



Clyde Orchards

1043 Earnscleugh Road, Alexandra

Preliminary Site Investigation

18-05-2026

NZ0071619.5253-CLM-RPT-001





Document distribution

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Prepared for

Clyde Orchards

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Executive summary

WSP New Zealand Limited (WSP) was engaged by Clyde Orchards to undertake a Preliminary Site Investigation (PSI) as part of the proposed construction of a new dwelling at 1043 Earnsclough Road ('the lot'). It is understood that the existing lot will be subdivided into two separate sections known as Lot 1 and Lot 2, with construction of a new residential dwelling planned for Lot 2 – located at the lots eastern end ('the site'). Works will include the construction of a new building platform along with a 161 m² dwelling within the newly established 22,600 m² lot, as shown on the survey development plans presented in Appendix A. As the site is currently classified under a nursery/orchard status, a land use change will also be required to enable the residential development.

The PSI is being undertaken to determine whether the proposed residential subdivision and dwelling trigger consent requirements, and if so, whether contaminants associated with historic HAIL activities pose a potential risk to human health within the proposed building platform / site. As such, preparation of this PSI and consideration of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) (MfE, 2011a) is required.

The objectives of the PSI are to:

- Identify whether it is more likely than not that an activity or industry described in the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) (MfE, 2011b) is being or has been undertaken on the site.
- Assess whether the MfE NESCS applies to the site.
- Inform the nature and extent of further intrusive investigation and management controls, if required.

This PSI has been prepared in general accordance with the MfE *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand* (CLMG No. 1) (MfE, 2021a).

The PSI included a desktop review of historical records, aerial imagery, Council HAIL data, geological and hydrogeological information, and relevant previous reports. The review confirmed that the Site itself is not recorded as a verified HAIL site, however historical and current land use is consistent with surrounding horticultural activities. These activities are classified under HAIL Category A10 (persistent pesticide use) and have been undertaken both on-site and across adjacent properties. In addition, HAIL Category A17 (storage tanks for fuel or chemicals) is associated with the presence of above-ground fuel storage tanks on the western portion of the current lot.

Historical aerial imagery and previous investigations confirm that the Site has been predominantly used for stone fruit cultivation since at least the 1970s, with irrigation infrastructure and agrichemical use supporting these activities. While pesticide use was confirmed to have occurred on-site, no specific evidence of bulk storage or disposal practices likely to result in widespread contamination was identified.

A preliminary conceptual site model identified historical horticultural activities as the primary potential source of contamination, with shallow soils identified as the potentially impacted media. Potential contaminants of concern include trace metals and organochlorine pesticides associated with orchard



spraying. Relevant exposure pathways include direct contact, ingestion, and inhalation of soils during construction works, as well as future residential use.

Limited soil sampling undertaken as part of the PSI did not identify any contaminants of concern exceeding relevant human health criteria. Elevated concentrations of copper and locally lead above background levels were identified, which are consistent with historical horticultural practices and do not indicate unacceptable risk.

Based on the findings of the PSI, while HAIL activities are present, the Site does not present a material contamination risk to human health under the proposed residential land use. The NESCS applies due to the presence of HAIL activities and the proposed change in land use however, given contaminants did not exceed the applicable standard, the Site is considered suitable for the intended development. Further investigation or soil management controls are not considered necessary at this stage, provided standard good practice measures are implemented during construction.

1. Introduction

1.1 Project background

WSP New Zealand Limited (WSP) was engaged by Clyde Orchards to undertake a Preliminary Site Investigation (PSI) as part of the proposed construction of a new dwelling at 1043 Earnsclough Road ('the lot'). It is understood that the existing lot will be subdivided into two separate sections known as Lot 1 and Lot 2, with construction of a new residential dwelling planned for Lot 2 – located at the lots eastern end ('the site'). Works will include the construction of a new building platform along with a 161 m² dwelling within the newly established 22,600 m² lot, as shown on the survey development plans presented in Appendix A. As the site is currently classified under a nursery/orchard status, a land use change will also be required to enable the residential development.

The PSI is being undertaken to determine whether the proposed residential subdivision and dwelling trigger consent requirements, and if so, whether contaminants associated with historic HAIL activities pose a potential risk to human health within the proposed building platform / site. As such, preparation of this PSI and consideration of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCSC) (MfE, 2011a) is required.

1.2 Objective

The objectives of the PSI are to:

- Identify whether it is more likely than not that an activity or industry described in the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) (MfE, 2011b) is being or has been undertaken on the site.
- Assess whether the MfE NESCSC applies to the site.
- Inform the nature and extent of further intrusive investigation and management controls, if required.

This PSI has been prepared in general accordance with the MfE *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand* (CLMG No. 1) (MfE, 2021a).

1.3 Scope of work

To achieve the objectives of the PSI, WSP undertook the following scope of works:

- A desktop review of publicly available information including:
 - Historical aerial photographs available on Retrolens and Google Earth.
 - The Otago Regional Council (ORC) Selected Land Use Sites (SLUS) Site database (Otago Regional Council, 2026)
 - Topography, geology and hydrology/hydrogeology information.

- Any additional property information able to be sourced.
- Preparation of this PSI report in accordance with CLMG No. 1, presenting the findings of the investigation and recommendations for further investigation if required (MfE, 2021a).

1.4 Certifying statement

WSP confirms that:

- This PSI meets the requirements of the NESCS because it has been:
 - Reported on in accordance with the current edition of the CLMG No. 1 (MfE, 2021a), and
 - The report has been reviewed and approved by a Suitably Qualified and Experienced Practitioner (SQEP)

Evidence of the qualifications and experience of the SQEP who completed this investigation and certified this report is available on request. The author and SQEP details are provided in Table 1.1 below.

Table 1.1: Suitably Qualified and Experienced Practitioner Details

ITEM	DETAILS
Author	
Name	Eilish Kerwin
Job title	Environmental Scientist
Years' industry experience	4.5
SQEP/Certifier	
Name	Lisa Bond CEnvP SC
Job title	Technical Principal – Contaminated Land
Years' industry experience	25

2. Site and environmental setting

2.1 Site identification

The lot is located in the Earnsclough settlement of Central Otago. It currently contains a main dwelling with a bunded dam located at the western end, near the entrance to the property. To the rear of the existing dwelling is productive land that has intermittently been used for stone fruit horticultural growing practices. It is situated amongst a rural resource area, with surrounding properties largely comprising of horticultural growing activities or open grassland areas.

Site identification details are provided in Table 2.1 with site layout shown on Figure 1.

Table 2.1: Site Identification Details

DESCRIPTION	SITE INFORMATION
Street Address	1043 Earnsclough Road
Legal Description	SEC 183 BLK X LEANING ROCK SD
Current Site Area	3.06 Ha
Proposed Subdivision Lot Areas	Lot 1: 2.16 Ha Lot 2: 2.26 Ha
Approximate Development Area (Lot 2)	Building platform: 900 m ² Proposed dwelling: 161 m ²
Local Authority	Otago Regional Council Central Otago District Council
Current Land Use	Dwelling with horticultural growing area
Future Land Use	Lot 1: Residential dwelling with horticultural growing area Lot 2: Residential dwelling

2.2 Environmental setting

2.2.1 Geology

The Institute of Geological and Nuclear Sciences 1:250,000 Geology Map (Edbrooke et.al, 2020) identifies that the lot lies atop of a geological boundary – with the western half of the property underlain by Late Pleistocene river deposits described as unweathered to slightly weathered, loose, sandy to silty, well rounded gravel usually on large outwash plains. The eastern half of the lot is similarly underlain by Late Pleistocene river deposits, however the material is described as generally unweathered, well sorted, loose, sandy to bouldery gravel forming large terraces and outwash plains.

The New Zealand Geotechnical Database (NZGD) is an online resource developed by the Ministry of Business, Innovation and Employment (MBIE) which maps existing ground information across New Zealand (NZGD, 2026). A review of the NZGD indicated no historical investigations located within 150 metres (m) of the lot.

2.2.2 Topography

The lot sits at an elevation of circa 170m above mean sea level (amsl) and is relatively flat as a result of its location atop a river terrace of the nearby Clutha River. Elevation gradually decreases to the east, towards the Clutha River, with the eastern boundary of the site sitting at an elevation of approximately 167m amsl (Topographic New Zealand, 2026).

2.2.3 Surface water

The closest surface water body is the Clutha River, located approximately 190 m east of the site's eastern boundary. An unnamed drain is also present in the western end of proposed Lot 1 and appears to drain from the on-site dam to the south and assumed to be associated with the Earnsclough Irrigation Company network. An on-site dam is also noted to be present on the lot, which is approximately 7,275.80m² in size and presumed to have acted as a water source for the horticultural activities previously undertaken at the property. It is understood that this dam is fed from the water race to the east which forms part of the Earnsclough Irrigation Company network.

An ephemeral drain/waterway is located alongside the northern boundary of the site which acts as a drainage channel for overflow/ runoff from the Picnic Creek to the west towards the Clutha River.

Based on the known geology of the area, topography and river terrace setting, any surface water at the site is highly unlikely to pond in significant quantities for prolonged periods. The site is generally flat with a gentle fall towards the east which would promote lateral surface runoff rather than localised areas of ponding. Underlying geology of terrace deposits typically comprises of well-draining alluvial gravels which allow infiltration and limits the persistence of surface water.

2.2.4 Groundwater

The Earth Sciences New Zealand GNS 'Depth to Groundwater' layer indicates that groundwater is present at shallow depths beneath the lot of between 10 – 20 metres below ground level (m bgl) (ESNZ, 2026).

The ORC Regional Maps GIS resource indicates that the lot is underlain by the Earnsclough Terrace Aquifer. Groundwater levels within this aquifer are typically several metres below ground level and are deeper toward the Clutha River as a result of the areas terrace setting. Recharge to the aquifer is dominated by losses from surface water features (notably the Fraser River) and irrigation-related seepage, while direct rainfall recharge is relatively minor due to the semi-arid climate. The Wells Otago online database denotes the presence of four groundwater monitoring wells within 250m of the site. Of these, two are listed as having a domestic primary use, with one listed to be in use for groundwater monitoring and one having an unknown use. The presence of domestic wells within 250 m indicates that groundwater in the Earnsclough Terrace Aquifer is utilised locally as a potable supply, representing a potentially sensitive human receptor. The presence of a monitoring well also indicates that groundwater levels and/or quality have been subject to observation in the area, providing potential context for hydrogeological conditions.

A review of Wells Otago website (ORC, 2026), indicates that there are four groundwater bores within 250m of the site boundary. Three of these bores are utilised for domestic use with depths ranging between 23m and 30m below ground level.

3. Desktop assessment

3.1 Historical information and aerial imagery review

In order to complete the desktop review of the Site, WSP reviewed historical aerial photography, Council held consents and the ORC SLUS to date. Sections 3.2 – 3.6 detail pertinent information with regard to contaminated land.

3.2 Historical aerial photographs

WSP reviewed available historical aerial photographs sourced from Retrolens (Retrolens, 2025) and Google Earth Pro (GoogleEarth, 2025). A summary of observations is provided in Table 3.1 with aerial photographs provided in Appendix A.

Table 3.1: Summary of Historical Aerial Photography Review

YEAR	LOT OBSERVATIONS	SURROUNDING ENVIRONMENT
1958	The property is undeveloped and appears to be in pastoral grassland. An area of raised elevation / potential disturbance is noted at the eastern end of the site. A small structure assumed to be the original cottage is present at the western end.	An extensive growing activity is located to the north and west of the site. Earnsclough Road is developed and operational and areas to the south are largely undeveloped.
1968	Minimal changes from 1958 imagery.	
1976	By 1976 imagery, the water dam has been constructed, and the majority of the site is planted in horticultural crops.	The horticultural activity located north / west of the site decreases slightly in size.
1982	Minimal changes to the lot and surrounding area from 1976 imagery.	A new roadway is noted on the crown land located to the east of the sites eastern boundary.
1985	Some potential soil disturbance is noted in the east of the site at Lot 1, in front of the original cottage.	New planting occurs at the horticultural activity located to the north / west of the site. A small additional water dam is noted to the south of the sites southern boundary.
2005	Minimal changes from 1985 imagery.	New dwellings have been constructed south of the sites southern boundary. New growing activities are established to the south and south west of the site.
2007	Minimal changes to the site and surrounding area from 2005 imagery.	
2011	Vegetation is removed from the sites eastern boundary.	New dwellings are constructed just north of the sites northern boundary following the removal of the horticultural activity. Larking Way, Paulin Way and Jennings Way are developed. Some

YEAR	LOT OBSERVATIONS	SURROUNDING ENVIRONMENT
		vegetation is removed from the sites boundary with the former horticultural activity to the north.
2015	Minimal changes from 2011 imagery.	Dwellings are erected in the subdivision north of the site.
2017	The main existing dwelling currently present at Lot 1 has been constructed by 2017 imagery. The constructed has included the development of a new driveway and parking area.	A new dwelling is constructed in the subdivision north of the site.
2021	Horticultural plantations in the area surrounding the proposed dwelling footprint are removed.	The horticultural activity to the west of the site reduces in size and new dwellings are constructed in the subdivision north of the site.
2026	The small original cottage at Lot 1 has been demolished by the latest 2026 imagery.	A new growing activity is established south of the site.

3.3 Consents

Consents in the Otago region were analysed on the ORC GIS database which visually depicts the location and nature of active consents.

The platform indicated that there are no consents registered the site itself or within a 200m radius of the lot.

Reports relating to the proposed works provided to WSP provide current consent information which is presented below:

Table 3.2 Existing and Lodged Consents

CONSENT NO.	STATUS	NOTES
RC220142	Previously granted – to be suspended	A resource consent was previously granted to allow a second dwelling on the existing title, located closer to Earnsclough Road.
Unallocated	Lodged	A non-operative lodged consent exists relating to the subdivision of the lot into Sections 183 and 184, with lot 1 retaining the existing dwelling and lot 2 allocated to the new dwelling. This is classified as a non-complying activity.
Unallocated	Lodged	A second non-operative lodged consent exists relating to the construction of a 30 m X 30 m building platform on the proposed lot 2. This is classified as a restricted discretionary activity.

3.4 Listed land use register

The MfE Hazardous Activities and Industries List (HAIL) (MfE, 2011b) is a compilation of activities and industries that have been identified to have contamination potential to soils or groundwater as a result of hazardous substance use, storage or disposal. The HAIL is used in the determination of a 'piece of land' which is defined by the following under the NESCS:

- An activity or industry described in the HAIL is being undertaken on it:
- An activity or industry described in the HAIL has been undertaken on it:

ORC manages a Selected Land Use Site Database which maps verified HAIL activities in the region. The resource notes that the Site itself is not classified as a verified HAIL site, however, is adjacent to numerous HAIL sites as a result of neighbouring horticultural activities (refer to Figure 2).

3.5 Previous investigations

Historical investigations available to WSP for review at time of issue have been summarised below.

Preliminary Site Investigation – OPUS (now WSP), 2015

OPUS undertook a preliminary site investigation for the property at 1043 Earnsclough Road to assess for the requirement of a consent in relation to provisions of the NESCS. The report noted that in 2015, the majority of the lot was populated in stone fruit trees. An on-site walkover and inspection noted the presence of two above ground storage tanks, one of which showed evidence of small-scale spillages. The walkover also noted the presence of a concrete foundation shed housing pesticides for use on the orchard, with the property owner noting that regular spraying of the fruit trees does occur (OPUS, 2015).

Paulin Studio – Resource Consent Application, 2026

A resource consent application was prepared earlier in 2026 in relation to the proposed development of the new residential dwelling. It outlines that the applicants seek to subdivide the property into two allotments of Lot 1 and Lot 2, with Lot 2 being sold to immediate family members (Paulin Studios, 2026a).

Paulin Studio – Assessment of Effects on the Environment, 2026

Paulin Studio completed an AEE for the proposed redevelopment of the site in January of 2026. It notes that the previous consent relating to the existing dwelling will be surrendered as part of the works. Earthworks quantities are stated to be localised and small scale and relate to the construction of the building platform, driveway / access areas and service trenches. The surrounding land use comprises orchards and rural residential properties of similar scale, with no identified industrial or commercial land uses in the immediate vicinity. The AEE identifies no known soil or contamination hazards associated with the proposed development (Paulin Studio, 2026b).

3.6 Identified HAIL Activities

The desktop review identified several HAIL activities associated with the Site or adjacent to. Table 3.3 below details activities or industries identified.

Table 3.3: Identified HAIL Activities

HAIL ACTIVITY CODE	HAIL DESCRIPTION	DISTANCE FROM SITE	POTENTIAL CONTAMINANTS OF CONCERN	LIKELIHOOD OF RISK	COMMENTS & JUSTIFICATION
A10	Persistent pesticide bulk storage or use, including sport turfs, market gardens, orchards, glass houses or spray sheds	Onsite and surrounding adjacent lots	— Heavy metals — Organochlorines	Possible	A site walkover undertaken by OPUS (now WSP) confirmed the presence of pesticides on the lot, which were confirmed by the owner to be regularly applied to the fruit trees. It was stated that spraying occurred annually. Additionally, the surrounding area has consistently been populated with horticultural plantings from the earliest historical imagery in 1958. Given the relatively flat topography, migration of contaminants of concern to the site from neighbouring properties and previous land use, it is possible that the persistent application of pesticides may have impacted soils.
A17	Storage tanks or drums for fuel, chemicals or liquid waste	On lot, ~250 m from site	— Heavy metals — Hydrocarbons	Unlikely	Two above-ground fuel storage tanks are present on the western side of the lot in association with irrigation pumping infrastructure. A site inspection identified evidence of minor, localised spillages adjacent to one of these tanks, however no widespread staining or off-site migration was observed. The storage tanks are located away from the proposed building platform, and any historic spillages are considered likely to be limited in extent and confined to the immediate vicinity of the tanks. The PSI concluded that potential risks associated with hydrocarbons from these tanks are low to medium and can be adequately managed. Based on the limited scale of observed impacts, separation from the proposed residential development area, and the absence of analytical evidence indicating broader contamination, it is considered unlikely that the on-site fuel storage tanks have caused significant soil contamination affecting the proposed development area.

4. Conceptual site model

Using the information gained through the desktop review process a preliminary conceptual site model (CSM) has been prepared for the Site, refer to Table 4.1.

A CSM is used to identify potential source-pathway-receptor links with regard to the contamination of soil and ground and/or surface waters including the production or release of vapours/gases.

Table 4.1: Preliminary Conceptual Site Model

Likely sources of impact	— The presence of a stone fruit orchard leading to the application of pesticides — Nearby / adjacent horticultural activities likely leading to pesticide application — Presence of two above ground storage tanks on the lot
Potentially impacted media	Impacted media is likely to be shallow soils (<1.0 m bgl)
Contaminants of concern	The identified potential contaminants of concern comprise: — Heavy metals/metalloids (arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, and zinc) — Hydrocarbons including polycyclic aromatic hydrocarbons — Organochlorines
Migration Pathways	The identified potential migration pathways for contaminants comprise: — Surface runoff containing impacted soil or dissolved contaminants — Discharge of contaminants to soil or groundwater/surface water
Potential exposure pathways	Potential exposure pathways comprise: — Inhalation of contaminated vapours — Dermal contact with contaminated soils/water — Ingestion of contaminated material
Potential sensitive receptors	Identified sensitive receptors comprise: — Site contractors and regulatory staff (during excavation and construction) — Future site users

5. Site Works

5.1 Site Walkover

A site walkover was completed by a SQEP on 1 May 2026. The proposed Lot 1 comprised a residential dwelling on its western side with a small dam which had previously been utilised for frost fighting within the orchard. To the east of the dwelling was located an apricot orchard which had recently been harvested. Trees were in good condition and contained irrigation lines at their base and frost fighting sprinklers overhead. Evidence of weed control was noted around the trunks of each tree with the grass between rows mown and short.

Lot 2 to the east comprised an open grassed paddock which still contained overhead frost sprinkler units. Trees within this lot had been removed with some area containing greener grass where additional water had been applied (presumably from irrigation lines which had not been disconnected). Most of the site comprised brown unirrigated grass and had evidence of rabbit erosion with some potholes present.

The proposed development platform was delineated by profile poles and was located on the western side of the proposed Lot 2.

To the north of proposed Lot 2 was a dry channel which ran east-west towards the Clutha River. Beyond the channel was located rural residential lots in a parkland setting. To the east of the site, the ground was undeveloped rough vegetation with rocky outcrops which dropped in elevation towards a walking/cycle trail beyond which lies the Clutha River. To the south lay further rural residential developments and paddocks with sheep. To the west of the site lies Earnsclough Road, beyond which was located horticultural land.

5.2 Preliminary Sampling

In order to quantify contaminant risk associated with near surface soils on-site, limited soil sampling was undertaken by a SQEP on 1 May 2026. The sampling involved the collection of 5 surface soil samples from a maximum depth of 0.2 metres below ground level (m bgl). Sampling locations are presented on Figure 3.

Soil samples were sent to Hills Laboratories on 4 May 2026 with results received on 12 May 2026. As no evidence of petroleum storage had occurred on proposed Lot 2, analysis for hydrocarbons was not completed for the soils sampled. Analytical results were then compared with relevant assessment criteria in order to assess the likelihood of soil presenting a contamination risk to current and future site users. A photographic log of the site is appended to this report as Appendix B.

5.3 Soil Conditions

Soil conditions encountered across the site largely comprised of dark brown silty sand topsoils with fine to coarse gravel inclusions and rootlets. Sample HS05 noted the presence of some branch fragments with sample HS04 also containing the presence of small cobbles.

The encountered soil lithology is in line with expected geology in the area.

5.4 Adopted Guidelines

The selected guidelines have been based on the *Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011)* (CLMG No. 2) (MfE, 2011a). The *Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health* (Methodology) (MfE, 2011b) sets out a risk-based derivation methodology for health-based standards to apply to soil contaminants in New Zealand under the *Resource Management Act 1991*.

The Methodology provides a suite of numerical criteria for priority contaminants that are legally binding as gazetted under the NESCS. These numerical criteria are applied as screening criteria (Tier 1 criteria), as conservative clean-up targets to inform on-site management actions, or to trigger further investigation with a Tier 2 assessment. The Methodology utilises standardised receptors and exposure parameters to calculate soil contaminant standards (SCS) for the following five land-use scenarios:

1. Rural residential/lifestyle (25% produce)
2. Residential (10% produce)
3. High-density residential
4. Recreational
5. Commercial/industrial outdoor worker

As construction works are to take place at the Site, analytical results have been compared against the SCS for the commercial/industrial outdoor worker scenario which are applicable during development of the Site. Given the Site has historically been used for agricultural activities (stone fruit cultivation), results have also been compared against the rural residential (25% produce) SCS, as this provides a suitable and conservative proxy for potential agricultural exposure pathways. The adopted criteria are presented below in Table 6-1.

Table 6-1: Selection Criteria for Handling and Land Use Assessment

MATRIX	SOURCE GUIDELINE	LAND-USE CRITERIA
Soil for Human Health	Bioeconomy Science Institute (2025): Proposed risk-based background concentrations or soil re-use criteria for the management of contaminated land and soil relocation (Bioeconomy Science Institute, 2025)	Background and reuse criteria
	National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (Ministry for the Environment, 2021)	NES-CS and NZRB Protection of Human Health for: — Rural Residential / Lifestyle Block 25% Produce

MATRIX	SOURCE GUIDELINE	LAND-USE CRITERIA
		— Commercial/ industrial use
Soil for Disposal	National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) (NEPM) – Schedule B1	Health Investigation Levels (HILs) / Soil Guideline Values (SGVs): - Commercial / industrial (HIL D / SGV HIL D) - Supplementary to NES-CS where criteria are not available ¹
	Technical Guidelines for Disposal to land (WasteMINZ, 2023)	Class 1 – Landfill Class 2 – C&D Landfill Class 3 – Managed Fill Class 4 – Controlled Fill

¹ Applied for nickel and zinc only due to the absence of criteria in the NES-CS.

5.5 Quality Assessment and Quality Control

The field and laboratory quality assurance and quality control (QA/QC) program was based on data quality indicators (DQIs) chosen to assess the suitability of the dataset. Collection of samples was undertaken by experienced personnel following WSP standard field procedures which are based on industry accepted standard practice. A chain of custody was used to ensure the integrity of samples from collection to receipt by the laboratory. Samples were stored in chilled coolers on-Site and during transport to the laboratory. Chain of custody forms were completed on-Site and dropped off with the samples. Chain of custody forms are presented with laboratory reports in Appendix C, and include the sampler's name, date of sampling, sample matrix, sample containers and preservation used, and analysis requested. The laboratory confirmed receipt of the samples and specified the condition on delivery and the scheduled analyses.

Relative Percent Difference (RPD) has been used to assess the consistency and precision between duplicate or repeat samples. RPD provides a measure of variability between paired results and is expressed as a percentage relative to the average concentration. Lower RPD values indicate good sample precision and analytical consistency, while higher values may reflect natural variability in the sampled media or potential sampling and analytical uncertainties. RPD results were within the data quality objectives of 50% - with the RPD table included as Table 2.

5.6 Analytical Results and Disposal

Analytical results of soil sampling indicate that no contaminants of concern were reported above the adopted human health criteria. All samples reported concentrations of copper above the relevant background concentrations for the area. As such, it can be concluded that the risk to current and future site users is low and no soil management controls are required for soil disturbance works.

All material is suitable to be reused on-site and should be where practical.

As all samples concentrations of copper exceed the background concentrations, the material cannot likely be disposed of as cleanfill. Copper concentrations in samples HS01-HS04 exceed the Class 2 C&D landfill acceptance criteria, with sample HS05 also exceeding the Class 4 controlled fill landfill acceptance criteria. As such, the material is suitable for disposal at a Class 3 managed fill facility, or at another alternative facility following providence of analytical results and confirmed acceptance.

Laboratory reports are appended to this reported as Appendix C, with tabulated analytical results also appended.

6. Updated Conceptual Site Model

Taking into consideration results of preliminary sampling and analysis for the proposed Lot 2 where development is proposed, an updated CSM has been developed as follows:

SOURCES OF CONTAMINATION	PATHWAY	RECEPTOR	LINKAGE
Heavy metals – particularly copper	Surface runoff containing impacted soil or dissolved contaminants Discharge of contaminants to soil or groundwater/surface water Dermal contact or ingestion. Inhalation of contaminated dust	Site contractors and regulatory staff (during excavation and construction) Future site users	Incomplete – All metals except copper were below background concentrations. Whilst copper was encountered above background concentrations they were below human health risk criteria for the most sensitive end use.
Organochlorine pesticides			Incomplete – No OCPs detected in soils analysed

7. Conclusions

7.1 Summary

The Site has been used historically for horticultural activities, most notably the cultivation of stone fruit across the majority of the lot since at least the 1970s. Supporting infrastructure associated with these activities, including irrigation systems, pesticide storage, and small-scale fuel storage, has been present on-site. More recently, horticultural activities have been scaled back, with areas of planting removed in advance of the proposed residential development.

The desktop assessment and historical investigations identified the following HAIL activities associated with the Site and surrounding area:

- HAIL Category A10 – Persistent pesticide use associated with orchard activities, identified on-site and across surrounding horticultural land.
- HAIL Category A17 – Storage of fuels and chemicals, associated with the presence of above-ground storage tanks on the western portion of the proposed Lot 1.

These activities were considered to present a potential for contamination of shallow soils, primarily from pesticide or fungicide application (including organochlorines and trace metals). However, the scale and nature of these activities suggest that any contamination is likely to be limited to shallow soil and localised areas.

Preliminary soil sampling undertaken across the proposed development area did not identify any contaminants of concern above relevant human health criteria. While elevated concentrations of copper above background levels were identified, these are consistent with historical horticultural practices from fungicide application and do not pose a material risk to human health under the proposed land use with the linkage between source and receptor considered incomplete.

Overall, the findings of this PSI indicate that the risk to current and future site users is low and no additional soil management controls are required.

As all samples concentrations of copper exceed the background concentrations, soils cannot be disposed of as cleanfill. Copper concentrations in samples HS01-HS04 exceed the Class 2 C&D landfill acceptance criteria, with sample HS05 also exceeding the Class 4 controlled fill landfill acceptance criteria. As such, the material is suitable for disposal at a Class 3 managed fill facility, or at another alternative facility following providence of analytical results and confirmed acceptance.

7.2 NESCS Considerations

Based on the identification of HAIL activities (primarily orchard-related pesticide use), the NESCS is applicable to the Site. In particular, the proposed subdivision and change in land use from horticultural to residential triggers the requirements of the NESCS.

Subdivision and land use consent for the site is considered to be a permitted activity under the NESCS as this PSI indicates that soil contamination risk is low and therefore it is highly unlikely that there will be a risk to human health if the activity is undertaken.

Given that preliminary sampling and analysis completed on proposed Lot 2 have not identified contaminant concentrations exceeding relevant human health criteria, the Site will not require further detailed investigation or management controls under the NESCS. Whilst this report complies with the requirements of a PSI with preliminary sampling and analysis, the findings from analytical testing are considered indicative of ground conditions across the entire Lot 2 subdivision where development is proposed based upon the consistency across the site of the previous land use, on-site observations from an SQEP and analytical results.

Any future soil disturbance associated with construction works is expected to be manageable under permitted activity provisions which would enable 1000m³ of soil disturbance without consent being required. Should ground disturbance in excess of permitted activity volumes be required, the works on site could be completed as a controlled activity providing provision of NESCS Regulation 9(1) and 9(2) are followed as contaminants of concern do not exceed their applicable standard.

7.3 Recommendations

Based on the outcomes of the PSI and supporting sampling results, no further intrusive investigation is considered necessary to support the proposed residential development.

During construction works, general good practice measures should be implemented, including:

- Management of exposed soils to minimise dust generation and potential exposure
- Appropriate handling and reuse or disposal of excavated material based on the analytical results presented
- Observational monitoring for any unexpected contamination (e.g. staining or odour) encountered during earthworks, with further assessment undertaken if required

Overall, the Site is considered suitable for the proposed residential use from a contaminated land perspective.

8. Limitations Statement

This report ('Report') has been prepared by WSP New Zealand Limited ('WSP') exclusively for Clyde Orchards ('Client'). WSP accepts no liability whatsoever for any use of or reliance on this Report, in whole or in part, by any third party.

The services undertaken by WSP in preparing this Report were strictly limited to those detailed in the Offer of Service referenced 6-XZBID.223.

The signed Short Form Agreement for Consultant Engagement dated 17 April 2026 ('Contract') and the Report itself (together, the 'Services'), and WSP's liability is limited to those specific Services.

The Services and Report are subject to the assumptions, qualifications, exclusions and limitations set out in the Contract, the Report itself and/or otherwise communicated to the Client.

Unless stated otherwise, the statements, facts, findings, opinions, conclusions, and/or recommendations in this Report ('Conclusions') are based in whole or in part on information provided by the Client and other parties ('Information'). The Information may not have been independently verified by WSP, and WSP accepts no liability for the reliability, adequacy, accuracy and completeness of the Information unless expressly stated. WSP will not be responsible for interpretations or conclusions drawn by the reader of the Report.

This document has been prepared with the assistance of Artificial Intelligence (AI) tools to support drafting, analysis, and formatting. All content developed and included in this document by WSP New Zealand Limited (WSP) has been reviewed, and validated by WSP for accuracy, appropriateness, and compliance with applicable professional standards. WSP remains responsible for the information, conclusions, and recommendations it has developed and included in this document.

At the time of preparing the Report, WSP has used reasonable care and skill to ensure that it is accurate, complete and complies with the Client's requirements in the Contract. However, future events, including without limitation, changes in policy, legislation, guidelines, scientific knowledge, and changes in interpretation of the same by statutory authorities, may affect the accuracy and completeness of the Report and it should not be relied on without further assessment and re-evaluation.

9. References

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Figures





 Level 3, 100 Beaumont St, Auckland 1010 Tel (09) 355 9500 Property of WSP NZ Ltd. All rights reserved.	Figure 2 - Adjacent HAIL Sites 1043 Earnsclough Road Preliminary Site Investigation © WSP NZ. Copyright in the drawings, information and data recorded ("the information") is the property of WSP NZ. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that which it was supplied by WSP NZ. WSP makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information. NCSI Certified Quality System to ISO 9001. © APPROVED FOR AND ON BEHALF OF WSP NZ Ltd.	Project Number: TBD Date: 29/04/2026	Author: EK Approved by: LB	Client:  Clyde Orchards CENTRAL OTAGO - NEW ZEALAND
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LEGEND

- Site Outline (Lot 2)
- Sampling Locations

Figure 3 - Sampling Locations

1043 Earnsclough Road
Preliminary Site Investigation

Project Number:	Author:	Client:
TBD	EK	Clyde Orchards
Date:	Approved by:	
1/05/2026	LB	



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LINZ, Otago Regional Council, LINZ, Stats NZ, Esri, TomTom, Garmin, MET/NASA, USGS

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Analytical Results Tables

Project Ref: 1043 Earnsclough Rd PSI

Table 1: Heavy Metals and OCP in Soil for Human Health and Disposal

Heavy Metals in Soil												OCP in Soil	
Sample Name	Sample Date	Laboratory Number	Depth (m bgl)	Arsenic	Cadmium	Chromium (VI)	Copper	Lead	Mercury	Nickel	Zinc	DDT	Dieldrin
<u>Background Concentrations⁽¹⁾</u>		<u>Gravel</u>		<u>12</u>	<u>0.6</u>	<u>120</u>	<u>80</u>	<u>150</u>	-	<u>30</u>	<u>150</u>	-	-
NESCS ² / NEPM SGV HILD ³		Rural Residential / Lifestyle Block 25% Produce		17	0.8	290	> 10,000	160	200	400	8,000	45	1.1
NESCS ² / NEPM SGV HILD ³		Commercial/industrial outdoor worker (unpaved)		70	1,300	6,300	>10,000	3,300	4,200	4,000	400,000	1000	160
Wasteminz Disposal Guidelines ⁴		Class 1 Landfill		TCLP Required									
		Class 2 C&D Landfill		20	4	20	10	20		20	20	-	-
		Class 3 Managed Fill		140	10	150	280	460		320	1200	2.0	0.10
		Class 4 Controlled Fill		17	0.8	150	220	160		35	190	2	0.1
mg/kg													
HS01	1/05/2026	4205314.1	0.0 - 0.2	7	0.10	8	<u>120</u>	13.3	< 0.10	9	56	< 0.07	< 0.012
HS02	1/05/2026	4205314.2	0.0 - 0.2	7	0.17	8	<u>178</u>	15.6	< 0.10	9	58	< 0.07	< 0.011
HS03	1/05/2026	4205314.3	0.0 - 0.2	7	0.13	8	<u>134</u>	13.2	< 0.10	9	66	< 0.07	< 0.012
HS04	1/05/2026	4205314.4	0.0 - 0.2	7	0.16	8	<u>124</u>	15.1	< 0.10	9	61	< 0.07	< 0.012
HS05	1/05/2026	4205314.5	0.0 - 0.2	7	0.24	9	<u>260</u>	142	< 0.10	12	143	< 0.07	< 0.012

Key:

<u>Black Underlined Text</u>	Exceedance of Local Background Concentrations
Bold Orange Text	Exceedance of Rural Residential / Lifestyle Block 25% Produce SCS
Bold Red Text	Exceedance of Commercial/Industrial SCS
Light Blue Fill	Exceedance of Wasteminz Class 2 C&D Disposal Guidelines
Dark Blue Fill	Exceedance of Wasteminz Class 3 Managed Fill Disposal Guidelines
Green Fill	Exceedance of Wasteminz Class 4 Controlled Fill Disposal Guidelines
Grey Text	Values reported below the laboratory limit of reporting

Adopted Guidelines:

1. Bioeconomy Science Institute: Determination and use of background concentrations of trace elements in soil in Otago and Southland (2025)
2. Ministry for the Environment, 2012. National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.
3. National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Australia); Schedule B1 (as amended May 2013) - Guideline on Investigation Levels For Soil and Groundwater, Federal Register of Legislative Instruments F2013C00288, National Environmental Protection Council. (HIL - Health Investigation Level).
4. WasteMINZ: Technical Guidelines for Disposal to Land Revision 3; October 2022

Appendix A – Historical Aerial Imagery



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	LINZ, Stats NZ, Esri, TomTom, Garmin, METI/NASA, USGS, Otago Regional Council, Vantor			Date: 29/04/2026	Approved by: LB	
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Property Boundary

Lot 2 / Site Outline

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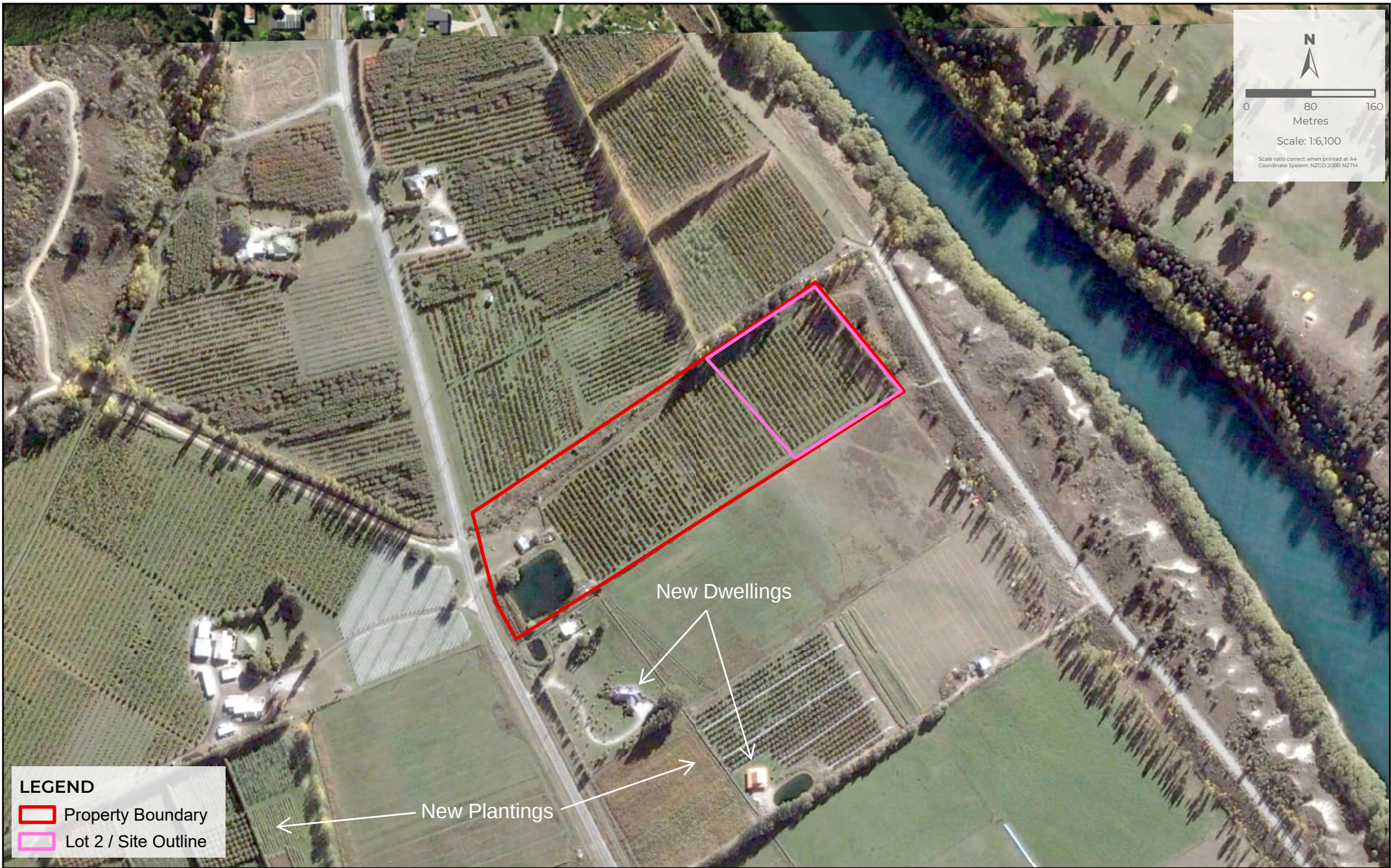
Property Boundary

Lot 2 / Site Outline

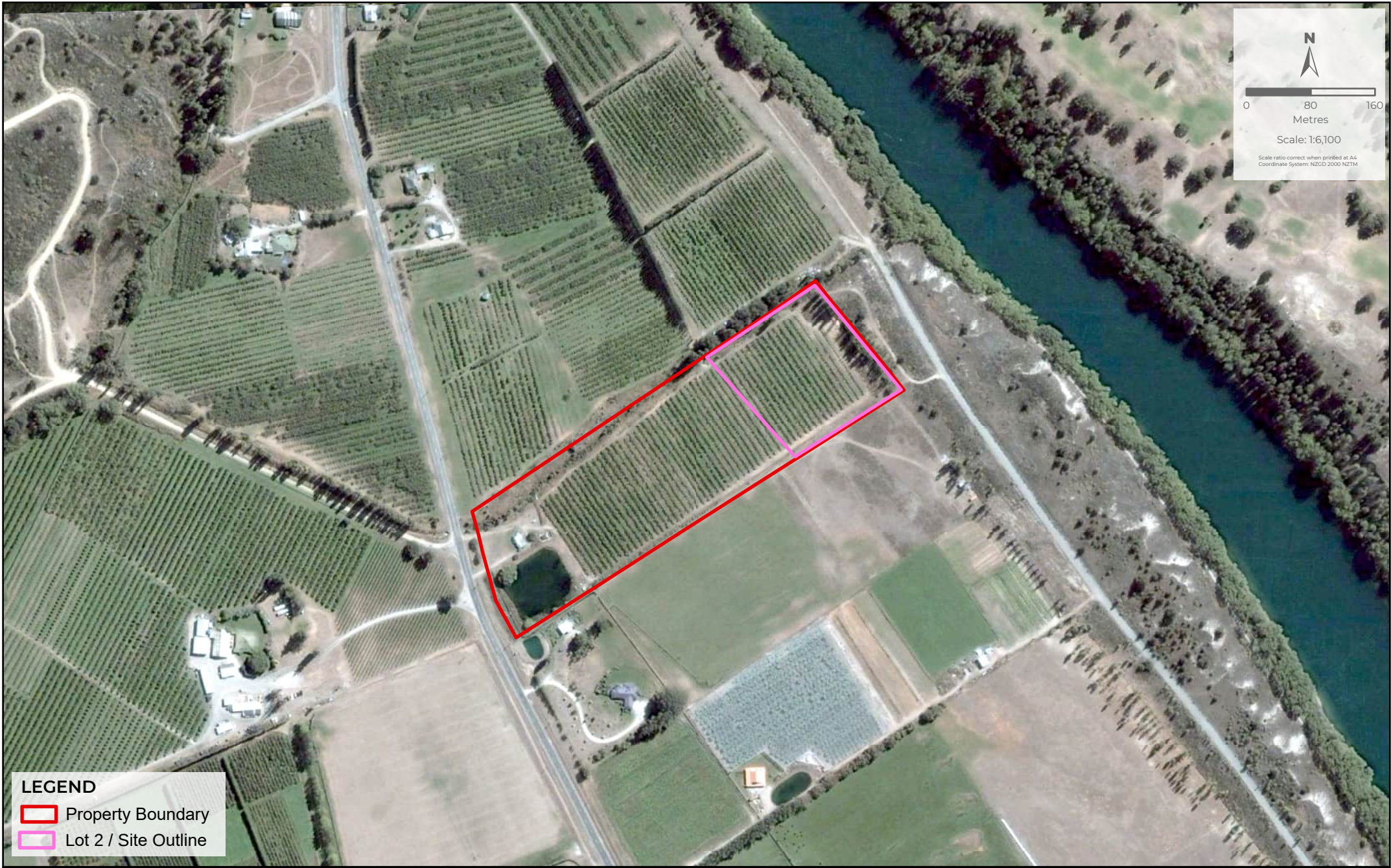
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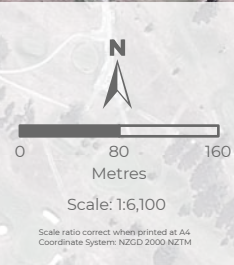
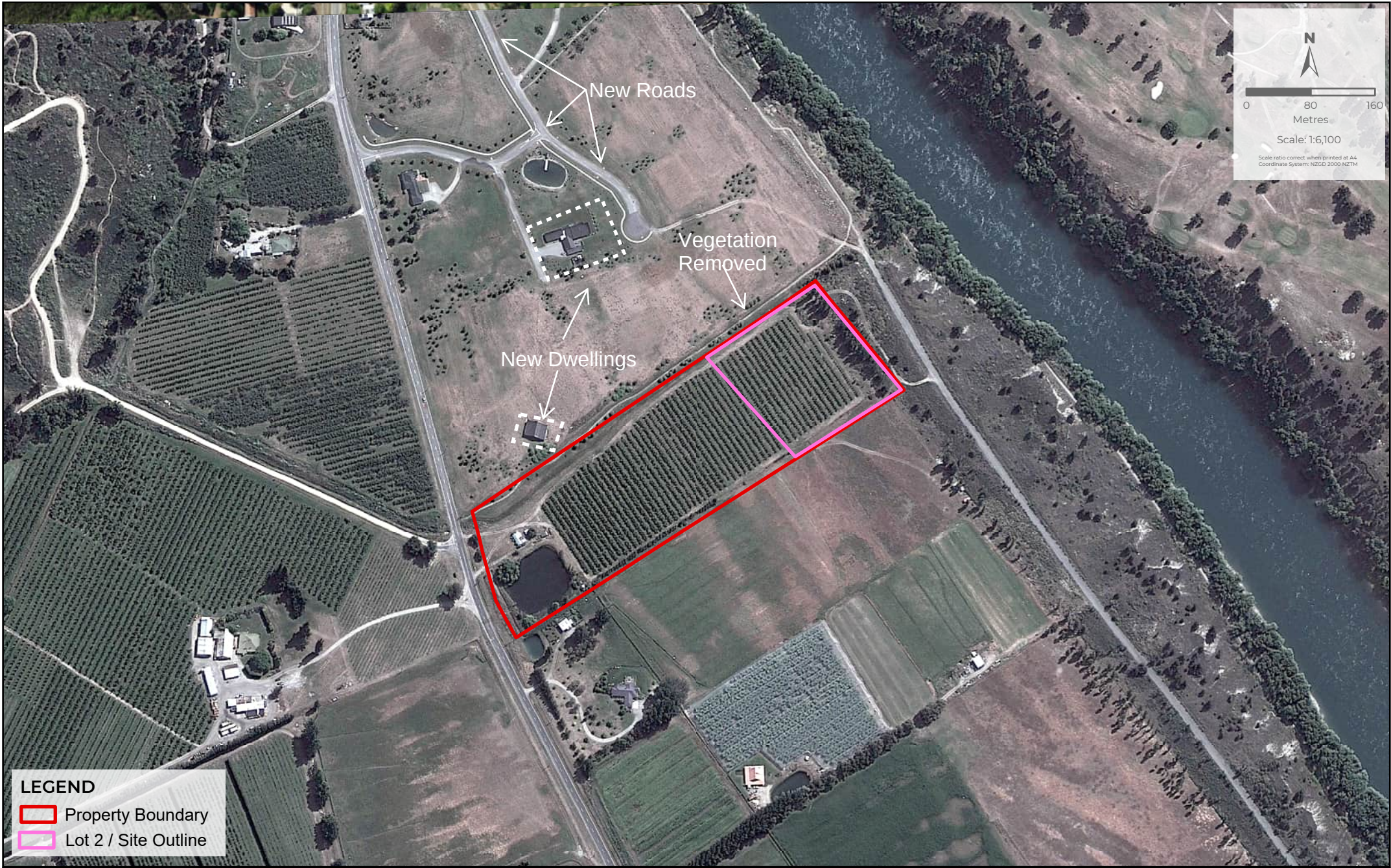


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Historical Aerial Imagery - 2017
1043 Earnsclough Road
Preliminary Site Investigation

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- Property Boundary
- Lot 2 / Site Outline



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Property Boundary

Lot 2 / Site Outline

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Historical Aerial Imagery - Latest Imagery, 2026
1043 Earnsclough Road
Preliminary Site Investigation

Otago Regional Council, Vantor

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Project Number: TBD	Author: EK	Client: 
Date: 29/04/2026	Approved by: LB	

Appendix B - Photographic Log



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZ\NZ00716
Photo No. 1	Date: 01/05/2026		
Direction Photo Facing: West			
Description: Looking west towards the existing dwelling.			

Photo No. 2	Date: 01/05/2026	
Direction Photo Facing: Northwest		
Description: Facing northwest from the proposed dwelling site.		



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZ\NZ00716
Photo No. 3	Date: 01/05/2026		
Direction Photo Facing: East			
Description: Adjacent vegetation			

Photo No. 4	Date: 01/05/2026	
Direction Photo Facing: East		
Description: Facing east towards the rear of the site		



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZINZ00716
Photo No. 5	Date: 01/05/2026		
Direction Photo Facing: Southwest			
Description: Site area			

Photo No. 6	Date: 01/05/2026	
Direction Photo Facing: N/A		
Description: Soil from within sampling location HA01.		



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZ\NZ00716
Photo No. 7	Date: 01/05/2026		
Direction Photo Facing: N/A			
Description: Sample from the sampling location HA02.			

Photo No. 8	Date: 01/05/2026	
Direction Photo Facing: N/A		
Description: Sample location HA03.		



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZ\NZ00716
Photo No. 9	Date: 01/05/2026		
Direction Photo Facing: N/A			
Description: Soil from within sampling location HA04.			

Photo No. 10	Date: 01/05/2026	
Direction Photo Facing: North		
Description: View facing north along the fruit trees.		



PHOTOGRAPHIC LOG

Client Name: Clyde Orchards		Site Location: 1043 Earnsclough Road, Alexandra	Project No. NZ\NZ00716
Photo No. 11	Date: 01/05/2026		
Direction Photo Facing: Southwest			
Description: View facing southwest			

Appendix C – Laboratory Report



Quote No 82748

Primary Contact Lisa Bond

Submitted By Lisa Bond

Client Name WSP New Zealand Ltd

Address 69 Tarbert Street

Alexandra **Postcode** 9320

Phone 03 440 2400 **Mobile** 021 224 6736

Email lisa.bond@wsp.com

Charge To

Client Reference NZ0071619.5253 (1043 Earnsclough Rd)

Order No P101541NZ001

Results To Reports will be emailed to Primary Contact by default.
Additional Reports will be sent as specified below.

☒ Email Primary Contact ☐ Email Submitter ☐ Email Client

☒ Email Other ellish.kerwin@wsp.com

☐ Other

ANALYSIS REQUEST

R J Hill Laboratories Limited
28 Duke Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

Job No: Date Recv: 06-May-26 11:00

420 5314

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Received by: Kari Nel



3142053147

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories **Date & Time:** 04/05/2026 12:30

Name: L Bond

☐ Tick if you require COC to be emailed back **Signature:**

Received at Hill Laboratories **Date & Time:**

Name:

Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen **Temp:** 18.5

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ Low ☒ Normal ☐ High

☐ Urgent (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	HS01	01/05/2026		Soil	OCP Screen; Heavy metals + Hg
2	HS02				
3	HS03				
4	HS04				
5	HS05				
6	DUP1				
7					
8					
9					
10					
11					
12					

Continued on next page

Job Information Summary

Page 1 of 1

Client:	WSP New Zealand Limited	Lab No:	4205314
Contact:	Lisa Bond	Date Registered:	06-May-2026 11:57 am
	C/- WSP New Zealand Limited	Priority:	High
	PO Box 273	Quote No:	82748
	Alexandra 9320	Order No:	P101541NZ001
		Client Reference:	NZ0071619.5253 (1043 Earnsclough Rd)
		Add. Client Ref:	
		Submitted By:	Lisa Bond
		Charge To:	WSP New Zealand Limited
		Target Date:	08-May-2026 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	HS01 01-May-2026	Soil	GSoil300	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil
2	HS02 01-May-2026	Soil	GSoil300	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil
3	HS03 01-May-2026	Soil	cGSoil	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil
4	HS04 01-May-2026	Soil	GSoil300	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil
5	HS05 01-May-2026	Soil	GSoil300	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil
6	DUP1 01-May-2026	Soil	GSoil300	Heavy Metals with Mercury, Screen Level, Organochlorine Pesticides Screening in Soil

Summary of Methods

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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-6
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-6
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1-6
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-6

Certificate of Analysis

Page 1 of 3

Client:	WSP New Zealand Limited	Lab No:	4205314	SPv1
Contact:	Lisa Bond	Date Received:	06-May-2026	
	C/- WSP New Zealand Limited	Date Reported:	12-May-2026	
	PO Box 273	Quote No:	82748	
	Alexandra 9320	Order No:	P101541NZ001	
		Client Reference:	NZ0071619.5253 (1043 Earnsclough Rd)	
		Submitted By:	Lisa Bond	

Sample Type: Soil

Sample Name:	HS01	HS02	HS03	HS04	HS05
	01-May-2026	01-May-2026	01-May-2026	01-May-2026	01-May-2026
Lab Number:	4205314.1	4205314.2	4205314.3	4205314.4	4205314.5

Individual Tests

Dry Matter	g/100g as rcvd	86	92	87	86	87
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Heavy Metals with Mercury, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	7	7	7	7	7
Total Recoverable Cadmium	mg/kg dry wt	0.10	0.17	0.13	0.16	0.24
Total Recoverable Chromium	mg/kg dry wt	8	8	8	8	9
Total Recoverable Copper	mg/kg dry wt	120	178	134	124	260
Total Recoverable Lead	mg/kg dry wt	13.3	15.6	13.2	15.1	142
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	9	9	9	9	12
Total Recoverable Zinc	mg/kg dry wt	56	58	66	61	143

Organochlorine Pesticides Screening in Soil

Aldrin	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
alpha-BHC	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
beta-BHC	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
delta-BHC	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
cis-Chlordane	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
trans-Chlordane	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
2,4'-DDD	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
4,4'-DDD	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
2,4'-DDE	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
4,4'-DDE	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
2,4'-DDT	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
4,4'-DDT	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endosulfan I	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endosulfan II	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endosulfan sulphate	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endrin	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endrin aldehyde	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Endrin ketone	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Heptachlor	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Heptachlor epoxide	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Hexachlorobenzene	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012
Methoxychlor	mg/kg dry wt	< 0.012	< 0.011	< 0.012	< 0.012	< 0.012



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

Sample Type: Soil		
Sample Name:		DUP1 01-May-2026
Lab Number:		4205314.6
Individual Tests		
Dry Matter	g/100g as rcvd	91
Heavy Metals with Mercury, Screen Level		
Total Recoverable Arsenic	mg/kg dry wt	7
Total Recoverable Cadmium	mg/kg dry wt	0.16
Total Recoverable Chromium	mg/kg dry wt	8
Total Recoverable Copper	mg/kg dry wt	193
Total Recoverable Lead	mg/kg dry wt	15.6
Total Recoverable Mercury	mg/kg dry wt	< 0.10
Total Recoverable Nickel	mg/kg dry wt	9
Total Recoverable Zinc	mg/kg dry wt	62
Organochlorine Pesticides Screening in Soil		
Aldrin	mg/kg dry wt	< 0.011
alpha-BHC	mg/kg dry wt	< 0.011
beta-BHC	mg/kg dry wt	< 0.011
delta-BHC	mg/kg dry wt	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011
cis-Chlordane	mg/kg dry wt	< 0.011
trans-Chlordane	mg/kg dry wt	< 0.011
2,4'-DDD	mg/kg dry wt	< 0.011
4,4'-DDD	mg/kg dry wt	< 0.011
2,4'-DDE	mg/kg dry wt	< 0.011
4,4'-DDE	mg/kg dry wt	< 0.011
2,4'-DDT	mg/kg dry wt	< 0.011
4,4'-DDT	mg/kg dry wt	< 0.011
Total DDT Isomers	mg/kg dry wt	< 0.07
Dieldrin	mg/kg dry wt	< 0.011
Endosulfan I	mg/kg dry wt	< 0.011
Endosulfan II	mg/kg dry wt	< 0.011
Endosulfan sulphate	mg/kg dry wt	< 0.011
Endrin	mg/kg dry wt	< 0.011
Endrin aldehyde	mg/kg dry wt	< 0.011
Endrin ketone	mg/kg dry wt	< 0.011
Heptachlor	mg/kg dry wt	< 0.011
Heptachlor epoxide	mg/kg dry wt	< 0.011
Hexachlorobenzene	mg/kg dry wt	< 0.011
Methoxychlor	mg/kg dry wt	< 0.011

Summary of Methods

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

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Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-6

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

Testing was completed between 06-May-2026 and 12-May-2026. For completion dates of individual analyses please contact the laboratory.

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

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



Martin Cowell - BSc
Client Services Manager - Environmental