present	Present

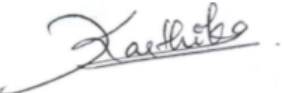
Information in the above table supplied by the client: Client Sample ID

Analysis Results (Size Fraction Breakdown)

Laboratory ID	Client Sample ID	Fraction Size	Fraction Weight*	AF/FA Weight*	ACM Weight*	ACM Content*	Asbestos Matrix	Asbestos Weight*	W/W% Asbestos*
Units Reporting Limit			g 0	g 0	g 0	%		g 0	
24-24472-5	TP12 0.8	>10mm	327.91	0.0000	0.0000	0	No Asbestos Detected	0.0000	<0.001 (ACM) 0.007 (AF/FA)
		2-10mm	168.71	0.0495	-	-	Free Fibres Fibre Bundle	0.0495	
		<2mm	186.05	0.0009	-	-	Free Fibres	0.0017	
24-24472-6	TP14 0.1	>10mm	364.31	0.0000	0.0000	0	No Asbestos Detected	0.0000	<0.001 (ACM) <0.001 (AF/FA)
		2-10mm	257.24	0.0023	-	-	Fibre Bundle	0.0023	
		<2mm	208.80	0.0000	-	-	No Asbestos Detected	0.0000	
24-24472-7	TP15 0.1	>10mm	226.58	0.0000	0.0000	0	No Asbestos Detected	0.0000	<0.001 (ACM) 0.113 (AF/FA)
		2-10mm	171.28	0.6343	-	-	Fibre Bundle	0.6343	
		<2mm	161.18	0.0000	-	-	No Asbestos Detected	0.0000	
24-24472-14	TP9 0.5	>10mm	249.88	0.0003	0.0000	0	Free Fibres	0.0003	<0.001 (ACM) 0.043 (AF/FA)
		2-10mm	125.52	0.2408	-	-	Free Fibres Fibre Bundle	0.2408	
		<2mm	197.84	0.0028	-	-	Free Fibres Fibre Bundle	0.0056	

Information in the above table supplied by the client: Client Sample ID

Asbestos in Soil (Semi-Quantitative) Approver:



Karthika Unnikrishnan, M.Sc.
Technician

Method Summary

Asbestos Fibres in Soil (Semi-Quantitative)

Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with AS4964-2004 Method for the qualitative identification of asbestos in soil samples.

Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques.

Note 2: Trace asbestos is indicative that freely liberated respirable fibres are present and dust control measures should be implemented or increased on site. This is not the sole indicator for the friable nature of the asbestos present.

Note 3: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised.

Note 4: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.



Certificate of Analysis

WWLA
P O Box 314
Kumeu 0841
Attention: Cherise Martin
Phone: 027 536 8751
Email: cherise.martin@wwla.kiwi

Lab Reference: 24-24472
Submitted by: Cherise
Date Received: 6/08/2024
Testing Initiated: 9/08/2024
Date Completed: 9/08/2024
Order Number: Plan Change
Reference: WWLA1240

Sampling Site:
Description of Work: Combo / Bulk - WWLA1240

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories (or at the subcontracted laboratories, when applicable).
Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

Asbestos Fibres in Bulk (Qualitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
24-24472-15	F1		Bulk Materials (60x40x5mm)		9/08/2024

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled.

Analysis Results

Laboratory ID	Client Sample ID	Sample Layers	Fibre Types	Asbestos (Present / Absent)
24-24472-15	F1	L1 - Paint L2 - Fibrous Cement Sheet L3 - Surface Debris	Chrysotile (White Asbestos) Amosite (Brown Asbestos) Organic Fibres	Present

Information in the above table supplied by the client: Client Sample ID.

Asbestos Fibres in Bulk (Qualitative) Approver:

Stef Zhou
Asbestos Lab Tech

Method Summary

Asbestos Fibres in Bulk Materials (Qualitative)

Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with the guidelines of AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.

Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques.

Note 2: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised.

Note 3: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.



Certificate of Analysis

WWLA
P O Box 314
Kumeu 0841Attention: Cherise Martin
Phone: 0275368751
Email: wendi.williamson@wwla.kiwiLab Reference: 24-24800
Submitted by: Cherise
Date Received: 9/08/2024
Testing Initiated: 9/08/2024
Date Completed: 16/08/2024
Order Number: Plan Change
Reference: WWLA1240

Sampling Site:

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report. Specific testing dates are available on request.

Heavy Metals in Soil

Client Sample ID			TP1 0.1	TP2 0.1	TP9 0.1	TP9 0.7	TP10 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-1	24-24800-5	24-24800-9	24-24800-11	24-24800-13
Arsenic	mg/kg dry wt	0.125	4.9	7.6	5.6	5.6	12
Cadmium	mg/kg dry wt	0.005	0.056	0.037	0.18	0.032	0.22
Chromium	mg/kg dry wt	0.125	17.8	17.7	18.6	21.9	18.0
Copper	mg/kg dry wt	0.075	8.76	7.80	17.0	9.05	14.9
Lead	mg/kg dry wt	0.25	37.6	24.5	147	21.8	99.6
Nickel	mg/kg dry wt	0.05	11.3	12.5	12.9	16.3	11.9
Zinc	mg/kg dry wt	0.05	78.4	80.4	164	84.5	278

Heavy Metals in Soil

Client Sample ID			TP11 0.1	TP12 0.1	TP12 0.8	TP13 0.1	TP14 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-16	24-24800-19	24-24800-20	24-24800-21	24-24800-25
Arsenic	mg/kg dry wt	0.125	16.7	5.5	12	3.6	5.7
Cadmium	mg/kg dry wt	0.005	0.614	0.081	0.13	1.39	0.051
Chromium	mg/kg dry wt	0.125	26.4	19.9	21.1	16.6	19.6
Copper	mg/kg dry wt	0.075	46.5	10.3	19.2	17.4	12.4
Lead	mg/kg dry wt	0.25	1,660	39.8	87.7	101	34.0
Nickel	mg/kg dry wt	0.05	13.7	13.3	14.8	10.7	13.6
Zinc	mg/kg dry wt	0.05	1,030	98.1	135	2,550	121

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation with the exception of tests marked *, which are not accredited.
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Heavy Metals in Soil

Client Sample ID			TP15 0.1	TP16 0	TP16 1.5	TP17 0.35	TP18 0.4
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-28	24-24800-29	24-24800-32	24-24800-34	24-24800-38
Arsenic	mg/kg dry wt	0.125	6.1	5.9	4.3	4.9	9.9
Cadmium	mg/kg dry wt	0.005	0.44	0.22	0.033	0.037	0.093
Chromium	mg/kg dry wt	0.125	31.0	28.2	18.7	19.9	16.9
Copper	mg/kg dry wt	0.075	17.8	26.7	10.7	6.7	61.0
Lead	mg/kg dry wt	0.25	211	264	17.5	28.7	314
Nickel	mg/kg dry wt	0.05	13.7	15.1	15.8	13.7	15.9
Zinc	mg/kg dry wt	0.05	865	231	49.7	113	133

Heavy Metals in Soil

Client Sample ID			TP19 0.1	TP19 1.3	TP20 0.1	TP21 0.1	TP21 1.2
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-41	24-24800-43	24-24800-45	24-24800-48	24-24800-50
Arsenic	mg/kg dry wt	0.125	3.4	5.3	4.8	6.3	4.9
Cadmium	mg/kg dry wt	0.005	0.054	0.029	0.071	0.10	0.030
Chromium	mg/kg dry wt	0.125	25.2	18.9	21.3	18.5	17.5
Copper	mg/kg dry wt	0.075	9.35	12.1	13.6	10.4	11.7
Lead	mg/kg dry wt	0.25	16.8	17.8	27.3	21.1	17.3
Nickel	mg/kg dry wt	0.05	13.4	15.9	14.7	12.1	15.5
Zinc	mg/kg dry wt	0.05	66.4	51.0	145	82.2	50.1

Heavy Metals in Soil

Client Sample ID			TP22 0.1
Date Sampled			5/08/2024
Analyte	Unit	Reporting Limit	24-24800-51
Arsenic	mg/kg dry wt	0.125	4.2
Cadmium	mg/kg dry wt	0.005	0.088
Chromium	mg/kg dry wt	0.125	16.6
Copper	mg/kg dry wt	0.075	10.5
Lead	mg/kg dry wt	0.25	25.3
Nickel	mg/kg dry wt	0.05	11.8
Zinc	mg/kg dry wt	0.05	74.3

Organochlorine Pesticides - Soil

Client Sample ID			TP13 0.1	TP20 0.1	TP21 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-21	24-24800-45	24-24800-48
TCMX (Surrogate)	%	1	100	100	110
2,4'-DDD	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
2,4'-DDE	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
2,4'-DDT	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
4,4'-DDD	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
4,4'-DDE	mg/kg dry wt	0.01	0.052	<0.010	0.099
4,4'-DDT	mg/kg dry wt	0.01	<0.010	<0.010	0.015
alpha-BHC	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Aldrin	mg/kg dry wt	0.01	<0.010	<0.010	<0.010

Organochlorine Pesticides - Soil

Client Sample ID			TP13 0.1	TP20 0.1	TP21 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024
beta-BHC	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
cis-Chlordane	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Chlordane (sum)	mg/kg dry wt	0.02	<0.020	<0.020	<0.020
cis-Nonachlor	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
delta-BHC	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Total DDT	mg/kg dry wt	0.02	0.0500	<0.0200	0.110
Dieldrin	mg/kg dry wt	0.05	<0.050	<0.050	<0.050
Endosulfan I	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Endosulfan II	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Endosulfan sulfate	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Endrin	mg/kg dry wt	0.05	<0.050	<0.050	<0.050
Endrin aldehyde	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Endrin ketone	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
gamma-BHC	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Heptachlor	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Heptachlor epoxide	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Hexachlorobenzene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
Methoxychlor	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
trans-nonachlor	mg/kg dry wt	0.01	<0.010	<0.010	<0.010
trans-Chlordane	mg/kg dry wt	0.01	<0.010	<0.010	<0.010

PAH in Soil (Routine)

Client Sample ID			TP1 0.1	TP2 0.1	TP9 0.1	TP9 0.7	TP10 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-1	24-24800-5	24-24800-9	24-24800-11	24-24800-13
1-Methylnaphthalene	mg/kg dry wt	0.01	0.024	<0.010	0.042	<0.010	<0.010
2-Methylnaphthalene	mg/kg dry wt	0.01	0.024	<0.010	0.036	<0.010	0.011
Acenaphthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthylene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Benz[a]anthracene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[a]pyrene	mg/kg dry wt	0.01	0.016	<0.010	<0.010	<0.010	0.013
Benzo[b]&[j]fluoranthene	mg/kg dry wt	0.02	0.029	<0.020	<0.020	<0.020	0.022
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[k]fluoranthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	mg/kg dry wt	0.01	0.026	<0.010	0.017	<0.010	0.020
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoranthene	mg/kg dry wt	0.02	0.029	<0.020	<0.020	<0.020	0.022
Fluorene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	0.018	<0.010	0.012	<0.010	0.014
Naphthalene	mg/kg dry wt	0.01	0.011	<0.010	0.019	<0.010	<0.010
Phenanthrene	mg/kg dry wt	0.01	0.032	0.010	0.026	<0.010	0.014
Pyrene	mg/kg dry wt	0.02	0.030	<0.020	<0.020	<0.020	0.022
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.030	0.030	0.030	0.030	0.030
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	0.020	<0.010	<0.010	<0.010	0.020
Anthracene-d10 (Surrogate)	%	1	110	110	110	120	110

PAH in Soil (Routine)

Client Sample ID			TP11 0.1	TP12 0.1	TP12 0.8	TP13 0.1	TP14 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-16	24-24800-19	24-24800-20	24-24800-21	24-24800-25
1-Methylnaphthalene	mg/kg dry wt	0.01	0.020	<0.010	0.056	<0.010	<0.010
2-Methylnaphthalene	mg/kg dry wt	0.01	0.021	0.014	0.057	0.021	<0.010
Acenaphthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	0.012	<0.010
Acenaphthylene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	0.57	<0.010
Anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	0.51	<0.010
Benz[a]anthracene	mg/kg dry wt	0.02	0.021	<0.020	0.031	0.17	<0.020
Benzo[a]pyrene	mg/kg dry wt	0.01	0.027	0.020	0.034	0.32	0.021
Benzo[b]&[j]fluoranthene	mg/kg dry wt	0.02	0.039	0.025	0.046	1.0	0.024
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	0.029	<0.020	0.025	0.66	0.021
Benzo[k]fluoranthene	mg/kg dry wt	0.01	0.012	<0.010	0.015	0.23	<0.010
Chrysene	mg/kg dry wt	0.01	0.030	0.022	0.046	0.57	0.015
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	0.16	<0.010
Fluoranthene	mg/kg dry wt	0.02	0.045	0.034	0.042	0.40	<0.020
Fluorene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	0.027	0.017	0.027	0.63	0.022
Naphthalene	mg/kg dry wt	0.01	0.013	<0.010	0.034	0.013	<0.010
Phenanthrene	mg/kg dry wt	0.01	0.029	0.022	0.061	0.082	<0.010
Pyrene	mg/kg dry wt	0.02	0.047	0.034	0.058	0.73	0.022
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.050	0.040	0.060	0.69	0.040
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	0.040	0.020	0.050	0.69	0.030
Anthracene-d10 (Surrogate)	%	1	110	110	110	110	110

PAH in Soil (Routine)

Client Sample ID			TP15 0.1	TP16 0	TP16 1.5	TP17 0.35	TP18 0.4
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-28	24-24800-29	24-24800-32	24-24800-34	24-24800-38
1-Methylnaphthalene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	0.027	0.12
2-Methylnaphthalene	mg/kg dry wt	0.01	<0.010	0.010	<0.010	0.025	0.12
Acenaphthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthylene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	0.011
Anthracene	mg/kg dry wt	0.01	<0.010	0.024	<0.010	<0.010	0.018
Benz[a]anthracene	mg/kg dry wt	0.02	<0.020	0.082	<0.020	<0.020	0.11
Benzo[a]pyrene	mg/kg dry wt	0.01	0.027	0.096	<0.010	<0.010	0.14
Benzo[b]&[j]fluoranthene	mg/kg dry wt	0.02	0.040	0.12	<0.020	<0.020	0.17
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	0.026	0.069	<0.020	<0.020	0.10
Benzo[k]fluoranthene	mg/kg dry wt	0.01	<0.010	0.038	<0.010	<0.010	0.055
Chrysene	mg/kg dry wt	0.01	0.079	0.10	<0.010	<0.010	0.14
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.010	0.020	<0.010	<0.010	0.034
Fluoranthene	mg/kg dry wt	0.02	<0.020	0.15	<0.020	<0.020	0.13
Fluorene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	0.012	0.068	<0.010	<0.010	0.11
Naphthalene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	0.074
Phenanthrene	mg/kg dry wt	0.01	<0.010	0.094	<0.010	0.023	0.11
Pyrene	mg/kg dry wt	0.02	0.043	0.15	<0.020	<0.020	0.13
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.050	0.15	0.030	0.030	0.22

PAH in Soil (Routine)

Client Sample ID			TP15 0.1	TP16 0	TP16 1.5	TP17 0.35	TP18 0.4
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	0.030	0.15	<0.010	<0.010	0.22
Anthracene-d10 (Surrogate)	%	1	110	110	130	110	110

PAH in Soil (Routine)

Client Sample ID			TP19 0.1	TP19 1.3	TP20 0.1	TP21 0.1	TP21 1.2
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-41	24-24800-43	24-24800-45	24-24800-48	24-24800-50
1-Methylnaphthalene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthylene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Benz[a]anthracene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[a]pyrene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo[b]&[j] fluoranthene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[k]fluoranthene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	mg/kg dry wt	0.01	<0.010	<0.010	0.019	<0.010	<0.010
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoranthene	mg/kg dry wt	0.02	<0.020	<0.020	0.025	<0.020	<0.020
Fluorene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/kg dry wt	0.01	<0.010	<0.010	0.013	0.019	<0.010
Pyrene	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.030	0.030	0.030	0.030	0.030
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene-d10 (Surrogate)	%	1	110	130	120	110	120

PAH in Soil (Routine)

Client Sample ID			TP22 0.1
Date Sampled			5/08/2024
Analyte	Unit	Reporting Limit	24-24800-51
1-Methylnaphthalene	mg/kg dry wt	0.01	<0.010
2-Methylnaphthalene	mg/kg dry wt	0.01	<0.010
Acenaphthene	mg/kg dry wt	0.01	<0.010
Acenaphthylene	mg/kg dry wt	0.01	<0.010
Anthracene	mg/kg dry wt	0.01	<0.010
Benz[a]anthracene	mg/kg dry wt	0.02	<0.020
Benzo[a]pyrene	mg/kg dry wt	0.01	<0.010
Benzo[b]&[j] fluoranthene	mg/kg dry wt	0.02	<0.020
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	<0.020
Benzo[k]fluoranthene	mg/kg dry wt	0.01	<0.010
Chrysene	mg/kg dry wt	0.01	<0.010

PAH in Soil (Routine)

Client Sample ID			TP22 0.1
Date Sampled			5/08/2024
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.010
Fluoranthene	mg/kg dry wt	0.02	<0.020
Fluorene	mg/kg dry wt	0.01	<0.010
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	<0.010
Naphthalene	mg/kg dry wt	0.01	<0.010
Phenanthrene	mg/kg dry wt	0.01	<0.010
Pyrene	mg/kg dry wt	0.02	<0.020
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.030
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	<0.010
Anthracene-d10 (Surrogate)	%	1	110

Total Petroleum Hydrocarbons - Soil

Client Sample ID			TP1 0.1	TP18 0.4
Date Sampled			5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-1	24-24800-38
C7-C9	mg/kg dry wt	10	<10	<10
C10-C14	mg/kg dry wt	15	<15	<15
C15-C36	mg/kg dry wt	25	117	58
C7-C36 (Total)	mg/kg dry wt	50	117	58

Moisture Content

Client Sample ID			TP1 0.1	TP2 0.1	TP9 0.1	TP9 0.7	TP10 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-1	24-24800-5	24-24800-9	24-24800-11	24-24800-13
Moisture Content	%	1	27	22	23	15	20

Moisture Content

Client Sample ID			TP11 0.1	TP12 0.1	TP12 0.8	TP13 0.1	TP14 0.1
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-16	24-24800-19	24-24800-20	24-24800-21	24-24800-25
Moisture Content	%	1	19	15	10	33	8

Moisture Content

Client Sample ID			TP15 0.1	TP16 0	TP16 1.5	TP17 0.35	TP18 0.4
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-28	24-24800-29	24-24800-32	24-24800-34	24-24800-38
Moisture Content	%	1	15	13	7	16	19

Moisture Content

Client Sample ID			TP19 0.1	TP19 1.3	TP20 0.1	TP21 0.1	TP21 1.2
Date Sampled			5/08/2024	5/08/2024	5/08/2024	5/08/2024	5/08/2024
Analyte	Unit	Reporting Limit	24-24800-41	24-24800-43	24-24800-45	24-24800-48	24-24800-50
Moisture Content	%	1	15	8	17	24	6

Moisture Content

Client Sample ID			TP22 0.1
Date Sampled			5/08/2024
Analyte	Unit	Reporting Limit	24-24800-51
Moisture Content	%	1	31

Method Summary

- Elements in 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.
- OCP in Soil

Samples are extracted with hexane, pre-concetrated then analysed by GC-MSMS. (Chlordane (sum) is calculated from the main actives in technical Chlordane: Chlordane, Nonachlor and Heptachlor). (In accordance with in-house procedure).
- Total DDT

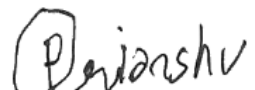
Sum of DDT, DDD and DDE (4,4' and 2,4 isomers)
- PAH in Soil

Solvent extraction, silica cleanup, followed by GC-MS analysis.
Benzo[a]pyrene TEQ (LOR): The most conservative TEQ estimate, where a result is reported as less than the limit of reporting (LOR) the LOR value is used to calculate the TEQ for that PAH.
Benzo[a]pyrene TEQ (Zero): The least conservative TEQ estimate, PAHs reported as less than the limit of reporting (LOR) are not included in the TEQ calculation.
Benzo[a]pyrene toxic equivalence (TEQ) is calculated according to '*Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health*'. Ministry for the Environment. 2011. (In accordance with in-house procedure).
- TPH in Soil

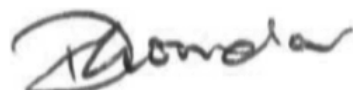
Solvent extraction, silica cleanup, followed by GC-FID analysis. (C7-C36). (In accordance with in-house procedure based on US EPA 8015).
- Moisture

Moisture content is determined gravimetrically by drying at 103 °C.


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