REPORT PREPARED FOR:
Fulton Hogan Land Development Ltd

DETAILED SITE INVESTIGATION
MILLDALE STAGES 10-13
WAINUI

Prepared by:
Groundwater and Environmental Services
PO Box 190
Cambridge
24 February 2025

EXECUTIVE SUMMARY

This investigation has evaluated the potential for site contamination due to past and present activities across and around Milldale Stages 10-13 (the site). Additional investigation work was carried out for Lot 1 DP 488814 (107 Cemetery Road) which had not been formally investigated previously.

Previous environmental investigations for the Milldale development covered the bulk of Stages 10-13. Investigations by Tonkin & Taylor did not identify any significant potential environmental issues within the site or in the area immediately surrounding it. Investigation, remediation, and validation carried out by GES in 2023 dealt with uncontrolled fill southeast of Stage 10. Asbestos-containing fibrolite fragments, lead and PAH contamination remain in fill south of Lysnar Road. The contamination to the south of Lysnar Road is highly unlikely to have had any effect on the site.

Historic aerial photographs largely confirmed information from other sources indicating that the site and surrounds were being used primarily for grazing/agricultural activities or were covered in scrub until the 1990s. Farming-related activities/structures included farm sheds, horse dressage areas, and grazing paddocks. A pear orchard was visible to the south of Stage 10 in 1940. Filling in the area south of Lysnar Road and creation of a pond on the unnamed tributary was noted in 1988. Additional review of aerials for this investigation noted the potential for horticulture prior to 1963 within Stage 10 although the evidence was unclear.

Aerial photo review for 107 Cemetery Road confirmed that it had historically been used for pastoral grazing for dairying. Buildings on the property were progressively developed after 1940, with the milking shed on site by 1963. Site development was concentrated around the milking shed and dwelling, with an additional farm building on the adjoining paper road. A small effluent pond was located east of the milking shed and there was a larger pond south of the orchard.

A site contamination enquiry and review of property files for 107 Cemetery Road confirmed the historic dairy farming use and did not reveal any indications of potential contamination.

The walkover inspection identified potential contamination issues as follows:

- Stockyard in the west of Stage 10.
- Potential asbestos-containing material (ACM) and a small shed at 525 Wainui Road (Stage 11).
- Minor rubbish burning (<1 m^2) at 168 Argent Lane.
- Potential ACM cladding on the dwelling at 167 Argent Lane plus potential ACM fragments in stockyard/water tank areas, and rubbish burning (<1 m^2).
- A small effluent pond on Lot 3 DP 488814.
- Potential ACM sheet fragments around the east side of the hay shed in the north-west corner of Lot 3 DP 488814.

- Chemical use within the milking shed at 107 Cemetery Road and an effluent pond downstream of the shed.
- Areas of rubbish burning and potential ACM at the former shed location on the paper road extension of 107 Cemetery Road.
- Potential horticultural chemical use in the household orchard at 107 Cemetery Road.

The small areas of recent rubbish burning are *de minimus* in terms of potential site contamination effects. This material should however be removed for appropriate off-site disposal prior to any earthworks in the areas.

Soil samples and samples of potential ACM were collected from areas of concern and analysed for potential contaminants. Arsenic contamination above NES residential guidelines was identified at two locations, namely:

- Around the farm shed north of milking shed at 107 Cemetery Road.
- In the former stockyard at 167 Argent Lane.

Zinc contamination above permitted activity criteria for environmental protection was found at two locations:

- Around the farm shed north of milking shed at 107 Cemetery Road.
- South-east corner of the hay shed in the north-west of Lot 3 DP 488814.

Asbestos contamination below the BRANZ soil guideline was found by the south-east corner of the hay shed in the north-west of Lot 3 DP 488814. Asbestos was identified in building materials from the former shed location by 107 Cemetery Road, east of the Lot 3 DP 488814 hay shed, and water tank location at 167 Argent Lane.

The conceptual site model indicates that it is likely that potential contamination in specific areas of the site could have significant effects on human health or ecological receptors as the source, pathway and receptor linkages are complete or potentially complete. The presence of identified contamination means that the NES will apply the proposed redevelopment project at the site. Consent may also be required under the contaminated land provisions of the Auckland Unitary Plan.

Remediation is recommended for contamination at levels above the NES residential guideline values and permitted activity criteria for environmental protection. Remediation of areas containing fragments of ACM is also recommended. Further sampling may also be required around areas of identified contamination to confirm the extent of contamination prior to commencing any remediation.

As with any assessment of this nature, there is always the possibility that additional items not visible during the investigation may be revealed during subsequent investigations or during redevelopment of the site. Any such items should be evaluated by a suitably qualified environmental consultant in accordance with the requirements of Auckland Council.

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LIMITATIONS

No liability is assumed for misrepresentation of data or for items not visible, accessible or present at the time of the site investigations conducted by Groundwater and Environmental Services that may affect the validity and/or accuracy of the interpretation of environmental data.

Interpretations and conclusions presented herein are based on data presented in this report, information from others and experience on similar projects. The available data does not preclude the presence of materials at other locations at the site, which presently or in the future may be considered hazardous. Services in respect of this investigation have been performed in accordance with professional standards for investigations of contamination assessment. No guarantees are either expressed or implied.

This document and the information contained herein have been prepared for the use of Fulton Hogan Land Development Ltd in relation to proposed Milldale Stages 10-13, and should not be used or relied upon by any other person or entity for any other project, with the exception that the relevant territorial authority can rely on it for the purpose of processing those consent applications for which this report has been prepared. Any reliance on this report by any other parties shall be at such party's sole risk.

This document has been prepared by a suitably qualified and experienced practitioner as required by the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011).

Report Version: **Revision A – Issued for Consent**

Report prepared on: 24 February 2025

Report prepared by:

Andrew MacDonald, MSc(Hons), Principal

Statement of Qualifications and Experience - Andrew James MacDonald

I am an environmental consultant trading as **Groundwater and Environmental Services (GES)**. GES is an environmental consultancy specialising in ground and groundwater contamination assessment, management and remediation. I have been trading as **GES** since September 1995.

I hold the qualifications of Bachelor of Science, and Master of Science (Honours) degrees from Auckland University, which I completed in 1989 and 1991 respectively. I am recognised as a Suitably Qualified and Experienced Practitioner (SQEP) in contaminated land and groundwater assessment, management, and remediation under both the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) and the contaminated land provisions of the Auckland Unitary Plan.

I have 34 years of professional experience in the environmental consulting, including roles such as environmental scientist at Woodward Clyde NZ Ltd. My experience includes:

- Preliminary and detailed environmental site investigations at a wide range of potentially contaminated sites.
- Remedial action and site management plans for contaminated sites.
- Organisation and supervision of remediation at contaminated sites.
- Validation of remediation at contaminated sites and preparation of site validation reports.
- Long-term contaminated site monitoring and management plans.
- Resource consents for site remediation and ongoing discharges of contaminants to ground at contaminated sites.
- Provision of expert evidence related to contamination issues.
- Peer review of contaminated site investigations.

I have worked extensively on earlier stages of the Milldale development as well as the nearby Millwater development. I have provided consulting services to private, commercial/industrial, local government, and central government clients.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

1 Introduction

This report has been prepared in support of the application by Fulton Hogan Land Development (FHLD) for a resource consent to the Environmental Protection Authority (EPA) under the Fast-Track Approvals Act 2024 (FTAA).

Resource consent is required for bulk earthworks, subdivision, streamworks, water permits and discharge consents for the development of 606 residential lots, 27 residential super lots, jointly owned access lots (JOALS) and roads to vest, reserves to vest, and all associated works, landscaping and infrastructure.

Groundwater and Environmental Services (GES) was engaged to carry out a detailed site investigation (DSI) to assess the potential for environmental contamination within and around Milldale Stages 10-13 site. The investigation included the preliminary site investigation requirements for 107 Cemetery Road, which had not previously been investigated.

This investigation is required to determine the potential for contamination across the area due to past or present activities and has been undertaken in accordance with the requirements of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) and the contaminated land sections of the Auckland Unitary Plan (AUP).

1.1 Scope

Significant activities undertaken as part of this investigation included:

- Review of relevant previous environmental reports for the Milldale development;
- Review of aerial photographs of the investigation area and surrounding land;
- Review of council property file information and the council response to a site contamination enquiry for 107 Cemetery Road;
- Walkover inspection of the subject area to check for indicators of potential contamination;
- Collection and analysis of soil samples to check specific areas for potential contamination and
- Preparation of this DSI report in accordance with the requirements of the MFE guidelines for reporting on contaminated sites, the NES and the relevant sections of the AUP.

1.2 Site Description

The site subject to this application is located within the Milldale development and referred to as the Milldale Stages 10 – 13 subdivision areas (the Site). The site consists of Land covered by LOT 9006 DP 602895; Lot 9007 DP 602895; Lot 3 DP 151229; Lot 1 DP 147739; Lot 1 DP 488814; Lot 2 DP 488814; Lot 3 DP 488814; and Lot 2 DP 147739. Stages 10 – 13 are located within the northern and western extents of the Milldale development and comprise the remaining undeveloped greenfield stages of Milldale.

Overall, the Site covers a total area of approximately 71 ha. The Site is bordered by Wainui Road to the north, Lysnar Road to the north-east, and undeveloped land to the west. Previously consented Milldale stages are located to the south of the Site including Stages 5 – 8 and the Milldale Town Centre.

A full description of the Site and surrounds is provided in the application AEE.

Lot 9007 DP 602895 is not included in this DSI.

Stage 10 is limited to the northeast part of LOT 9006 DP 602895 (131 Argent Lane) that includes the former property at 16 Lysnar Road.

Stage 11 includes Lot 1 DP 147739 (168 Argent Lane), Lot 3 DP 151229, and parts of LOT 9006 DP 602895 (131 Argent Lane), which were formerly separate properties (507 Wainui Road, 507a Wainui Road, and 525 Wainui Road).

Stage 12 includes Lot 2 DP 147739 (167 Argent Lane) and Lot 2 DP 488814.

Stage 13 includes Lot 1 DP 488814 (107 Cemetery Road) and Lot 3 DP 488814.

1.3 Background

The investigation area is located within land that has historically been predominantly used for rural grazing as part of farms and lifestyle blocks. Much of the investigation area was historically in pasture or covered in vegetation.

Significant earthworks, including re-contouring of an unnamed tributary of Waterloo Stream, have been carried out to the south of Stages 10-13 as part of the Milldale development.

There do not appear to be any significant potentially contaminating activities currently being carried out across the investigation area.

1.4 Project Description

FHLD are proposing the subdivision and development of the site into a medium density residential development. The proposal will result in the development of the site into 606 residential lots, 27 residential super lots, jointly owned access lots (JOALS) and roads to vest, esplanade and reserves to vest, and all associated works, landscaping and infrastructure.

The development will require land modification works to facilitate Stages 10-13 of the Milldale Fast Track application. This includes bulk earthworks across the site to refine the site to the required finished levels.

A full description of the project is provided in the application AEE.

1.5 Reason for Investigation

This investigation has been carried out on behalf of FHLD to determine whether any potentially hazardous activities had been carried out on, or around, Stages 10-13 that could have resulted in contamination of the ground within the Site. This work has been carried out for consent application purposes.

1.6 Geology

The geology of the investigation area is dominated by the Mangakahia Complex[1], described as closely fractured to sheared, light or dark coloured, siliceous and locally calcareous mudstone with micaceous sandstone, siltstone, green and brown shale, and some muddy limestone.

The Mangakahia Complex commonly occurs as a melange of mixed lithologies, with a sheared mudstone matrix.

Low-lying areas around watercourses at the Site may include Tauranga Group Alluvium/Colluvium (described as Pleistocene-aged clays and silts along with swamp and colluvium deposits).

1.7 Hydrology & Hydrogeology

The most significant potentially sensitive receiving environments for any contamination within the Site would be surface water and underlying groundwater.

Surface water from the Site drains towards either a tributary of Waterloo Stream or Waterloo Stream itself, which discharges to the east into Orewa River.

Orewa River discharges to Whangaparaoa Bay through a tidal estuary located immediately south of Orewa.

Groundwater in the investigation area is also expected to eventually discharge to Orewa River.

In general, groundwater in the investigation area is likely to be perched above Northland Allochthon rock.

[1] Edbrooke, S.W. (2001). Geology of the Auckland Area. Institute of Geological and Nuclear Sciences 1:250,000 Geological Map 3.

2 Site History

The available site history has been gathered from several sources and is set out in the following sections.

2.1 Previous Environmental Reports

There have been multiple previous environmental investigations carried out for the wider Milldale development, some of which have covered parts of the current investigation area or adjacent land. Relevant previous reports include:

- Tonkin & Taylor (September 2015). Wainui East- Stage 1, Ground contamination assessment. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (January 2016). Wainui East Tranche 1, Ground contamination assessment. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (June 2016). Argent Lane Special Housing Area - Ground contamination assessment. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (August 2016). Argent Lane Special Housing Area, Qualifying Development Area – Ground contamination assessment. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (May 2017). Wainui East: Earthworks 2 Area – Ground Contamination Assessment. Prepared for Fulton Hogan Ltd
- Tonkin & Taylor (August 2017). Preliminary Site Investigation (ground contamination), Wainui East Residential Subdivision, Argent Lane Special Housing Area. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (December 2017). Wainui East Residential Subdivision. Removal of burning and asbestos wastes. Prepared for Fulton Hogan Ltd.
- Tonkin & Taylor (June 2020). Preliminary Site Investigation for ground contamination, Milldale Earthworks Precincts 2 and 3. Prepared for Fulton Hogan Land Development Ltd.
- Groundwater & Environmental Services (14 November 2023). Preliminary and Detailed Site Investigation. Part 131 Argent Lane, Milldale Stage 8, Wainui. Report prepared for Fulton Hogan Land Development Limited.
- Groundwater & Environmental Services (9 June 2024). Preliminary Site Investigation. Part 36 Sidwell Road & Lot 4 DP 353309, Milldale Stage 8, Wainui. Report prepared for Fulton Hogan Land Development Limited.

Key points from the Tonkin and Taylor reports include:

1. The assessments identified that the area had been used predominately for pastoral farming purposes, with supporting residences and infrastructure, mostly developed after the 1990s.
2. An historic pear orchard was identified on part of 56 Lysnar Road and adjoining land to the west (within Milldale Stage 5). The bulk of the orchard appeared to already be disused by the time of the 1940 aerial photograph. Soil sampling and analysis carried out on the area of remnant pear orchard found heavy metals within expected background ranges and no detectable pesticide residues.

3. Aside from the historic pear orchard, no potentially contaminating activities were identified within the surrounding area. Background information did not identify any buildings or other significant structures within the investigation area.
4. Except for the operation of a pear orchard, available evidence suggested that the residential and pastoral faming activities that occurred in the surrounding area should not be considered HAIL activities.
5. The available evidence indicated that there was a low likelihood of asbestos having been used widely across the surrounding area. Identified areas of isolated asbestos contamination and burning wastes (outside the current investigation area) were remediated and validated in 2017.

Figures from the T&T reports showing features identified in the area and the location of the former orchard are attached in Appendix B. Features identified within the current investigation area included:

- Stage 10 Stockyards near the west boundary.
- Stage 11 No identified features.
- Stage 12 Hay/storage shed near the west boundary, close to Cemetery Road.
- Stage 13 Effluent pond near the west boundary, close to the boundary with 107 Cemetery Road. Lime quarry/pond in the east of the stage. Milking shed and calf rearing in the north of 107 Cemetery Road.

Result from the recent GES investigation covering part of 36 Sidwell Road & Lot 4 DP 353309 included:

1. Previous investigations by Tonkin & Taylor did not identify any potential environmental issues within Lot 4 DP 353309.
2. GES investigations at 72 Lysnar Road identified areas of contamination towards the eastern end of that property which are highly unlikely to have had any potential environmental effects on Lot 4 DP 353309.
3. The 2018 4Sight Consulting investigation carried out for installation of public wastewater services (including on part of Lot 4 DP 353309) confirmed that no HAIL activities had occurred did not identify any contaminants across the site.
4. Contamination in fill to the south of Lysnar Road was highly unlikely to have had any effect on Lot 4 DP 353309.
5. Much of the investigation area within Lot 4 DP 353309 was used as a contractor's yard. Stockpiles of soil, road millings, and gravel were observed on site however there were no indications of contamination within the stockpiles. There were no issues identified in the surrounding area that would be likely to have resulted in contamination of the ground within the investigation area.

Land south of the eastern portion of Stage 10 was assessed during investigation, remediation, and validation of contaminated unconsented fill removal in 2023. Reports on that work included:

- Groundwater & Environmental Services (2 May 2023). Contamination Assessment – Stream Diversion Stockpile & Dam, Milldale Stage 6, 56 Lysnar Road, Upper Orewa. Letter report prepared for Kerry Dines Ltd.
- Groundwater & Environmental Services (23 August 2023). Site Validation Report, Stream Diversion Stockpile & Dam, 56 Lysnar Road, Upper Orewa. Report prepared for Fulton Hogan Land Development Limited.

Results from the 2023 assessment include:

- A stream diversion channel had been excavated through the subject property (and land to the north) to allow earthworks within the original stream and removal of the existing dam.
- Fill was encountered during excavations for the stream diversion and placed in a stockpile on site.
- The base and sides of the stream diversion were then covered with geotextile however further fill material remained beneath the cover.
- Inspection of the north side of the diversion excavation above the geotextile cloth found in situ fragments of asbestos-containing fibrolite, and previously excavated fill with isolated fibrolite pieces.
- A soil sample (FH23008) was collected from the ground on the north side of the diversion excavation, above the geotextile cloth, in an area where asbestos cement sheet fragments had been observed. The sample had heavy metal (lead) and PAH contamination at levels below applicable guidelines but no detectable asbestos fibres.

Results from the 2023 remediation and validation include:

- No contamination was found in the fill materials at levels above the permitted activity criteria for environmental protection or the NES guideline values for residential land use and outdoor worker protection.
- Remediation of the identified contamination in the fill stockpile and former dam area at 56 Lysnar Road was carried out in accordance with the approved site management plan and an asbestos removal control plan prepared specifically for the works.
- The remediation removed the **494 m³** stockpile and a further **467 m³** from the dam area.
- Excavated material was taken to Redvale Landfill for disposal.
- Validation of the remediation found no detectable asbestos, PAH or TPH contamination within the soil stockpile area or the former dam area in the south-west of the subject site.
- An inspection was carried out in the stream area immediately downstream of the diversion on 22 May 2023. No fill material was observed in the base or margins of the stream.
- Visible parts of the north bank of the diversion were also inspected on 22 May 2023. Isolated ACM sheet pieces were noted below (east of) an earthworks strip-line peg. Additional isolated ACM pieces were noted above the strip line. Fill was confirmed as being present beneath geotextile cloth in the north bank of the diversion (timber, concrete, and concrete fence posts were observed in the fill).

- The SVR noted that remaining contamination was to be remediated as part of Milldale Stage 8 earthworks.
- The contamination in fill to the south of Stage 10 was highly unlikely to have had any effect on Stages 10-13.

No previous environmental investigations had been carried out specifically for 107 Cemetery Road although some inspection was carried out as part of the 2020 Tonkin & Taylor investigation.

2.2 Review of Auckland Council Environmental databases – 107 Cemetery Road

A request for available site contamination information relating to 107 Cemetery Road and the immediate surrounding area was made to Auckland Council for this investigation.

The searched information came from the Auckland Council records system, including information currently held by the Auckland Council Natural Resources and Specialist Input Unit. This excluded council property file information, which was requested separately and is discussed in the following section. A copy of the Auckland Council response to the site contamination enquiry is attached to this report as Appendix A.

Auckland Council was unable to locate any information in its files regarding spills or contamination within the subject property and no pollution incident files were found for the investigation area. It was noted that due to the age of the dwelling on site the potential for asbestos and/or lead paint may need to be considered.

The former Auckland Regional Council and current Auckland Council Natural Resources and Specialist Input Unit databases were searched for contaminated site discharge consents, environmental assessments, landfill, air discharge, borelog, and industrial trade process consents within approximately 200 metres of the site.

No activities were identified in the surrounding area that were likely to cause significant contamination within the current investigation area.

A 2017 permitted activity assessment was noted for land application of farm dairy wash water at 120 Cemetery Road (southwest of 107 Cemetery Road). Application of wash water to land at 120 Cemetery Road is highly unlikely to have resulted in contamination of the ground at 107 Cemetery Road.

2.3 Review of Auckland Council Property Files – 107 Cemetery Road

An electronic copy of the Auckland Council property file for 107 Cemetery Road was obtained and reviewed for this investigation. Information from the property file is discussed below:

The property file for 107 Cemetery Road confirms that it had primarily been used for grazing purposes, including dairy farming. The property file did not contain any information relating to potential contamination either within, or around, the property.

A 1961 file note discussed a proposed garage on site although no further information was provided.

There was a 1967 building permit for construction of a dwelling and garage with cedar weatherboard cladding. A septic tank was shown at the rear of the dwelling. The permit application noted that an existing farmhouse was to be removed.

The current lot was created in 2015 as part of a boundary readjustment subdivision of original neighbouring lots under the same ownership. The subject property was contained farm sheds, a milking shed, a dwelling and garaging at the time of subdivision. The land was predominantly used for grazing and was described as having a gentle rolling contour. No potential contamination issues were identified.

No other potential environmental issues were identified in the property files within, or immediately around, 107 Cemetery Road.

2.4 Dangerous Goods Licences

No known dangerous goods licences are known to have been held for properties within proposed stages 10-13.

2.5 Review of Aerial Photographs

2.5.1 Previous investigation Observations

Aerial photographs for most of Stages 10-13 were reviewed for previous investigations, particularly in the Tonkin & Taylor report prepared between 2015 and 2020. A summary of the aerial photo observations from the June 2020 PSI is provided below:

The earlier photographs confirmed that the site and surrounds were being used for grazing/agricultural activities or were covered in scrub until the 1990s. This was consistent with the agricultural history of the wider area.

Much of the infrastructure across the site in 2020 was developed in the late 1990s to early 2000s. Recent modification of the site and immediately surrounding areas appeared to have been limited to:

- Development of residential housing;
- House improvements; and
- Subdivisions on the site and in the surrounding area.

Farming-related activities/structures observed, included farm sheds, horse dressage areas, and grazing paddocks.

Earthworks associated with initial stages of the wider Wainui development were evident from 2017.

An area of regularly spaced trees was present to the south of proposed Stage 10 in the 1940 aerial. By 1963 the plantation has reduced in size, being similar to the small section of these trees still present in the later images. Other groves of trees evident in early 2000s aerial photographs were indicative of plantation style forestry rather than commercial horticulture.

2.5.2 Additional Observations for Stages 10-13

Additional observations from a review of the aerial photographs for this investigation are provided below.

Table 1 Additional Aerial Photo Observations – Stages 10-13

Date	Observations
1940	Possible horticulture within the paddocks in Stage 10. Hay/storage shed in northwest corner of Lot 3 DP 488814. Dwelling in southwest corner of Lot 2 DP 488814.
1963	No sign of horticulture Stage 10.
1973	Large gravel or paved stock handling yard constructed in the east of 167 Argent Lane.
1981	Dwelling removed from southwest corner of Lot 2 DP 488814. Dwelling and associated sheds constructed at 167 Argent Lane. Recently constructed dwelling in the northeast of 507 Wainui Road. Dwelling and sheds constructed at 16 Lysnar Road (in east of Stage 10)
1988	Barn constructed north of the dwelling at 507 Wainui Road (close to road). Dwelling constructed at 525 Wainui Road.
1996	Lime quarry/pond excavated in the east of Lot 3 DP 488814. Stockyards constructed in the west of Stage 10. Large half-round shed constructed west of the barn at 507 Wainui Road. Large pond constructed to the south of the dwelling at 507 Wainui Road. Shed constructed near the dwelling at 525 Wainui Road. Dwelling constructed at 507a Wainui Road.
2010/11	Dwelling, shed, and pool constructed at 168 Argent Lane. Dwelling at 16 Lysnar Road extended.

The most significant additional item of potential environmental concern identified by the current review of aerial photographs was the potential for historic horticulture within Stage 10.

2.5.3 107 Cemetery Road

A review of aerial photographs from 1940 onwards covering 107 Cemetery Road and surrounding land was undertaken as part of the current investigation.

Copies of the photographs obtained from Retrolens for the years 1940, 1961, 1963, 1973, 1981, and 1988 are included in Appendix C, along with Geomaps photographs from 1996, 2010/11 and 2017.

Observations from the photographs are provided in the table below.

Table 2 Aerial Photo Observations – 107 Cemetery Road

Date	Observations
1940	The property was in pasture with a shed visible around the area of the present-day milking shed. Surrounding land is also mostly in pasture or low scrub (to the west).
1963	The milking shed and yard are visible in the west of the property, adjacent to a turning area at the south end of the extension of Cemetery Road. Farm tracks head to the east and south from the shed area. A small shed (pump shed) is located to the north of the milking shed. The balance of the property is in pasture with no other buildings visible.
1973	The property is largely unchanged and remains mainly in pasture. A large farm shed has been constructed southwest of the milking shed on the paper road extension of Cemetery Road. A dwelling has been constructed to the south of the milking shed. A small household orchard has been planted to the southeast of the dwelling and there is a farm pond south of the orchard.
1981	No changes
1988	No changes
1996	The property is largely unchanged. Small ponds are visible either side of the track to the east of the milking shed. These are likely to be effluent ponds.
2001	The property is largely unchanged however a farm shed has been constructed to the south of the dwelling and there is an extension on the north side of the shed on the paper road.
2010/11	Another farm shed has been constructed immediately north of the milking yard. Two small sheds have also been constructed south of the dwelling.
2017	The investigation area appears unchanged. There are no indications of any potentially contaminating activities.
2024	No significant changes

The aerial photographs largely confirmed information from other sources indicating that the property had historically been used for pastoral grazing for dairying. Buildings on the property were progressively developed after 1940, with the milking shed on site by 1963. Site development was concentrated around the milking shed and dwelling, with an additional farm building on the adjoining paper road. A small effluent pond was located east of the milking shed and there was a larger pond south of the orchard.

2.6 Information from Property Owners

The current property owner for Stages 10-13 (Fulton Hogan Land Development Ltd) is not aware of any actual or potential contamination issues within the investigation area.

The owners of 107 Cemetery Road were not aware of any actual or potential contamination issues within the property.

Previous owners of the properties across Stages 10-13 were unable to be interviewed as part of this investigation.

Site Walkover Inspection Results

A walkover inspection of part of the Site was carried out on 6 and 7 November 2024. Observations from the walkover are discussed below.

2.7 Nature and Extent of Anticipated Contamination

At the time of the inspection, available information suggested that there were some potential sources of historic or recent contamination within Stages 10-13. The bulk of the potential contamination issues related general farming activities and included:

- Possible former horticulture within Stage 10.
- Stockyards within Stage 10 and 12.
- Former dwelling location in the east of Stage 12.
- Farm buildings and sheds within Stages 10-13.
- Effluent ponds within Stage 13.
- A household orchard within Stage 13 (in the southeast of 107 Cemetery Road).

2.8 Walkover Observations

Observations from the walkover inspections of the site are provided below. Selected photographs taken during the site inspections are attached to this report in Appendix D.

107 Cemetery Road

The bulk of the property was in pasture. There was a collection of buildings in the north of the property, next to the end of the formed part of Cemetery Road. Structures included a concrete milking shed with a milking pit and concrete floor, a corrugated iron farm shed with concrete floor, a concrete water tank by the north-east corner of the shed, and a stock handling yard and ramp on the south side of the milking shed. Empty chemical containers stored within milking shed. Discharges from the milking shed area appeared to be channelled to the east to a small effluent pond. A second pond was located on the east side of the track, downstream of the first pond. Drainage from the farm shed was also to the east.

A small stockyard was also located in the vehicle turning area at the end of Cemetery Road.

The former shed located within the paper road (south of the current end of cemetery Road) had recently been demolished. A rubbish/demolition material burning pile was located within the former shed footprint. Items visible within the burning pile included steel, nails, and pieces of fibre cement sheet that potentially contains asbestos. There was a small retained area south of the former shed location that may have been used for stock loading. No potentially hazardous materials were observed within the retained area.

The cedar weatherboard dwelling was located near the western property boundary, roughly in the middle of the property. There is evidence for a septic tank south of the dwelling. A disused painted corrugated iron garage in poor condition was located north of the dwelling. A large galvanised iron three bay farm shed with a concrete floor was located to the south of the dwelling. There was a concrete water tank and an area of soil with minor rubbish west of the

shed. A partially demolished small shed/sleepout was located north-east of the farm shed and south of the dwelling.

A disused household orchard was located near the eastern property boundary, east of the dwelling. A pond was located south of the orchard area. There was a pump shed located by the north-east corner of the pond and the pond outflow was located under a bund in the north-east corner. A small pond was located west (and uphill) of the larger pond.

Lots 2 & 3 DP 488814

These two properties within Stages 12 and 13 were in pasture. Drainage features that generally drain towards the east were observed across the properties. In areas where tracks across the drainage features there were typically concrete pipes under the tracks. The former lime quarry/pond in the east of Lot 3 was no longer visible as earthworks from the Milldale development had encroached into the east of Lot 3. Small man-made ponds were observed in both lots over there were no indications of any potential contamination in or around the ponds.

A small effluent pond is located within Lot 3, close to the boundary with 107 Cemetery Road and downstream of the milking shed.

A corrugated iron hay shed with an earth floor was in the north-west corner of Lot 3. A concrete trough and isolated potential asbestos-containing sheet fragments were observed by the north-east and north-west corners of the shed.

A concrete fireplace, larger square concrete pad, and concrete water tank was located at the former dwelling location in the south-west of Lot 2.

167 Argent Lane

The bulk of the property outside of the house lot was in pasture. The main dwelling, former cattery building and a secondary dwelling remained on site. The main dwelling was split-level with fibrolite cladding on the basis and a mixture of fibrolite and corrugated iron cladding on the upper level. A septic tank was located on the south side of the dwelling. There was evidence of recent demolition of former buildings/structures to the north and west of the dwelling. At a former shed location on the north side of the driveway there were possible asbestos-containing sheet fragments by the north-east corner. There were also possible asbestos-containing sheet fragments in the south of the former stockyard area and in the area west of the dwelling (near the former water tank locations). A small semi-circular fire pit was in the lawn north of the dwelling. Contents of the fire pit included ash, steel, and wood fragments.

168 Argent Lane

The dwelling and separate shed/garage remained on site at 168 Argent Lane. There was a storage area on the south side of the shed a pile of scrap material on the east side. A former incinerator location (<1 m^2) was noted south of the dwelling with minor ash residues. The household wastewater treatment system was also located south of the dwelling. The former sheds and other structures located to the east of the dwelling had been removed and the balance of the property outside of the house lot has undergone recent earthworks and hay mulching.

Lot 3 DP 151229
This property is located immediately south of 168 Argent Lane. The property is in pasture and does not contain any buildings or other significant structures.

131 Argent Lane
The portions of this lot that are within Stages 10 and 11 include the former individual properties at 16 Lysnar Road, 507 Wainui Road, 507a Wainui Road, and 525 Wainui Road. These properties will be discussed individually below.

507 Wainui Road
This property includes a large half round shed, a small galvanised iron shed, and a two-storey wooden shed in the area close to Wainui Road. There were no indications of contamination around the sheds. A single level cedar weatherboard dwelling is located to the south of the sheds. A disused pool remains on the east side of the dwelling.

A large former pond is in a bush area south of the house. The bund around the pond has rock on it and there is a concrete path around the area.

507A Wainui Road
The dwelling at 507a Wainui Road is located to the west of the dwelling at 507. It consists of a single level cedar weatherboard dwelling. A pile of demolition material remains from removal of the former deck around dwelling and brick, concrete and posts.

525 Wainui Road
The dwelling and outbuildings at 525 Wainui Road located south of the dwelling at 507a. There was a single level dwelling and a large colour steel shed with plywood baseboards. A septic tank is located to the west of the dwelling. A small fibrolite shed on piles and an outhouse were located south-east of the dwelling and close to the stream.

16 Lysnar Road
A large dwelling with plaster cladding and associated outbuildings were located close to Lysnar Road, in the east of the property. A septic tank was located west of the dwelling. Outbuildings included:

- A shed/tack room with wooden cladding and one concrete tank and one plastic tank on its east side.
- An open two bay shed with equipment stored inside and a plastic water tank on its south side.

The bulk of the property was in pasture and used for grazing. There were no visible indications of past commercial horticulture. A stockyard was in the west of the property.

2.9 Summary of Walkover Observations

Identified areas of potential concern from the walkover are summarised in the table below.

Table 3 Inspection Potential Contamination Issues

Location	Description
16 Lysnar Road	Former stockyard
507 Wainui Road	No issues identified
507a Wainui Road	No issues identified
525 Wainui Road	Potential asbestos-containing material in shed by stream
168 Argent Lane	Rubbish burning residue (<1 m^2)
167 Argent Lane	Potential asbestos-containing fibrolite cladding on dwelling Potential asbestos-containing fibrolite fragments in areas of former shed, stockyard, and water tanks Rubbish burning residue (<1 m^2)
Lot 3 DP 151229	No issues identified
Lots 2 DP 488814	Former dwelling location in southwest corner
Lots 3 DP 488814	Small effluent pond downstream of milking shed at 107 Cemetery Road Potential asbestos-containing sheet fragments east of hay shed in northwest corner of lot.
107 Cemetery Road	Farm chemical use within the milking shed Effluent pond east of milking shed Ash and potential asbestos-containing material within demolition burning pile at former shed location within paper road Minor rubbish on ground west of large shed (south of dwelling) Potential horticultural chemical use in household orchard

Potential contamination issues identified by the walkover were targeted for sampling and analysis along with other previously identified potential issues. No items of potential environmental concern were identified across the bulk of Stages 10-13.

There were no issues identified in the surrounding area that would be likely to have resulted in contamination of the ground within the Site.

3 HAIL Activities

The Ministry for the Environment's Hazardous Activities and Industries List (HAIL) specifies activities/industries that have the potential to result in contamination. Where current or former HAIL activities are identified on a property, intrusive investigation is generally required prior to a change in land use or redevelopment of those areas. Actual and potential HAIL activities for the investigation area are evaluated in Table 4 below using the information gathered for this investigation. The selection of potential HAIL activities was based on information gathered about the site and experience on sites with similar history.

Table 4 Potential HAIL Activities

HAIL ID	Description	Assessment
A.8	Livestock dip or spray race operations	Highly Unlikely No evidence for the presence of livestock dip or spray race structures within the site.
A.10	Persistent pesticide bulk storage or use	Possible Aerials suggest possible horticulture within Stage 10 (low probability). Household orchard at 107 Cemetery Road A pre-1940 pear orchard (south of Stage 10) was the only commercial horticulture activity definitely identified in the surrounding area. Previous testing of soil within the orchard found no detectable contamination implying that there was no significant use of horticultural chemicals.
A.17	Storage tanks or drums for fuel, chemicals or liquid-based	Highly Unlikely No evidence of significant fuel/chemical storage on within, or around, the investigation area.
E.1	Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition	Likely Potential asbestos-containing materials identified at specific locations on 167 Argent Lane, Lot 3 DP 488814, and 107 Cemetery Road
G.3	Landfill sites	Highly unlikely Historic aerial photographs and walkover inspections did not provide any indications of potential landfill sites within the investigation area.
G.5	Waste disposal to land (excluding where biosolids have been used as soil conditioners)	Likely Small milking shed effluent ponds on Lot 3 DP 488814, and 107 Cemetery Road No other indications for any waste disposal to land within the investigation area.
H	Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it	Highly Unlikely Contamination was identified on land to south of Stages 10 however no mechanisms identified for migration of the contamination to the investigation

	could be a risk to human health or the environment	area. No potentially hazardous substances that would be likely to affect the investigation area are likely to be present on other adjacent land
I	Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment	Highly Unlikely No evidence to suggest that there would have been any releases of hazardous substances to land within the investigation area. Ash from rubbish burning (<1 m^2) on gravel hardstand is considered to be *de minimus* and unlikely to have resulted in any significant releases of hazardous substances to land

3.1 Preliminary Conceptual Site Model

The information gathered for this PSI has been used to prepare a preliminary conceptual site model (CSM) for the investigation area to aid in determining whether intrusive investigation is likely to be required. The CSM provided in Table 5 evaluates contaminant source, pathway, and receptor linkages for potential items of concern during redevelopment or under future commercial/industrial, residential, or recreational land use.

Table 5 Preliminary Conceptual Site Model

Potential Source	Potential Pathways	Potential Receptors	Assessment
Contaminated Soil due to HAIL Activities	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Potentially complete: Limited HAIL Activities identified within specific parts of the investigation area
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	
	Inhalation of vapours	Human Health - residential and outdoor worker	
	Surface water run-off	Ecological receptors – Waterloo Stream	
	Migration of groundwater	Ecological receptors – Waterloo Stream	

The preliminary conceptual site model identifies that the source, pathway, receptor linkages as potentially complete as limited HAIL activities were identified within specific parts of the investigation area. Assessment of the presence of contamination within the areas of the HAIL activities is required.

4 Intrusive Investigation and Sampling

Limited intrusive investigation and sampling targeting areas of potential contamination was carried out on 6 and 7 November 2024 in conjunction with the walkover inspection.

The investigation and sampling included:

- Collection of soil samples from across the paddocks in Stage 10 where the potential for past commercial horticulture had been identified.
- Collection of soil samples from the stockyard in the west of Stage 10.
- Collection of soil samples from shed and stockyards areas at 167 Argent Lane.
- Collection of soil samples from immediately downstream of the hay barn in the north-west corner of Lot 2 DP 488814.
- Collection of soil samples from around the farm shed and milking shed at 107 Cemetery Road.
- Collection of soil samples from the effluent pond downstream of the milking shed at 107 Cemetery Road.
- Collection of soil samples from the area west of the farm shed (south of the dwelling) at 107 Cemetery Road.
- Collection of soil samples from the household orchard at 107 Cemetery Road.
- Collection of potential asbestos-containing materials from 107 Cemetery Road and 167 Argent Lane and analysis of the samples for asbestos.
- Analysis of soil samples for potential contaminants based on information about the specific areas from which the samples were collected.

General observations and details of sampling procedures, material logs and analytical results are provided in the following sections.

4.1 General Observations

There were no visual or odour indications of potential contamination within the soil samples aside from the presence of potential asbestos-containing materials in the areas of samples MDL24015 and 016.

4.2 Soil Sampling

The samples were collected according to the methods outlined in the following sections. Sample locations are shown on Figure 2. The sampling was carried out in accordance with the requirements of the Ministry for the Environment's Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (June 2021).

4.2.1 Sampling Method

Each sampling location was set out prior to the start of sampling.

Soil samples were collected using a stainless-steel trowel or hand auger as appropriate. Each sample was placed into a stainless-steel mixing bowl before being homogenised and placed into the appropriate labelled sample jar. Where duplicate samples were collected, the homogenised sample was split evenly between two sample containers.

Samples of building materials for asbestos analysis were picked up using clean gloved hands and placed into a labelled zip-lock bag. The zip-lock bag was placed inside another zip-lock bag in accordance with Hill Laboratories sample receipt requirements.

The sample jars and zip-lock bags were supplied by Hill Laboratories.

Three sets of duplicate samples were collected for quality assurance purposes.

4.2.2 Sample Handling

Samples for chemical analysis were placed into 250 ml glass jars, sealed and put directly into a cold chilly bin. The samples were kept in cold storage for delivery to Hill Laboratories under chain of custody documentation.

Soil samples for asbestos analysis were placed into 500 ml plastic jars, sealed and put directly into a chilly bin for delivery to Hill Laboratories under chain of custody documentation.

Samples of building materials for asbestos analysis were double bagged in zip-lock bags. The samples were placed into a chilly bin for delivery to Hill Laboratories under chain of custody documentation.

Each sample was given a unique identification number as follows:

Site Identifier/Year Reference/Sample Number

The client identifier was “MDL”, the year reference was “24”, and the sample number was a 3-digit number from 001 to 051.

4.2.3 Equipment Decontamination

Sampling equipment was decontaminated prior to use at each sample location by rinsing in a potable water bath, washing in a solution of potable water and Decon 90 (a zero residue analytical detergent), and rinsing in another bath of potable water.

The nature of hand auger sampling means that there is potential for contamination of deeper samples with material from the shallower part of the hole. Efforts were made during sampling to minimise any such contamination.

4.3 Material Descriptions

The sample locations, depth ranges, and geologic materials encountered during the sampling are provided in Appendix E to this report.

Attention was paid to the possible presence of indicators of chemical contamination. Typical chemical contamination indicators would usually include unusual colouring, visible chemical residues, the presence of refuse, and noticeable odours. Attention was also paid to the possible presence of visible asbestos containing materials such as asbestos cement sheet pieces.

5 Analytical Results

Samples were delivered under cold storage to Hill laboratories for chemical and asbestos analysis as soon as possible following their collection.

The requested analyses targeted likely potentially significant contaminants for each sample location.

The analytical results for the chemical analyses are summarised in **Table 6** and the results for the asbestos analyses in soil are summarised in **Table 7**. The results for asbestos analysis of building material samples are presented in **Table 8**.

The laboratory analytical reports from Hill Laboratories is reproduced in full in Appendix E and the analytical results are discussed in following sections with reference to the appropriate guidelines.

5.1 Site Contamination Guidelines

A range of numerical guidelines have been published, against which site contaminant concentrations can be compared to determine the degree of risk that they present to human health and the environment. Representative values have also been published for the normal range of concentrations of metals in both non-volcanic-derived and volcanic-derived soils from the Auckland Region.

For the purposes of this investigation, heavy metal concentrations have been compared to the non-volcanic-derived background ranges for soils from the Auckland region.

Contaminant concentrations are compared to the permitted activity criteria for potential discharges of contaminants to the environment as specified in E30.6.1.4 of the Auckland Unitary Plan.

The concentrations are also compared to the National Environmental Standards for the protection of human health on commercial/industrial land and for outdoor worker protection. Standards for residential land with 10% home-grown produce consumption were included to reflect the planned eventual redevelopment of the site for future residential land use. A change to a more sensitive land use would require a review of the standards used.

The relevant background concentrations, permitted activity criteria and national environmental standards are provided in the analytical results table (**Table 6**).

The comparison of guidelines with actual site contamination provides guidance on the potential risks presented by the site contamination.

The need for remediation or controls on access to contamination is established by evaluating the actual risk on a site-specific basis. Factors involved in this evaluation include the physical and chemical characteristics of the contaminants, their toxicity, and the ease of exposure of humans, plants, and animals to contaminants in soil, air, and water.

Table 6 Analytical Results (mg/kg)

Sample Name	Depth m	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Total PAH	BAP eq	MRP
107 Cemetery Road											
MDL24001	0-0.15	2	0.2	7	38	9.6	9	131	< 0.4	< 0.038	-
MDL24003	0-0.15	2	< 0.10	7	52	6.8	17	49	< 0.4	< 0.032	-
MDL24005	0-0.15	2	0.16	6	8	7.1	6	45	-	-	-
MDL24007	0-0.15	**53**	**0.83**	27	63	20	20	**450**	< 0.3	< 0.029	-
MDL24008	0.15-0.3	7	0.14	-	-	-	-	98			
MDL24009	0-0.15	3	0.61	7	5	20	2	47	-	-	ND
Lot 3 DP 488814											
MDL24017	0-0.15	4	0.55	10	41	41	15	**730**	< 0.4	< 0.034	-
MDL24018	0.15-0.3	-	-	-	-	-	-	**1000**			
167 Argent Lane											
MDL24021	0-0.1	4	0.19	6	10	9.6	8	49	-	-	ND
MDL24023	**0-0.15**	**29**	0.28	27	50	14.5	11	160	-	-	ND
MDL24024	**0.15-0.25**	**21**	-	-	-	-	-	-			
131 Argent Lane - Stockyard											
MDL24025	0-0.15	3	0.12	5	5	3.9	< 2	27	-	-	ND
MDL24026	0-0.15	3	0.15	5	6	4.2	< 2	29	-	-	ND
MDL24028	0-0.1	6	0.14	9	11	3.3	< 2	38	-	-	ND
131 Argent Lane - Paddocks											
MDL24030	0-0.15	4	0.12	7	4	8.5	2	20	-	-	-
MDL24032	0-0.15	2	0.19	5	4	7	< 2	17	-	-	-
MDL24034	0-0.15	3	0.15	5	3	10.8	< 2	14	-	-	-
MDL24036	0-0.15	< 2	< 0.10	3	< 2	3.5	< 2	4	-	-	-
MDL24038	0-0.15	2	0.13	3	6	12.1	3	18	-	-	-
MDL24040	0-0.15	7	< 0.10	7	< 2	6.8	< 2	6	-	-	-

MDL24041	0.15-0.3	< 2	0.11	2	3	10.2	< 2	15	-	-	-
MDL24042	0-0.15	2	< 0.10	5	< 2	6.1	< 2	6	-	-	-
MDL24043	0-0.15	< 2	< 0.10	3	< 2	3.9	< 2	6	-	-	-
MDL24045	0-0.15	< 2	0.14	5	3	7.9	14	8	-	-	-
MDL24047	0-0.15	< 2	0.13	3	< 2	7.3	< 2	10	-	-	-
MDL24049	0-0.15	4	0.13	6	4	10.3	3	22	-	-	-
MDL24050	0-0.15	4	0.14	6	5	10.9	3	25	-	-	-
Composite Samples											
MDL24030 & 32	0-0.15	-	-	-	-	-	-	-		-	ND
MDL24034 & 36	0-0.15	-	-	-	-	-	-	-		-	ND
MDL24038 & 40	0-0.15	-	-	-	-	-	-	-		-	ND
MDL24043 & 45	0-0.15	-	-	-	-	-	-	-		-	ND
MDL24047 & 49	0-0.15	-	-	-	-	-	-	-		-	ND
Background - Non-Volcanic		**0.4-12**	**<0.1-0.65**	**2-55**	**1-45**	**<1.5-65**	**0.9-35**	**9-180**	**-**	**-**	
NES–Residential – 10%		**20**	**3**	**460**	**NL**	**210**	**400**	**7400**	-	**10**	
NES – Commercial/Industrial Outdoor Worker		**70**	**1300**	**6300**	**NL**	**3300**	**4000**	**400000**		**35**	
Permitted Activity Criteria		**100**	**7.5**	**400**	**325**	**250**	**105**	**400**	**-**	**20**	

Notes:

1. NL denotes “Not Limited” (>10,000 mg/kg).
2. Bold heavy metal values exceed the upper end of the natural background range for Auckland Region non-volcanic soils
3. Shaded values exceed the National Environmental Standard for residential land use with 10% home-grown produce consumption.
4. Red values exceed the Auckland Unitary Plan permitted activity criteria for environmental protection.

Table 7 Asbestos in Soil Results

Sample Name	Unknown Asbestos	Asbestos Presence / Absence	Asbestos Form	Fibrous Asbestos (Friable) g dry wt	Fibrous Asbestos % w/w	Asbestos Fines (Friable) g dry wt	Asbestos Fines % w/w	Combined FA+ AF % w/w
MDL24015	ND	Asbestos ND.	-	< 0.00001	< 0.001	< 0.00001	< 0.001	< 0.001
MDL24016	ND	Chrysotile detected.	Loose fibres	< 0.00001	< 0.001	0.00005	< 0.001	< 0.001
BRANZ Soil Guideline Value								**0.001**

Notes:

1. ND denotes "Not Detected"
2. Combined FA+ AF denotes "Combined Fibrous Asbestos + Asbestos Fines"

Table 8 Asbestos in Building Material Results

Sample Name	Amosite	Chrysotile	Crocidolite	Organic Fibres	Synthetic Mineral Fibres	Unknown Asbestos	Sample Category	Asbestos Presence / Absence
MDL24011	ND	Detected	ND	ND	ND	Detected	Fibre Cement	Chrysotile (White Asbestos) detected.
MDL24012	ND	ND	ND	Detected	ND	ND	Fibre Cement	Asbestos Not Detected
MDL24013	Detected	Detected	ND	ND	ND	ND	Fibre Cement	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.
MDL24014	ND	Detected	ND	ND	ND	ND	Fibre Cement	Chrysotile (White Asbestos) detected.
MDL24019	ND	ND	ND	Detected	ND	ND	Fibre Cement	Asbestos Not Detected
MDL24020	Detected	Detected	ND	Detected	ND	ND	Fibre Cement	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.

Notes: ND denotes "Not Detected"

5.2 Quality Assurance/Quality Control

In addition to standard laboratory QA/QC, three sets of duplicate samples were collected in the field to assess the variation of the analytical results and/or the homogeneity of the samples.

The results from the duplicate samples are presented in **Table 9**, along with the calculated relative percentage difference (RPD) for each analyte. Ministry for the Environment guidelines suggest that a relative percentage difference of less than 30-50% is generally acceptable.

RPDs could not be calculated for the multi-residue pesticide results for duplicate samples MDL24025 and 026 as all values were below the analytical detection limits. Similarly, RPDs could not be calculated for heavy metal results where one of both of the results was below the analytical detection limits.

With the exception of the RPD for arsenic for samples MDL24040 and 042, the calculated RPDs for heavy metals were all within the generally acceptable guidelines. The RPD for arsenic for samples MDL24040 and 042 of 111 is higher than generally accepted and is likely indicative of heterogeneous distribution of arsenic within the sampled material.

RPDs could not be calculated for the PAHs as they were not present in the samples at levels above the analytical detection limits. The results can however be seen as consistent between the analysed duplicate samples.

RPDs could also not be calculated for the asbestos results as no asbestos was detected in the duplicate samples. The results can however be seen as consistent between the analysed duplicate samples.

Based on the RPDs that could be calculated and the consistency of results where no contaminants were present at levels above the analytical detection limits, the sampling and analysis of the duplicates appears to be providing repeatable results.

Standard QA/QC reports from the analytical laboratories were not reviewed for this report but are available from the laboratories if required.

Table 9 Comparison of Duplicate Samples

Sample Name:	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
MDL24025	3	0.12	5	5	3.9	< 2	27
MDL24026	3	0.15	5	6	4.2	< 2	29
RPD	**0**	**22**	**0**	**18**	**7**	**NC**	**7**
MDL24040	7	< 0.10	7	< 2	6.8	< 2	6
MDL24042	2	< 0.10	5	< 2	6.1	< 2	6
RPD	**-111**	**NC**	**-33**	**NC**	**-11**	**NC**	**0**
MDL24049	4	0.13	6	4	10.3	3	22
MDL24050	4	0.14	6	5	10.9	3	25
RPD	**0**	**7**	**0**	**22**	**6**	**0**	**13**

Notes:

1. All results are given in mg/kg.
2. "**NC**" signifies a RPD that could not be calculated due to one or more of the results being below the analytical detection limit.

Standard QA/QC procedures were followed during sample analysis in the laboratory.

5.3 Discussion of Analytical Results

Sample locations with detectable contamination are summarised in the table below along with a description of the type of contamination.

Table 10 Detected Contamination

Location	Sample number	Contamination
107 Cemetery Road		
NW corner of shed N of water tank	MDL24007	Arsenic above NES residential guidelines & zinc above permitted activity criteria.
Former shed location – paper Road	MDL24011	Asbestos-cement material fragment
Lot 3 DP 488814		
Near northeast corner of shed	MDL24013	Asbestos-cement material fragment
	MDL24015	Asbestos-cement material fragment
Near southeast corner of shed	MDL24016	Asbestos in soil below BRANZ soil guideline
	MDL24017 & 018	Zinc above permitted activity criteria
167 Argent Lane		
Near water tank	MDL24020	Asbestos-cement material fragment
East end of stockyard, near loading ramp	MDL24023 & 24	Arsenic above NES residential guidelines

Aside from the locations set out in Table 10 above, no heavy metal contamination was present at levels outside of the normal background ranges for the individual metals.

No polycyclic aromatic hydrocarbon (PAH) or multiresidue pesticide (MRP) contamination was present in any of the samples that were analysed for those contaminants at levels above the analytical detection limits.

The detected arsenic and zinc contamination in the sample MDL24007 north of the farm shed at 107 Cemetery Road present a potential risk to human health (arsenic) and the environment (zinc) under the proposed residential land use and remediation is therefore likely to be required in the area of the sample prior to general earthworks.

Asbestos-containing fibrolite in the former shed area along the paper road alignment adjacent to 107 Cemetery Road presents a potential risk to human health if it is disturbed. The volume of asbestos-containing material appeared low however it is recommended that this material was removed along with the remaining pile of burnt demolition material prior to any earthworks being undertaken in that area.

The presence of asbestos-containing material in soil around the hay shed in the northwest of Lot 4 presents a potential risk to human health if the material is disturbed. The level of asbestos detected in soil is below the BRANZ soil guideline value and is therefore unlikely to present a significant risk to human health however its association with asbestos cement

sheet pieces in the soil means that remediation of asbestos contamination is recommended. The zinc contamination in soil around the hay shed also presents a potential risk to the environment and should be remediated prior to any redevelopment earthworks in the area.

Asbestos-containing fibrolite found in the west of the house lot at 167 Argent Lane presents a potential risk to human health and should be remediated prior to any earthworks in the area. The arsenic in soil at levels above the NES residential guideline value also presents a risk to human health under future residential land use. Remediation of the arsenic contamination is also recommended.

5.4 Conceptual Site Model

The information gathered for this investigation has been used to revise and expand on the preliminary conceptual site model to aid in determining whether the NES applies to the site and whether contamination remediation or management is likely to be required.

The identified potential contaminants evaluated in the conceptual site model (CSM) shown in Table 11 below were limited to a selected suite of heavy metals and PAHs.

Table 11 Conceptual Site Model

Potential Source	Potential Pathways	Potential Receptors	Assessment
Milking shed area in north of 107 Cemetery Road NW corner of shed N of water tank	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Complete for residential health: concentration of arsenic is above applicable residential guidelines but below outdoor worker guidelines
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	Complete for residential health: concentration of arsenic is above applicable residential guidelines but below outdoor worker guidelines
	Inhalation of vapours	Human Health - residential and outdoor worker	Incomplete: arsenic contamination does not present a risk of inhalation of vapours
	Surface water run-off	Ecological receptors – public stormwater and Waterloo Creek	Complete: concentration of zinc is above applicable guidelines
	Migration of groundwater	Ecological receptors – Waterloo Creek	Complete: concentration of zinc is above applicable guidelines
Former shed location on paper road west of 107 Cemetery Road	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Inhalation of vapours/fibres	Human Health - residential and	Potentially complete: asbestos-cement material may release

		outdoor worker	asbestos fibres
	Surface water run-off	Ecological receptors – public stormwater and Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines
	Migration of groundwater	Ecological receptors – Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines
Around shed in NW corner of Lot 3 DP 488814	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Inhalation of vapours/fibres	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Surface water run-off	Ecological receptors – public stormwater and Waterloo Creek	Complete: concentration of zinc is above applicable guidelines
	Migration of groundwater	Ecological receptors – Waterloo Creek	Complete: concentration of zinc is above applicable guidelines
Water tank area in W of house lot at 167 Argent Lane	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Inhalation of vapours	Human Health - residential and outdoor worker	Potentially complete: asbestos-cement material may release asbestos fibres
	Surface water run-off	Ecological receptors – public stormwater and Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines
	Migration of groundwater	Ecological receptors – Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines
Stockyard at 167 Argent Lane	Dermal contact with contaminated soils	Human Health - residential and outdoor worker	Complete for residential health: concentration of arsenic is above applicable residential guidelines but below outdoor worker guidelines
	Ingestion of contaminated soils	Human Health - residential and outdoor worker	Complete for residential health: concentration of arsenic is above applicable residential guidelines

			but below outdoor worker guidelines
	Inhalation of vapours	Human Health - residential and outdoor worker	Incomplete: arsenic contamination does not present a risk of inhalation of vapours
	Surface water run-off	Ecological receptors – public stormwater and Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines
	Migration of groundwater	Ecological receptors – Waterloo Creek	Incomplete: concentrations of contaminants are below applicable guidelines

The conceptual site model based on the sampling carried out to date indicates that it is likely that potential contamination in specific areas of the site will have significant effects on human health or ecological receptors as the source, pathway and receptor linkages are complete or potentially complete.

The presence of identified contamination on site implies that the NES will apply the proposed redevelopment project at the site.

6 Summary and Recommendations

This investigation has evaluated the potential for site contamination due to past and present activities across and around Milldale Stages 10-13 (the site). Additional investigation work was carried out for Lot 1 DP 488814 (107 Cemetery Road) which had not been formally investigated previously.

Previous environmental investigations for the Milldale development covered the bulk of Stages 10-13. Investigations by Tonkin & Taylor did not identify any significant potential environmental issues within the site or in the area immediately surrounding it. Investigation, remediation, and validation carried out by GES in 2023 dealt with uncontrolled fill southeast of Stage 10. Asbestos-containing fibrolite fragments, lead and PAH contamination remain in fill south of Lysnar Road. The contamination to the south of Lysnar Road is highly unlikely to have had any effect on the site.

Historic aerial photographs largely confirmed information from other sources indicating that the site and surrounds were being used primarily for grazing/agricultural activities or were covered in scrub until the 1990s. Farming-related activities/structures included farm sheds, horse dressage areas, and grazing paddocks. A pear orchard was visible to the south of Stage 10 in 1940. Filling in the area south of Lysnar Road and creation of a pond on the unnamed tributary was noted in 1988. Additional review of aerials for this investigation noted the potential for horticulture prior to 1963 within Stage 10 although the evidence was unclear.

Aerial photo review for 107 Cemetery Road confirmed that it had historically been used for pastoral grazing for dairying. Buildings on the property were progressively developed after 1940, with the milking shed on site by 1963. Site development was concentrated around the milking shed and dwelling, with an additional farm building on the adjoining paper road. A small effluent pond was located east of the milking shed and there was a larger pond south of the orchard.

A site contamination enquiry and review of property files for 107 Cemetery Road confirmed the historic dairy farming use and did not reveal any indications of potential contamination.

The walkover inspection identified potential contamination issues as follows:

- Stockyard in the west of Stage 10.
- Potential asbestos-containing material (ACM) and a small shed at 525 Wainui Road (Stage 11).
- Minor rubbish burning (<1 m^2) at 168 Argent Lane.
- Potential ACM cladding on the dwelling at 167 Argent Lane plus potential ACM fragments in stockyard/water tank areas, and rubbish burning (<1 m^2).
- A small effluent pond on Lot 3 DP 488814.
- Potential ACM sheet fragments around the east side of the hay shed in the north-west corner of Lot 3 DP 488814.
- Chemical use within the milking shed at 107 Cemetery Road and an effluent pond downstream of the shed.
- Areas of rubbish burning and potential ACM at the former shed location on the paper road extension of 107 Cemetery Road.
- Potential horticultural chemical use in the household orchard at 107 Cemetery Road.

The small areas of recent rubbish burning are considered to be *de minimus* in terms of potential site contamination effects. This material should however be removed for appropriate off-site disposal prior to any earthworks in the areas.

Soil samples and samples of potential ACM were collected from areas of concern and analysed for potential contaminants. Arsenic contamination above NES residential guidelines was identified at two locations, namely:

- Around the farm shed north of milking shed at 107 Cemetery Road.
- In the former stockyard at 167 Argent Lane.

Zinc contamination above permitted activity criteria for environmental protection was found at two locations:

- Around the farm shed north of milking shed at 107 Cemetery Road.
- South-east corner of the hay shed in the north-west of Lot 3 DP 488814.

Asbestos contamination below the BRANZ soil guideline was found by the south-east corner of the hay shed in the north-west of Lot 3 DP 488814. Asbestos was identified in building materials from the former shed location by 107 Cemetery Road, east of the Lot 3 DP 488814 hay shed, and water tank location at 167 Argent Lane.

The conceptual site model indicates that it is likely that potential contamination in specific areas of the site could have significant effects on human health or ecological receptors as the source, pathway and receptor linkages are complete or potentially complete. The presence of identified contamination means that the NES will apply the proposed redevelopment project at the site. Consent may also be required under the contaminated land provisions of the Auckland Unitary Plan.

Remediation is recommended for contamination at levels above the NES residential guideline values and permitted activity criteria for environmental protection. Remediation of areas containing fragments of ACM is also recommended. Further sampling may also be required around areas of identified contamination to confirm the extent of contamination prior to commencing any remediation.

As with any assessment of this nature, there is always the possibility that additional items not visible during the investigation may be revealed during subsequent investigations or during redevelopment of the site. Any such items should be evaluated by a suitably qualified environmental consultant in accordance with the requirements of Auckland Council.

7 PSI Certifying Statement

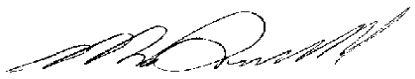
I **Andrew James MacDonald** of Groundwater and Environmental Services certify that:

This detailed site investigation report meets the requirements of the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 because it has been:

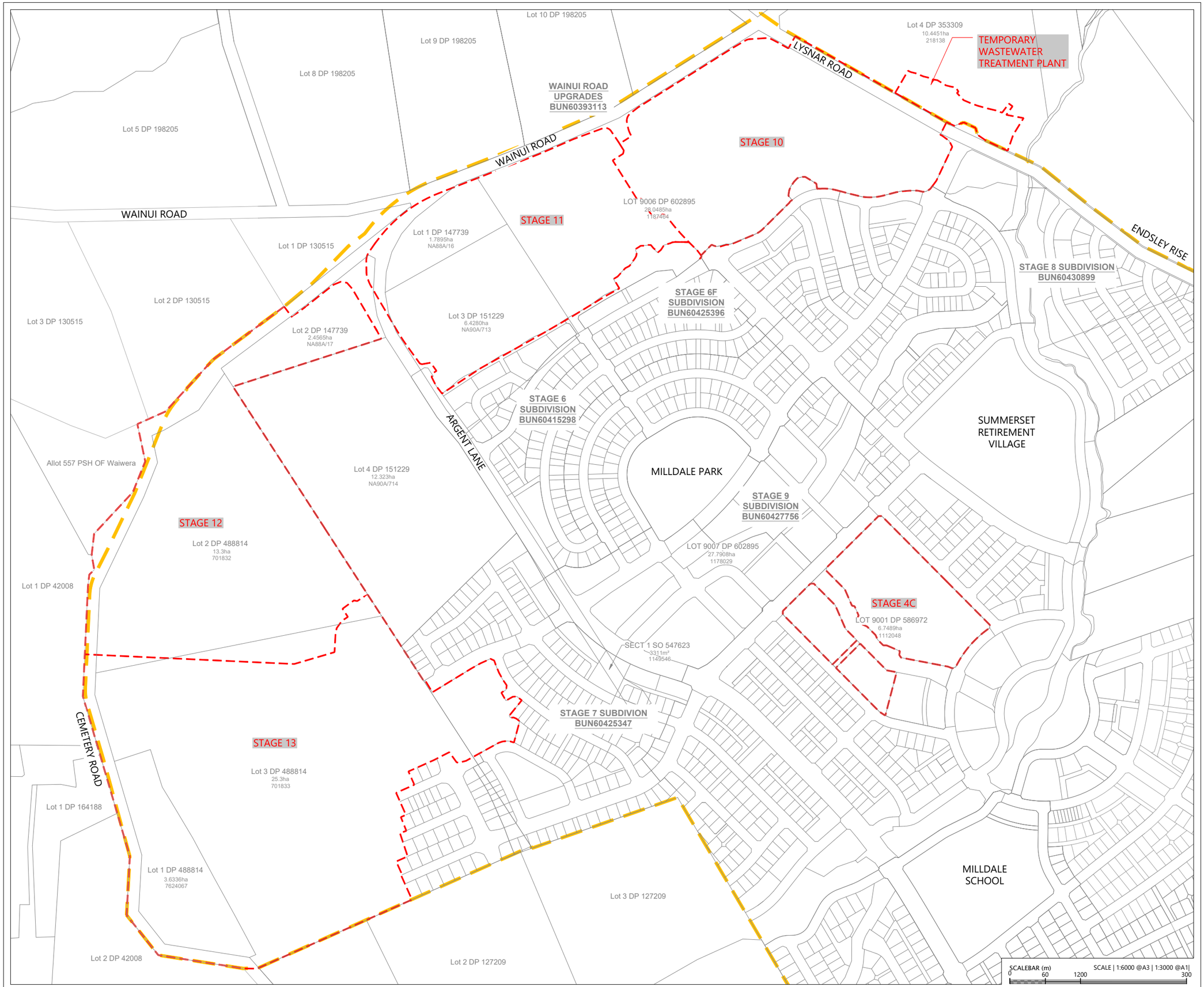
- Carried out by a suitably qualified and experienced practitioner;
- Reported on in accordance with the current edition of Contaminant Land Management Guidelines No 1 – Reporting on Contaminated Sites in New Zealand (June 2021); and
- Certified by a suitably qualified and experienced practitioner.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner who has carried out this investigation and has certified this report is appended to this report in Appendix G.

Signed and dated:



24 February 2025



WOODS
Est.1970

Plot Date: 11:29:33 am,11 December 2024, FATINA

LEGEND:

- WAINUI PRECINCT BOUNDARY
- EXTENTS OF FAST TRACK APPLICATION
- EXISTING/CONSENTED BOUNDARIES

REVISION DETAILS		BY	DATE
1	ISSUED FOR CONSENT	JW	DEC 2024

SURVEYED	WOODS	SIDWELL ROAD WAINUI AUCKLAND
DESIGNED	WOODS	
DRAWN	FA	
CHECKED	JW	
APPROVED	JW	WOODS.CO.NZ

N

MILLDALE
Connecting Lifestyles

MILLDALE FAST TRACK STAGES 10 - 13

EXISTING TITLES PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:6000 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-128-00-0002-GE	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-128 - MDL - FAST TRACK APPLICATION_21627\02 DRAWINGS\01 ENG\P24-128-00-0002-GE-EXISTING TITLES PLAN.DWG

Figure 2: Soil Sample Locations
107 Cemetery Road & Lot 3 DP 488814

0 10 20 30
Meters

Scale @ A4
= 1:2,500

Date Printed:
24/01/2025

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Figure 3: Sample Locations
167 Argent Lane

0 5 10 15
Meters

Scale @ A4
= 1:1,000

Date Printed:
5/11/2024

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Figure 4: Sample Locations
131 Argent Lane

0 10 20 30
Meters

Scale @ A4
= 1:2,500

Date Printed:
24/01/2025

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A
Site Contamination Enquiry Response
107 Cemetery Road

30/10/2024

Groundwater & Environmental Services
PO Box Number:190
Cambridge

Attention: Andrew Macdonald

Dear Andrew,

Site Contamination Enquiry – *107 Cemetery Road, Wainui*

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

There is no contamination information held within Council's records for the site (107 Cemetery Road Wainui).

Due to the age of the dwelling on site the potential for asbestos and/or lead paint may need to be considered.

Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site and results are displayed in Figure 1 below:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities
- Identified HAIL activities

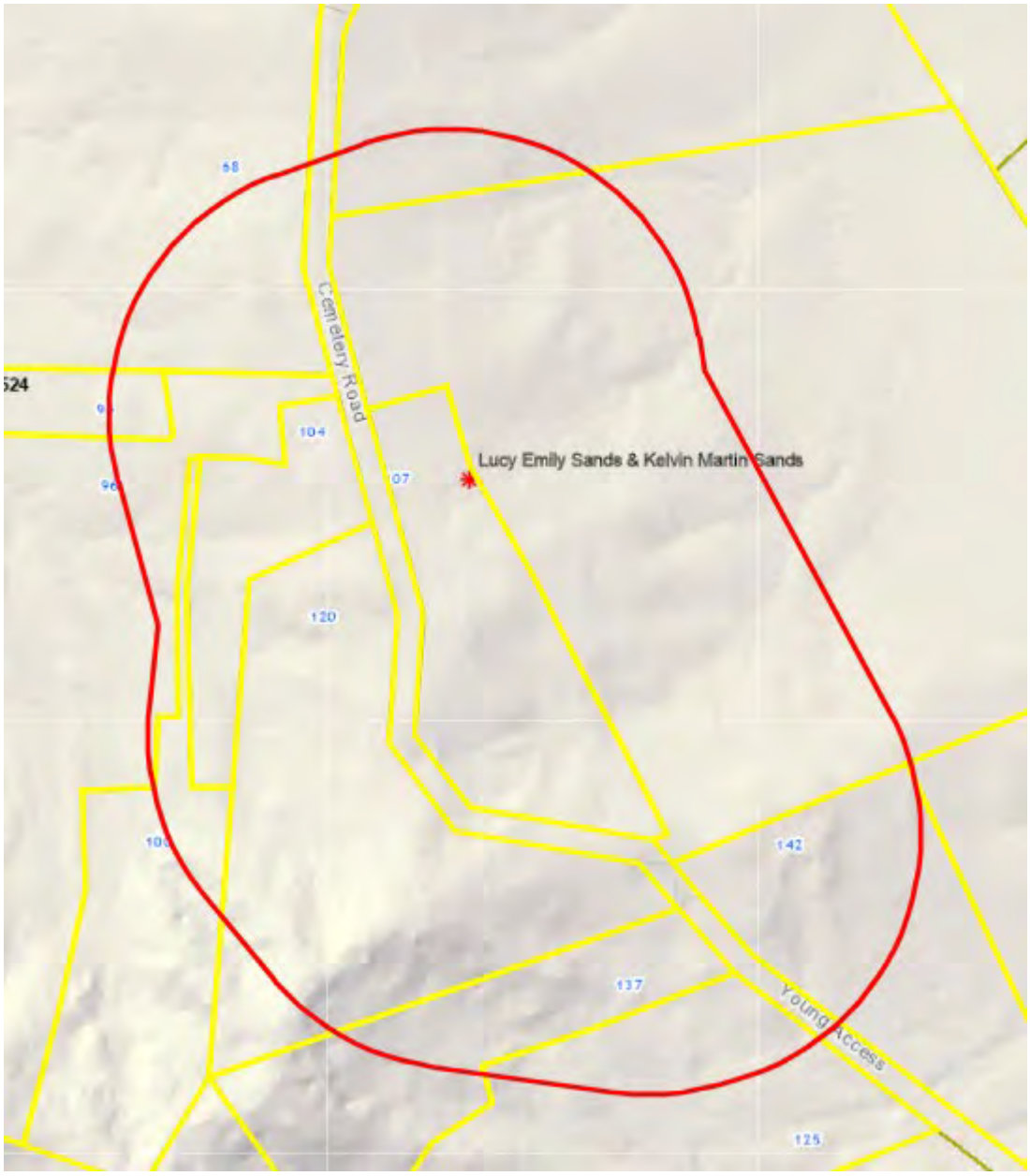


Figure 1: Selected Consents, Incidents and HAIL activities within approximately 200m of the subject site

Legend:

All Consents
All Applications
All Permitted Activities
All Bores
Closed Landfill (Auckland Council owned)
Closed Landfill (Privately owned)
All Incidents
HAIL activities

Relevant details of any pollution incidents and consents and HAIL activities are appended to this letter (Attachment A). Please refer to the column titled ‘Property Address’ on the spreadsheet to aid in identifying corresponding data on the map.

For any identified HAIL sites, please refer to the tab “HAIL activities” for more information (Column C and D include HAIL activity details where these are available).

Please note:

The HAIL activity hatching in Figure 1 only reflects whether a site has been identified as a HAIL site (both verified and non-verified) by the Council and the type of HAIL associated with the site. This does not confirm whether the site has been formally investigated or the contamination status of the property (e.g. contaminated, remediated etc.). Additionally, due to limitations within Council’s records, the specific HAIL activity is not included in the data for all properties. For further information on any of these known HAIL sites, a subsequent site contamination enquiry can be lodged for the specific property (up to 5 adjacent properties can be covered in one request).

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days’ notice to ensure the files will be available).

Please note Auckland Council cost recovers officer’s time for all site enquiries. As such an invoice for the time involved in this enquiry will follow shortly.

Yours Sincerely,

Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council

Appendix B
Previous Investigation Figures

T:\CAD\30868\30868.011\WorkingMaterial\CAD\FIG\30868.011-F2.1.dwg 2020-Jun-25 9:47:00 AM Plotted By: ROSEMARY SUTTON

A3 SCALE 1:7500

0 0.1 0.2 0.3 0.4 (km)

ORIGINAL IN COLOUR

Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

PROJECT No.	30868.011	
DESIGNED	SM	Jun.20
DRAWN	RBS	Jun.20
CHECKED		
APPROVED		DATE

CLIENT **FULTON HOGAN LIMITED**

PROJECT **SITE INVESTIGATION**

TITLE EARTHWORKS 2 & 3
Key Site Features

SCALE (A3) 1:7500 FIG No. Figure 2.1 REV 1

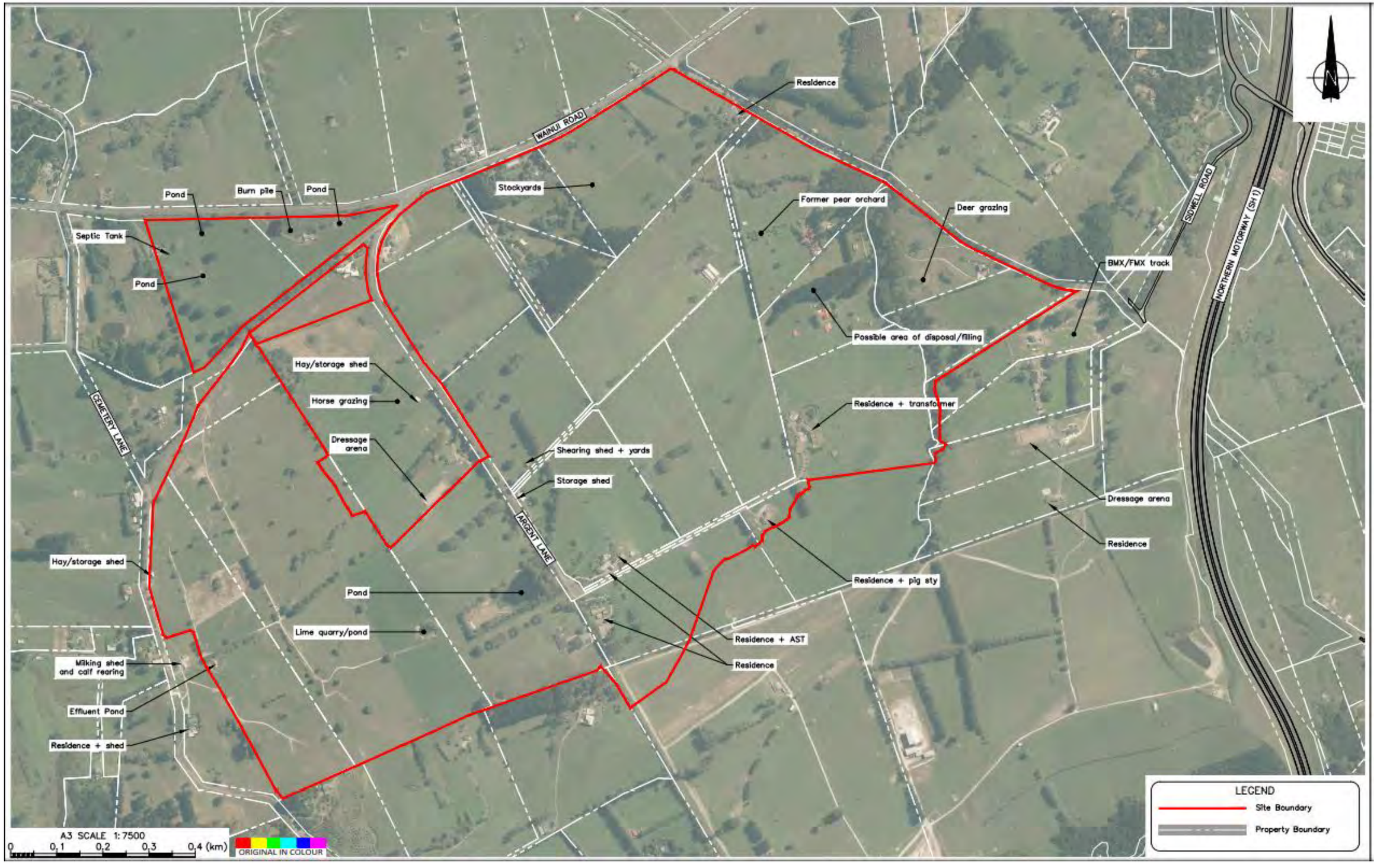
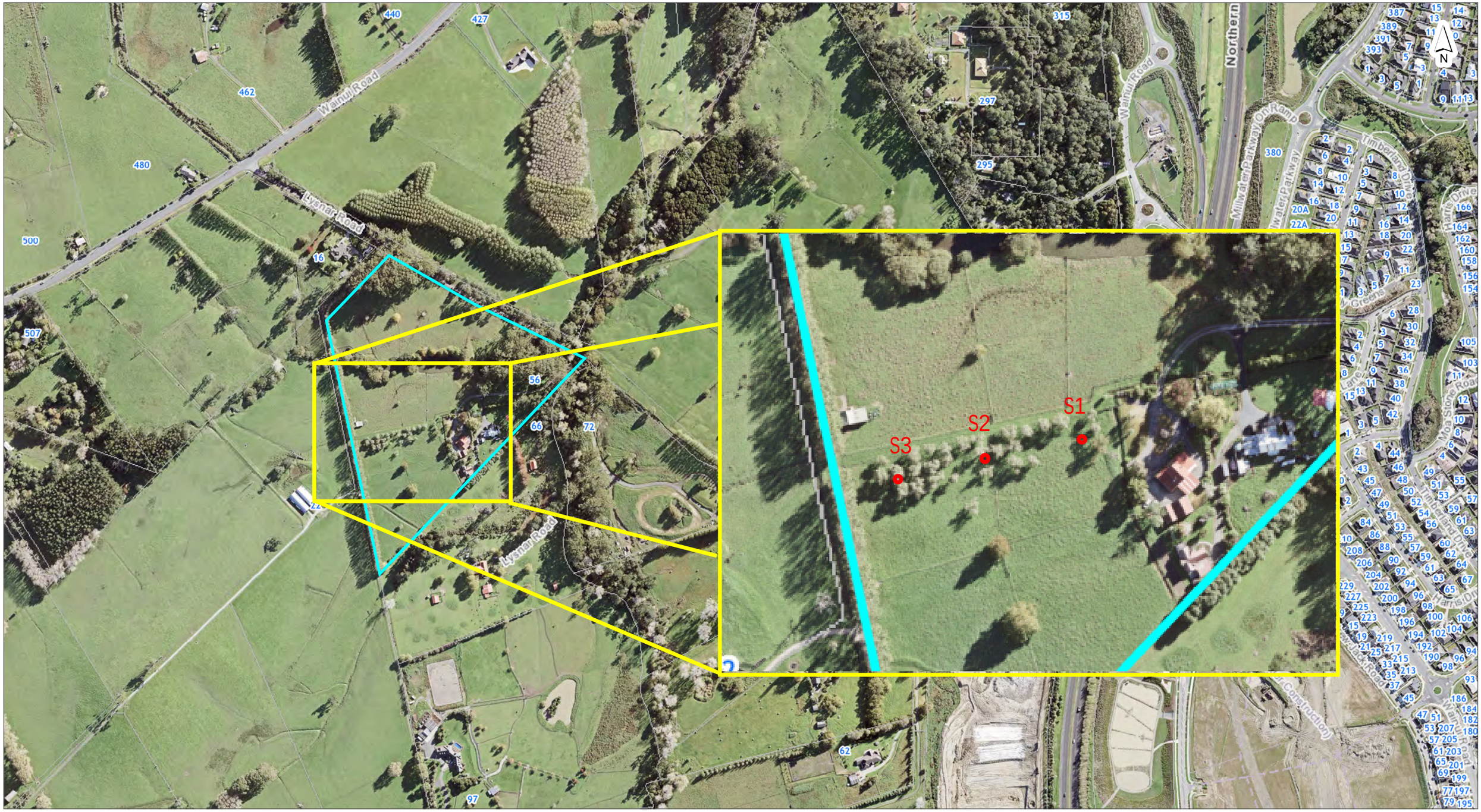


Figure 2.1: Key site features (photograph sourced from Auckland Council GeoMaps):



DISCLAIMER:
This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information.
Height datum: Auckland 1946.

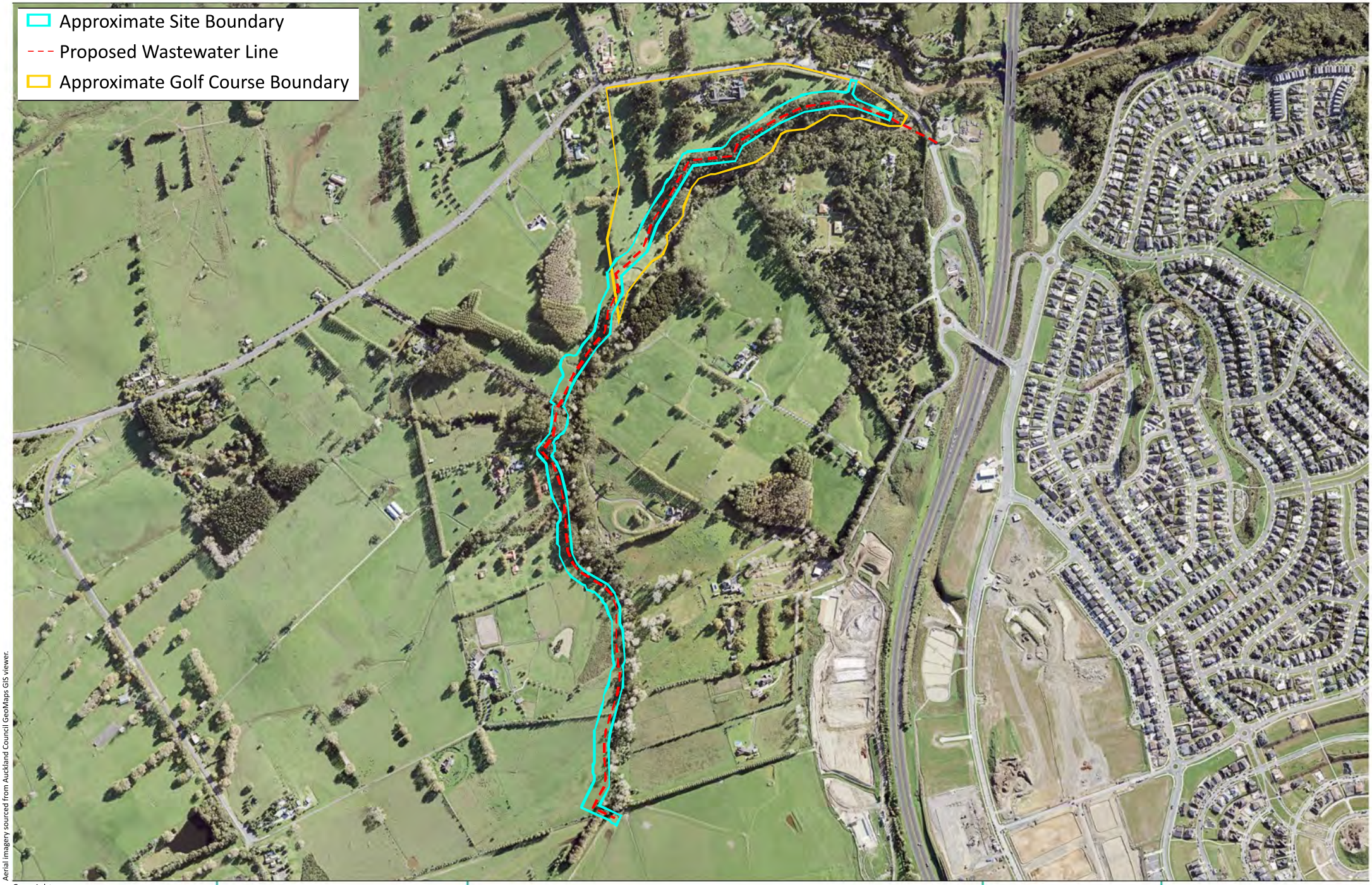
Orchard soil sampling locations

0 50 100 150
Meters

Scale @ A3
= 1:5,000

Date Printed:
4/06/2019

Auckland Council
Te Kaunihera o Tāmaki Makaurau



Aerial imagery sourced from Auckland Council GeoMaps GIS viewer.

N

Scale 1:10,000 @ A4

0 200 400m

AA3835 – Wainui WW DSI

Figure 1: Site Location Plan

Figure prepared for Wood and Partners Consultants by 4Sight Consulting.

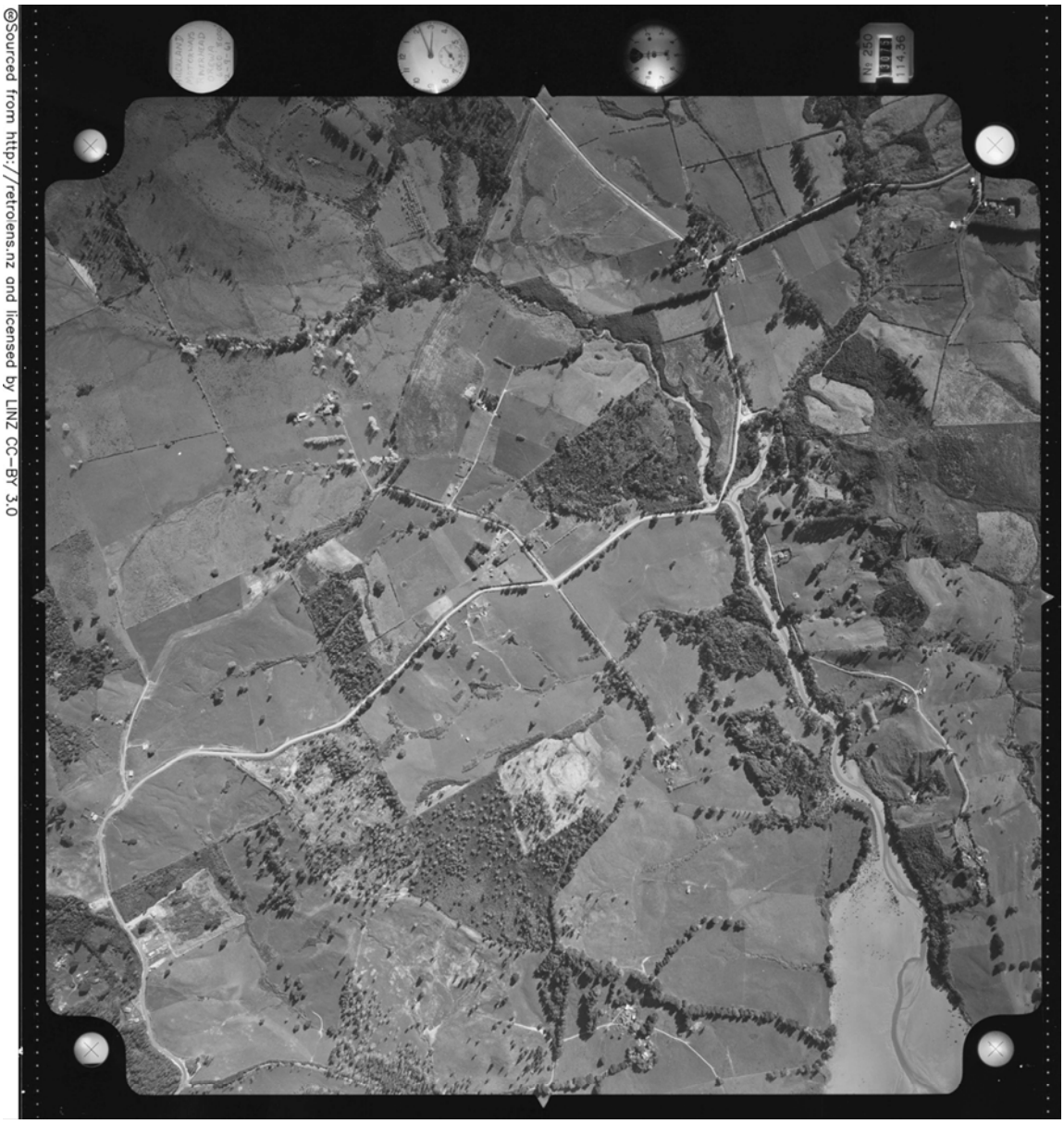
Date: 02/10/2018
Version: 0.4
Drawn: Sam Hendrikse
Checked: Kyle Redshaw
Approved: Nigel Mather

4SIGHT CONSULTING

Appendix C
Historic Aerial Photographs

1940

1961

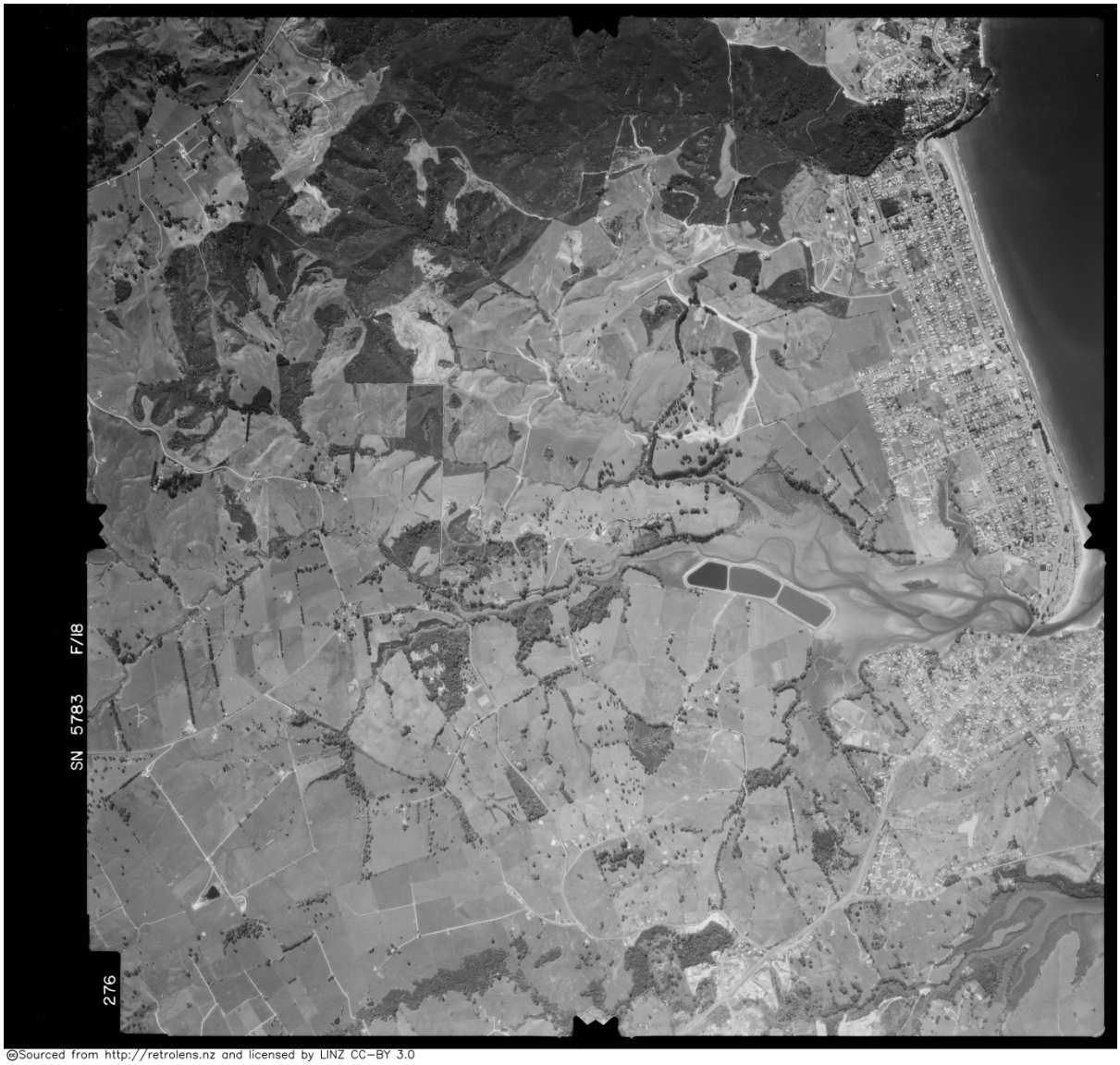


1963

1973


3618
4640/6
©Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0

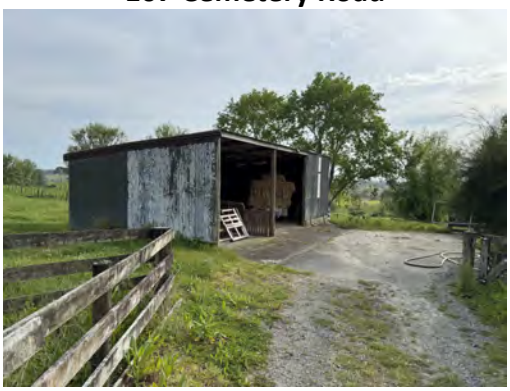
1981



1988

Appendix D
Site Inspection Photographs

107 Cemetery Road



Farm shed north of milking shed

Ramp to milking shed/yard

Water tank by NE corner of farm shed

Yard S of milking shed

Animal shelter N of water tank

Interior of milking shed

Milking shed yard

Interior of milking shed

Chemical containers on milking shed

Rubbish pile of former shed location

Chemical containers in milking shed

Retained area south of former shed

Stockyard in turning area

Disused garage N of dwelling

Former shed location

Shed south of dwelling

Rubbish on ground W of shed

Pond south of orchard

Partially demolished shed/sleepout

Former water tank location

Former household orchard

Effluent pond E of milking shed

Pumpkin shed by pond

2nd effluent pond E of milking shed

Lot 3 DP 488814

Shed in NW corner of Lot 3

South side of shed

Ground on NE corner of shed

Ground on SE corner of shed

Interior of shed

Lot 2 DP 488814

Former dwelling site in SW of Lot 2

Former chimney

Concrete and brick structure

Former concrete water tank

167 Argent Lane

Former shed location

Former stockyard location

View to W across former stockyard

Former cattery

168 Argent Lane

Secondary dwelling

Shed

Former water tank location

Rear of shed

Potential asbestos fibrolite

East side of shed

Dwelling

Water tank

507 Wainui Road

Incinerator residue (<1m^2)

Half-round shed

Wastewater treatment system

Shed/stable

Disused swimming pool

Pond south of dwelling

507A Wainui Road

Cedar weatherboard dwelling

Demolition material

Minor rubbish on bank

East side of dwelling

525 Wainui Road

Shed

Fibrolite shed by stream

Fibrolite shed by stream

Outhouse by stream

Lot 3 DP 151229

View to north

View to west

16 Lysnar Road

Stockyard

Stockyard

Paddocks and west of block

Paddocks consent of block

Shed and water tank

Plastic water tanks

Open bay shed

Household vegetable garden

Appendix E
Sample Descriptions

Sample Name	Depth Range m	Description
107 Cemetery Road		
MDL24001	0-0.15	Medium brown silty soil and gravel to 0.12 m above light grey silty gravel
MDL24002	0.15-0.2	Light grey/white lime gravel
MDL24003	0-0.15	Pond edge downstream of milking shed Light brown silty soil
MDL24004	0.15-0.4	Light grey to light brown mottled silt. Wet at base
MDL24005	0-0.15	North side of corrugated iron shed. Light brown loose silty soil with occasional gravel
MDL24006	0.15-0.3	Medium brown to orange clayey silt
MDL24007	0-0.15	Beside north-west corner of shed – north of water tank. Light to medium brown silt with occasional light grey gravel
MDL24008	0.15-0.3	Medium Brown weakly clayey silt with occasional orange patches
MDL24009	0-0.15	Mid orchard. Medium brown loose silty soil
MDL24010	0.15-0.3	Medium brown silt to orange brown silt to light grey/white silt at the base
MDL24011	-	Fibrolite sheet (thicker) with hatch pattern. Possible electric board.
MDL24012	-	Fibrolite sheet (corrugated) – cladding
Lot 3 DP 488814		
MDL24013	-	Fibrolite sheet piece from area by concrete trough near north-east corner of shed
MDL24014	-	Fibrolite sheet piece from ground by south-east corner of shed.
MDL24015	0-0.15	North-east corner of shed. Medium brown silty soil and gravel with rare glass fragments
MDL24016	0-0.15	South-east corner of shed. Medium brown silty soil with occasional gravel with larger gravel towards the base
MDL24017	0-0.15	Medium brown silty soil with occasional gravel
MDL24018	0.15-0.3	Light brown silt over mottled light brown to orange silt with rare peaty patches
167 Argent Lane		
MDL24019	-	Fibrolite flat sheet – on ground by concrete pad
MDL24020	-	Painted fibrolite sheet piece by septic tank
MDL24021	0-0.1	Former covered yard area Medium greyish brown silty soil
MDL24022	0.1-0.25	Medium orange brown silty clay
MDL24023	0-0.15	Medium to dark brown silty soil with rare gravel
MDL24024	0.15-0.25	White lime chip rock. Refusal at 0.25 m
131 Argent Lane - Stockyard		
MDL24025	0-0.15	Stockyard Medium brown silty soil
MDL24026	0-0.15	Duplicate of 025
MDL24027	0.15-0.3	Light grey clayey silt to silty clay to 0.18 m over medium orange

		silty clay
MDL24028	0-0.1	Stockyard Medium brown silty soil
MDL24029	0.1-0.3	Very light grey mottled silt to 0.18 m over medium orange silty clay
131 Argent Lane - Paddocks		
MDL24030	0-0.15	Medium brown silty soil with minor orange silt patches
MDL24031	0.15-0.3	Medium orange brown weakly clayey silt
MDL24032	0-0.15	Medium brown silty soil
MDL24033	0.15-0.3	Medium brown to orange silt with weak clay over medium orange brown silty clay
MDL24034	0-0.15	Medium brown silty soil
MDL24035	0.15-0.3	Light brown to orange brown silt becoming more orange and clayey with depth
MDL24036	0-0.15	Medium brown silty soil to medium greyish brown silt
MDL24037	0.15-0.3	Mottled grey and orange silt over light grey to orange silty clay
MDL24038	0-0.15	Light to medium greyish brown loose silty soil
MDL24039	0.15-0.3	Medium orange brown silty clay
MDL24040	0-0.15	Light to medium greyish brown loose silty soil
MDL24041	0.15-0.3	Light to medium orange brown silty clay
MDL24042	0-0.15	Duplicate of 040
MDL24043	0-0.15	Light to medium greyish brown silty soil to mottled silt at base
MDL24044	0.15-0.3	Light grey to slightly orange mottled silt. Mixture of light brown and medium orange clayey silt at the base
MDL24045	0-0.15	Light to medium greyish brown silty soil to silt
MDL24046	0.15-0.3	Light brown to orange silt. Becomes clayey silt at base
MDL24047	0-0.15	Medium brown silty soil to silt
MDL24048	0.15-0.3	Light grey to white silt (5 cm) over medium orange brown clayey silt
MDL24049	0-0.15	Medium brown loose silty soil to silt
MDL24050	0-0.15	Duplicate of 049
MDL24051	0.15-0.3	Medium orange brown weakly clayey silt

Appendix F
Laboratory Analytical Reports

R J Hill Laboratories Limited
Level 3, 204 Thorndon Quay
Pipitea
Wellington 6011 New Zealand

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

Certificate of Analysis

Client:	Groundwater & Environmental Services	**Lab No:**	3711037	A2Pv1
Contact:	Mr A MacDonald	**Date Received:**	07-Nov-2024	
	C/- Groundwater & Environmental Services	**Date Reported:**	12-Nov-2024	
	PO Box 190	**Quote No:**	82855	
	Cambridge 3450	**Order No:**		
		Client Reference:	Milldale	
		Add. Client Ref:	Date sampled: 06/11/24	
		Submitted By:	Mr A MacDonald	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category*	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
MDL24011	3711037.1	Fibre Cement	57.52	Chrysotile (White Asbestos) detected. Unknown mineral fibres detected (see below).	N/A
MDL24012	3711037.2	Fibre Cement	17.53	Asbestos NOT detected. Organic fibres detected.	N/A
MDL24013	3711037.3	Fibre Cement	40.93	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.	N/A
MDL24014	3711037.4	Fibre Cement	5.22	Chrysotile (White Asbestos) detected.	N/A
MDL24019	3711037.5	Fibre Cement	13.39	Asbestos NOT detected. Organic fibres detected.	N/A
MDL24020	3711037.6	Fibre Cement	25.50	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected. Organic fibres detected.	N/A

Glossary of Terms

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

For further details, please contact the Asbestos Team.

Summary of Methods

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

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category*	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington.	-	1-6
Sample Weight on receipt	Sample weight (approximate). Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington.	0.01 g	1-6
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-6
Description of Asbestos in Non Homogeneous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-6

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

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

Testing was completed on 12-Nov-2024. For completion dates of individual analyses please contact the laboratory.

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

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

Zandra Fenton BSc
Team Leader - Asbestos

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
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Certificate of Analysis

Client:	Groundwater & Environmental Services	**Lab No:**	3711038	SPv3
Contact:	Mr A MacDonald	**Date Received:**	07-Nov-2024	
	C/- Groundwater & Environmental Services	**Date Reported:**	18-Dec-2024	**(Amended)**
	PO Box 190	**Quote No:**	82855	
	Cambridge 3450	**Order No:**		
		Client Reference:	MILLDALE	
		Submitted By:	Mr A MacDonald	

Sample Type: Soil

Sample Name:		MDL24001 06-Nov-2024	MDL24003 06-Nov-2024	MDL24005 06-Nov-2024	MDL24007 06-Nov-2024	MDL24009 06-Nov-2024
Lab Number:		3711038.1	3711038.2	3711038.3	3711038.4	3711038.5
Individual Tests						
Dry Matter	g/100g as rcvd	64	74	-	81	83
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	2	2	2	53	3
Total Recoverable Cadmium	mg/kg dry wt	0.20	< 0.10	0.16	0.83	0.61
Total Recoverable Chromium	mg/kg dry wt	7	7	6	27	7
Total Recoverable Copper	mg/kg dry wt	38	52	8	63	5
Total Recoverable Lead	mg/kg dry wt	9.6	6.8	7.1	20	20
Total Recoverable Nickel	mg/kg dry wt	9	17	6	20	2
Total Recoverable Zinc	mg/kg dry wt	131	49	45	450	47
Multiresidue Pesticides in Soil samples by GCMS						
Acetochlor	mg/kg dry wt	-	-	-	-	< 0.009
Alachlor	mg/kg dry wt	-	-	-	-	< 0.006
Aldrin	mg/kg dry wt	-	-	-	-	< 0.012
Atrazine	mg/kg dry wt	-	-	-	-	< 0.009
Atrazine-desethyl	mg/kg dry wt	-	-	-	-	< 0.009
Atrazine-desisopropyl	mg/kg dry wt	-	-	-	-	< 0.017
Azaconazole	mg/kg dry wt	-	-	-	-	< 0.005
Azinphos-methyl	mg/kg dry wt	-	-	-	-	< 0.017
Benalaxyl	mg/kg dry wt	-	-	-	-	< 0.005
Bendiocarb	mg/kg dry wt	-	-	-	-	< 0.009
Benodanil	mg/kg dry wt	-	-	-	-	< 0.017
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.012
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.012
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.012
Bifenthrin	mg/kg dry wt	-	-	-	-	< 0.005
Bitertanol	mg/kg dry wt	-	-	-	-	< 0.017
Bromacil	mg/kg dry wt	-	-	-	-	< 0.009
Bromophos-ethyl	mg/kg dry wt	-	-	-	-	< 0.009
Bromopropylate	mg/kg dry wt	-	-	-	-	< 0.009
Bupirimate	mg/kg dry wt	-	-	-	-	< 0.009
Buprofezin	mg/kg dry wt	-	-	-	-	< 0.009
Butachlor	mg/kg dry wt	-	-	-	-	< 0.009
Captafol	mg/kg dry wt	-	-	-	-	< 0.05
Captan	mg/kg dry wt	-	-	-	-	< 0.017
Carbaryl	mg/kg dry wt	-	-	-	-	< 0.009
Carbofenothion	mg/kg dry wt	-	-	-	-	< 0.009
Carbofuran	mg/kg dry wt	-	-	-	-	< 0.009

Sample Type: Soil						
Sample Name:		MDL24001 06-Nov-2024	MDL24003 06-Nov-2024	MDL24005 06-Nov-2024	MDL24007 06-Nov-2024	MDL24009 06-Nov-2024
Lab Number:		3711038.1	3711038.2	3711038.3	3711038.4	3711038.5
Multiresidue Pesticides in Soil samples by GCMS						
cis-Chlordane	mg/kg dry wt	-	-	-	-	< 0.012
trans-Chlordane	mg/kg dry wt	-	-	-	-	< 0.012
Chlorfenvinphos	mg/kg dry wt	-	-	-	-	< 0.012
Chlorfluazuron	mg/kg dry wt	-	-	-	-	< 0.009
Chlorothalonil	mg/kg dry wt	-	-	-	-	< 0.009
Chlorpropham	mg/kg dry wt	-	-	-	-	< 0.017
Chlorpyrifos	mg/kg dry wt	-	-	-	-	< 0.009
Chlorpyrifos-methyl	mg/kg dry wt	-	-	-	-	< 0.009
Chlortoluron	mg/kg dry wt	-	-	-	-	< 0.017
Chlozolinate	mg/kg dry wt	-	-	-	-	< 0.009
Coumaphos	mg/kg dry wt	-	-	-	-	< 0.017
Cyanazine	mg/kg dry wt	-	-	-	-	< 0.009
Cyfluthrin	mg/kg dry wt	-	-	-	-	< 0.011
Cyhalothrin	mg/kg dry wt	-	-	-	-	< 0.009
Cypermethrin	mg/kg dry wt	-	-	-	-	< 0.03
Cyproconazole	mg/kg dry wt	-	-	-	-	< 0.017
Cyprodinil	mg/kg dry wt	-	-	-	-	< 0.009
2,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.012
2,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.012
2,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.012
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.012
Total DDT Isomers	mg/kg dry wt	-	-	-	-	< 0.08
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	-	-	-	< 0.009
Diazinon	mg/kg dry wt	-	-	-	-	< 0.005
Dichlobenil	mg/kg dry wt	-	-	-	-	< 0.009
Dichlofenthion	mg/kg dry wt	-	-	-	-	< 0.009
Dichlofluanid	mg/kg dry wt	-	-	-	-	< 0.009
Dichloran	mg/kg dry wt	-	-	-	-	< 0.03
Dichlorvos	mg/kg dry wt	-	-	-	-	< 0.010
Dicofol	mg/kg dry wt	-	-	-	-	< 0.05
Dicrotophos	mg/kg dry wt	-	-	-	-	< 0.009
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.012
Difenoconazole	mg/kg dry wt	-	-	-	-	< 0.012
Dimethoate	mg/kg dry wt	-	-	-	-	< 0.017
Dinocap	mg/kg dry wt	-	-	-	-	< 0.10
Diphenylamine	mg/kg dry wt	-	-	-	-	< 0.017
Diuron	mg/kg dry wt	-	-	-	-	< 0.009
Endosulfan I	mg/kg dry wt	-	-	-	-	< 0.012
Endosulfan II	mg/kg dry wt	-	-	-	-	< 0.012
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 0.012
Endrin	mg/kg dry wt	-	-	-	-	< 0.012
Endrin aldehyde	mg/kg dry wt	-	-	-	-	< 0.012
Endrin ketone	mg/kg dry wt	-	-	-	-	< 0.012
EPN	mg/kg dry wt	-	-	-	-	< 0.009
Ethion	mg/kg dry wt	-	-	-	-	< 0.009
Etrimfos	mg/kg dry wt	-	-	-	-	< 0.009
Famphur	mg/kg dry wt	-	-	-	-	< 0.009
Fenarimol	mg/kg dry wt	-	-	-	-	< 0.009
Fenitrothion	mg/kg dry wt	-	-	-	-	< 0.009
Fenpropathrin	mg/kg dry wt	-	-	-	-	< 0.009
Fenpropimorph	mg/kg dry wt	-	-	-	-	< 0.009
Fensulfothion	mg/kg dry wt	-	-	-	-	< 0.009

Sample Type: Soil							
Sample Name:		MDL24001 06-Nov-2024	MDL24003 06-Nov-2024	MDL24005 06-Nov-2024	MDL24007 06-Nov-2024	MDL24009 06-Nov-2024
Lab Number:		3711038.1	3711038.2	3711038.3	3711038.4	3711038.5
Multiresidue Pesticides in Soil samples by GCMS						
Fenvalerate (including Esfenvalerate)	mg/kg dry wt	-	-	-	-	< 0.012
Fluazifop-butyl	mg/kg dry wt	-	-	-	-	< 0.009
Fluometuron	mg/kg dry wt	-	-	-	-	< 0.009
Flusilazole	mg/kg dry wt	-	-	-	-	< 0.009
Fluvalinate	mg/kg dry wt	-	-	-	-	< 0.006
Folpet	mg/kg dry wt	-	-	-	-	< 0.017
Furalaxyl	mg/kg dry wt	-	-	-	-	< 0.005
Haloxyfop-methyl	mg/kg dry wt	-	-	-	-	< 0.009
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.012
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.012
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.012
Hexaconazole	mg/kg dry wt	-	-	-	-	< 0.009
Hexazinone	mg/kg dry wt	-	-	-	-	< 0.005
Hexythiazox	mg/kg dry wt	-	-	-	-	< 0.05
Imazalil	mg/kg dry wt	-	-	-	-	< 0.05
Indoxacarb	mg/kg dry wt	-	-	-	-	< 0.009
Iodofenphos	mg/kg dry wt	-	-	-	-	< 0.009
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	-	-	-	< 0.05
Isazophos	mg/kg dry wt	-	-	-	-	< 0.009
Isofenphos	mg/kg dry wt	-	-	-	-	< 0.005
Kresoxim-methyl	mg/kg dry wt	-	-	-	-	< 0.005
Leptophos	mg/kg dry wt	-	-	-	-	< 0.009
Linuron	mg/kg dry wt	-	-	-	-	< 0.009
Malathion	mg/kg dry wt	-	-	-	-	< 0.009
Metalaxyl	mg/kg dry wt	-	-	-	-	< 0.009
Methacrifos	mg/kg dry wt	-	-	-	-	< 0.009
Methamidophos	mg/kg dry wt	-	-	-	-	< 0.05
Methidathion	mg/kg dry wt	-	-	-	-	< 0.009
Methiocarb	mg/kg dry wt	-	-	-	-	< 0.009
Methoxychlor	mg/kg dry wt	-	-	-	-	< 0.012
Metolachlor	mg/kg dry wt	-	-	-	-	< 0.006
Metribuzin	mg/kg dry wt	-	-	-	-	< 0.009
Mevinphos	mg/kg dry wt	-	-	-	-	< 0.017
Molinate	mg/kg dry wt	-	-	-	-	< 0.017
Myclobutanil	mg/kg dry wt	-	-	-	-	< 0.009
Naled	mg/kg dry wt	-	-	-	-	< 0.05
Nitrofen	mg/kg dry wt	-	-	-	-	< 0.017
Nitrothal-isopropyl	mg/kg dry wt	-	-	-	-	< 0.009
Norflurazon	mg/kg dry wt	-	-	-	-	< 0.017
Omethoate	mg/kg dry wt	-	-	-	-	< 0.05
Oxadiazon	mg/kg dry wt	-	-	-	-	< 0.009
Oxychlordane	mg/kg dry wt	-	-	-	-	< 0.005
Oxyfluorfen	mg/kg dry wt	-	-	-	-	< 0.005
Paclobutrazol	mg/kg dry wt	-	-	-	-	< 0.009
Parathion-ethyl	mg/kg dry wt	-	-	-	-	< 0.009
Parathion-methyl	mg/kg dry wt	-	-	-	-	< 0.009
Penconazole	mg/kg dry wt	-	-	-	-	< 0.009
Pendimethalin	mg/kg dry wt	-	-	-	-	< 0.009
Permethrin	mg/kg dry wt	-	-	-	-	< 0.003
Phosmet	mg/kg dry wt	-	-	-	-	< 0.009
Phosphamidon	mg/kg dry wt	-	-	-	-	< 0.009
Pirimicarb	mg/kg dry wt	-	-	-	-	< 0.009
Pirimiphos-methyl	mg/kg dry wt	-	-	-	-	< 0.009

Sample Type: Soil						
Sample Name:		MDL24001 06-Nov-2024	MDL24003 06-Nov-2024	MDL24005 06-Nov-2024	MDL24007 06-Nov-2024	MDL24009 06-Nov-2024
Lab Number:		3711038.1	3711038.2	3711038.3	3711038.4	3711038.5
Multiresidue Pesticides in Soil samples by GCMS						
Prochloraz	mg/kg dry wt	-	-	-	-	< 0.05
Procymidone	mg/kg dry wt	-	-	-	-	< 0.009
Prometryn	mg/kg dry wt	-	-	-	-	< 0.005
Propachlor	mg/kg dry wt	-	-	-	-	< 0.009
Propanil	mg/kg dry wt	-	-	-	-	< 0.03
Propazine	mg/kg dry wt	-	-	-	-	< 0.005
Propetamphos	mg/kg dry wt	-	-	-	-	< 0.009
Propham	mg/kg dry wt	-	-	-	-	< 0.009
Propiconazole	mg/kg dry wt	-	-	-	-	< 0.006
Prothiofos	mg/kg dry wt	-	-	-	-	< 0.009
Pyrazophos	mg/kg dry wt	-	-	-	-	< 0.009
Pyrifenox	mg/kg dry wt	-	-	-	-	< 0.012
Pyrimethanil	mg/kg dry wt	-	-	-	-	< 0.009
Pyriproxyfen	mg/kg dry wt	-	-	-	-	< 0.009
Quintozene	mg/kg dry wt	-	-	-	-	< 0.017
Quizalofop-ethyl	mg/kg dry wt	-	-	-	-	< 0.009
Simazine	mg/kg dry wt	-	-	-	-	< 0.009
Simetryn	mg/kg dry wt	-	-	-	-	< 0.009
Sulfentrazone	mg/kg dry wt	-	-	-	-	< 0.05
Sulfotep	mg/kg dry wt	-	-	-	-	< 0.009
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	-	-	-	-	< 0.017
Tebuconazole	mg/kg dry wt	-	-	-	-	< 0.009
Tebufenpyrad	mg/kg dry wt	-	-	-	-	< 0.005
Terbacil	mg/kg dry wt	-	-	-	-	< 0.009
Terbumeton	mg/kg dry wt	-	-	-	-	< 0.009
Terbuthylazine	mg/kg dry wt	-	-	-	-	< 0.005
Terbuthylazine-desethyl	mg/kg dry wt	-	-	-	-	< 0.009
Terbutryn	mg/kg dry wt	-	-	-	-	< 0.009
Tetrachlorvinphos	mg/kg dry wt	-	-	-	-	< 0.009
Thiabendazole	mg/kg dry wt	-	-	-	-	< 0.05
Thiobencarb	mg/kg dry wt	-	-	-	-	< 0.009
Tolylfluanid	mg/kg dry wt	-	-	-	-	< 0.005
Triadimefon	mg/kg dry wt	-	-	-	-	< 0.009
Triazophos	mg/kg dry wt	-	-	-	-	< 0.009
Trifluralin	mg/kg dry wt	-	-	-	-	< 0.009
Vinclozolin	mg/kg dry wt	-	-	-	-	< 0.009
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	-	< 0.3	-
1-Methylnaphthalene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
2-Methylnaphthalene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Acenaphthylene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Acenaphthene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Anthracene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[a]anthracene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.038	< 0.032	-	< 0.029	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.037	< 0.032	-	< 0.029	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[e]pyrene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Chrysene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-

Sample Type: Soil						
Sample Name:		MDL24001 06-Nov-2024	MDL24003 06-Nov-2024	MDL24005 06-Nov-2024	MDL24007 06-Nov-2024	MDL24009 06-Nov-2024
Lab Number:		3711038.1	3711038.2	3711038.3	3711038.4	3711038.5
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Fluoranthene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Fluorene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Naphthalene	mg/kg dry wt	< 0.08	< 0.07	-	< 0.06	-
Perylene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Phenanthrene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-
Pyrene	mg/kg dry wt	< 0.016	< 0.014	-	< 0.012	-

Sample Name:		MDL24017 06-Nov-2024	MDL24021 06-Nov-2024	MDL24023 06-Nov-2024	MDL24025 06-Nov-2024	MDL24026 06-Nov-2024
Lab Number:		3711038.6	3711038.7	3711038.8	3711038.9	3711038.10
Individual Tests						
Dry Matter	g/100g as rcvd	70	73	73	64	65
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	29	3	3
Total Recoverable Cadmium	mg/kg dry wt	0.55	0.19	0.28	0.12	0.15
Total Recoverable Chromium	mg/kg dry wt	10	6	27	5	5
Total Recoverable Copper	mg/kg dry wt	41	10	50	5	6
Total Recoverable Lead	mg/kg dry wt	41	9.6	14.5	3.9	4.2
Total Recoverable Nickel	mg/kg dry wt	15	8	11	< 2	< 2
Total Recoverable Zinc	mg/kg dry wt	730	49	160	27	29
Multiresidue Pesticides in Soil samples by GCMS						
Acetochlor	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Alachlor	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	< 0.006
Aldrin	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Atrazine	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Atrazine-desethyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Atrazine-desisopropyl	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Azaconazole	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Azinphos-methyl	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Benalaxyl	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Bendiocarb	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Benodanil	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
alpha-BHC	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
beta-BHC	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
delta-BHC	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Bifenthrin	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Bitertanol	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Bromacil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Bromophos-ethyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Bromopropylate	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Bupirimate	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Buprofezin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Butachlor	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Captafol	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Captan	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Carbaryl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Carbofenothion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Carbofuran	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
cis-Chlordane	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
trans-Chlordane	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Chlorfenvinphos	mg/kg dry wt	-	< 0.013	< 0.013	< 0.015	< 0.015
Chlorfluazuron	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Chlorothalonil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011

Sample Type: Soil						
Sample Name:		MDL24017 06-Nov-2024	MDL24021 06-Nov-2024	MDL24023 06-Nov-2024	MDL24025 06-Nov-2024	MDL24026 06-Nov-2024
Lab Number:		3711038.6	3711038.7	3711038.8	3711038.9	3711038.10
Multiresidue Pesticides in Soil samples by GCMS						
Chlorpropham	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Chlorpyrifos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Chlorpyrifos-methyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Chlortoluron	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Chlozolinate	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Coumaphos	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Cyanazine	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Cyfluthrin	mg/kg dry wt	-	< 0.012	< 0.012	< 0.013	< 0.013
Cyhalothrin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Cypermethrin	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	< 0.03
Cyproconazole	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Cyprodinil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
2,4'-DDD	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
4,4'-DDD	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
2,4'-DDE	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
4,4'-DDE	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
2,4'-DDT	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
4,4'-DDT	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Total DDT Isomers	mg/kg dry wt	-	< 0.08	< 0.08	< 0.10	< 0.10
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Diazinon	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Dichlobenil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Dichlofenthion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Dichlofluanid	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Dichloran	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	< 0.03
Dichlorvos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Dicofol	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Dicrotophos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Dieldrin	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Difenoconazole	mg/kg dry wt	-	< 0.013	< 0.013	< 0.015	< 0.015
Dimethoate	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Dinocap	mg/kg dry wt	-	< 0.11	< 0.11	< 0.12	< 0.12
Diphenylamine	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Diuron	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Endosulfan I	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Endosulfan II	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Endosulfan sulphate	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Endrin	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Endrin aldehyde	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Endrin ketone	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
EPN	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Ethion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Etrimfos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Famphur	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fenarimol	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fenitrothion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fenpropathrin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fenpropimorph	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fensulfothion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fenvalerate (including Esfenvalerate)	mg/kg dry wt	-	< 0.013	< 0.013	< 0.015	< 0.015
Fluazifop-butyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Fluometuron	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Flusilazole	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011

Sample Type: Soil						
Sample Name:		MDL24017 06-Nov-2024	MDL24021 06-Nov-2024	MDL24023 06-Nov-2024	MDL24025 06-Nov-2024	MDL24026 06-Nov-2024
Lab Number:		3711038.6	3711038.7	3711038.8	3711038.9	3711038.10
Multiresidue Pesticides in Soil samples by GCMS						
Fluvalinate	mg/kg dry wt	-	< 0.007	< 0.007	< 0.008	< 0.008
Folpet	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Furalaxyl	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Haloxyfop-methyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Heptachlor	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Heptachlor epoxide	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Hexachlorobenzene	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Hexaconazole	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Hexazinone	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Hexythiazox	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Imazalil	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Indoxacarb	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Iodofenphos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Isazophos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Isofenphos	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Kresoxim-methyl	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Leptophos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Linuron	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Malathion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Metalaxyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Methacrifos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Methamidophos	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Methidathion	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Methiocarb	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Methoxychlor	mg/kg dry wt	-	< 0.014	< 0.014	< 0.016	< 0.016
Metolachlor	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	< 0.006
Metribuzin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Mevinphos	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Molinate	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Myclobutanil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Naled	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Nitrofen	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Nitrothal-isopropyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Norflurazon	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Omethoate	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Oxadiazon	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Oxychlordane	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Oxyfluorfen	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Paclobutrazol	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Parathion-ethyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Parathion-methyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Penconazole	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pendimethalin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Permethrin	mg/kg dry wt	-	< 0.003	< 0.003	< 0.003	< 0.003
Phosmet	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Phosphamidon	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pirimicarb	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pirimiphos-methyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Prochloraz	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Procymidone	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Prometryn	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Propachlor	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Propanil	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	< 0.03

Sample Type: Soil						
Sample Name:		MDL24017 06-Nov-2024	MDL24021 06-Nov-2024	MDL24023 06-Nov-2024	MDL24025 06-Nov-2024	MDL24026 06-Nov-2024
Lab Number:		3711038.6	3711038.7	3711038.8	3711038.9	3711038.10
Multiresidue Pesticides in Soil samples by GCMS						
Propazine	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Propetamphos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Propham	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Propiconazole	mg/kg dry wt	-	< 0.007	< 0.007	< 0.008	< 0.008
Prothiofos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pyrazophos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pyrifenox	mg/kg dry wt	-	< 0.013	< 0.013	< 0.015	< 0.015
Pyrimethanil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Pyriproxyfen	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Quintozene	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Quizalofop-ethyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Simazine	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Simetryn	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Sulfentrazone	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Sulfotep	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	-	< 0.019	< 0.019	< 0.03	< 0.03
Tebuconazole	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Tebufenpyrad	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Terbacil	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Terbumeton	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Terbuthylazine	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Terbuthylazine-desethyl	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Terbutryn	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Tetrachlorvinphos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Thiabendazole	mg/kg dry wt	-	< 0.05	< 0.05	< 0.06	< 0.06
Thiobencarb	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Tolylfluanid	mg/kg dry wt	-	< 0.005	< 0.005	< 0.006	< 0.006
Triadimefon	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Triazophos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Trifluralin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Vinclozolin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.011	< 0.011
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.014	-	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014	-	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.014	-	-	-	-
Acenaphthene	mg/kg dry wt	< 0.014	-	-	-	-
Anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.034	-	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.034	-	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.014	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Chrysene	mg/kg dry wt	< 0.014	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.014	-	-	-	-
Fluoranthene	mg/kg dry wt	< 0.014	-	-	-	-
Fluorene	mg/kg dry wt	< 0.014	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.014	-	-	-	-
Naphthalene	mg/kg dry wt	< 0.07	-	-	-	-

Sample Type: Soil						
Sample Name:		MDL24017 06-Nov-2024	MDL24021 06-Nov-2024	MDL24023 06-Nov-2024	MDL24025 06-Nov-2024	MDL24026 06-Nov-2024
Lab Number:		3711038.6	3711038.7	3711038.8	3711038.9	3711038.10
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Perylene	mg/kg dry wt	< 0.014	-	-	-	-
Phenanthrene	mg/kg dry wt	< 0.014	-	-	-	-
Pyrene	mg/kg dry wt	< 0.014	-	-	-	-

Sample Name:		MDL24028 06-Nov-2024	MDL24030 07-Nov-2024	MDL24032 07-Nov-2024	MDL24034 07-Nov-2024	MDL24036 07-Nov-2024
Lab Number:		3711038.11	3711038.12	3711038.13	3711038.14	3711038.15
Individual Tests						
Dry Matter	g/100g as rcvd	78	-	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	4	2	3	< 2
Total Recoverable Cadmium	mg/kg dry wt	0.14	0.12	0.19	0.15	< 0.10
Total Recoverable Chromium	mg/kg dry wt	9	7	5	5	3
Total Recoverable Copper	mg/kg dry wt	11	4	4	3	< 2
Total Recoverable Lead	mg/kg dry wt	3.3	8.5	7.0	10.8	3.5
Total Recoverable Nickel	mg/kg dry wt	< 2	2	< 2	< 2	< 2
Total Recoverable Zinc	mg/kg dry wt	38	20	17	14	4
Multiresidue Pesticides in Soil samples by GCMS						
Acetochlor	mg/kg dry wt	< 0.009	-	-	-	-
Alachlor	mg/kg dry wt	< 0.006	-	-	-	-
Aldrin	mg/kg dry wt	< 0.013	-	-	-	-
Atrazine	mg/kg dry wt	< 0.009	-	-	-	-
Atrazine-desethyl	mg/kg dry wt	< 0.009	-	-	-	-
Atrazine-desisopropyl	mg/kg dry wt	< 0.018	-	-	-	-
Azaconazole	mg/kg dry wt	< 0.005	-	-	-	-
Azinphos-methyl	mg/kg dry wt	< 0.018	-	-	-	-
Benalaxyl	mg/kg dry wt	< 0.005	-	-	-	-
Bendiocarb	mg/kg dry wt	< 0.009	-	-	-	-
Benodanil	mg/kg dry wt	< 0.018	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.013	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.013	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.013	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	-	-	-	-
Bifenthrin	mg/kg dry wt	< 0.005	-	-	-	-
Bitertanol	mg/kg dry wt	< 0.018	-	-	-	-
Bromacil	mg/kg dry wt	< 0.009	-	-	-	-
Bromophos-ethyl	mg/kg dry wt	< 0.009	-	-	-	-
Bromopropylate	mg/kg dry wt	< 0.009	-	-	-	-
Bupirimate	mg/kg dry wt	< 0.009	-	-	-	-
Buprofezin	mg/kg dry wt	< 0.009	-	-	-	-
Butachlor	mg/kg dry wt	< 0.009	-	-	-	-
Captafol	mg/kg dry wt	< 0.05	-	-	-	-
Captan	mg/kg dry wt	< 0.018	-	-	-	-
Carbaryl	mg/kg dry wt	< 0.009	-	-	-	-
Carbofenothion	mg/kg dry wt	< 0.009	-	-	-	-
Carbofuran	mg/kg dry wt	< 0.009	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	-	-	-	-
Chlorfenvinphos	mg/kg dry wt	< 0.013	-	-	-	-
Chlorfluazuron	mg/kg dry wt	< 0.009	-	-	-	-
Chlorothalonil	mg/kg dry wt	< 0.009	-	-	-	-
Chlorpropham	mg/kg dry wt	< 0.018	-	-	-	-
Chlorpyrifos	mg/kg dry wt	< 0.009	-	-	-	-
Chlorpyrifos-methyl	mg/kg dry wt	< 0.009	-	-	-	-
Chlortoluron	mg/kg dry wt	< 0.018	-	-	-	-
Chlozolinate	mg/kg dry wt	< 0.009	-	-	-	-

Sample Type: Soil						
Sample Name:		MDL24028 06-Nov-2024	MDL24030 07-Nov-2024	MDL24032 07-Nov-2024	MDL24034 07-Nov-2024	MDL24036 07-Nov-2024
Lab Number:		3711038.11	3711038.12	3711038.13	3711038.14	3711038.15
Multiresidue Pesticides in Soil samples by GCMS						
Coumaphos	mg/kg dry wt	< 0.018	-	-	-	-
Cyanazine	mg/kg dry wt	< 0.009	-	-	-	-
Cyfluthrin	mg/kg dry wt	< 0.011	-	-	-	-
Cyhalothrin	mg/kg dry wt	< 0.009	-	-	-	-
Cypermethrin	mg/kg dry wt	< 0.03	-	-	-	-
Cyproconazole	mg/kg dry wt	< 0.018	-	-	-	-
Cyprodinil	mg/kg dry wt	< 0.009	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	-	-	-	-
Deltamethrin (including Tralomethrin)	mg/kg dry wt	< 0.009	-	-	-	-
Diazinon	mg/kg dry wt	< 0.005	-	-	-	-
Dichlobenil	mg/kg dry wt	< 0.009	-	-	-	-
Dichlofenthion	mg/kg dry wt	< 0.009	-	-	-	-
Dichlofluanid	mg/kg dry wt	< 0.009	-	-	-	-
Dichloran	mg/kg dry wt	< 0.03	-	-	-	-
Dichlorvos	mg/kg dry wt	< 0.010	-	-	-	-
Dicofol	mg/kg dry wt	< 0.05	-	-	-	-
Dicrotophos	mg/kg dry wt	< 0.009	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.013	-	-	-	-
Difenoconazole	mg/kg dry wt	< 0.013	-	-	-	-
Dimethoate	mg/kg dry wt	< 0.018	-	-	-	-
Dinocap	mg/kg dry wt	< 0.10	-	-	-	-
Diphenylamine	mg/kg dry wt	< 0.018	-	-	-	-
Diuron	mg/kg dry wt	< 0.009	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.013	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.013	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	-	-	-	-
Endrin	mg/kg dry wt	< 0.013	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.013	-	-	-	-
EPN	mg/kg dry wt	< 0.009	-	-	-	-
Ethion	mg/kg dry wt	< 0.009	-	-	-	-
Etrimfos	mg/kg dry wt	< 0.009	-	-	-	-
Famphur	mg/kg dry wt	< 0.009	-	-	-	-
Fenarimol	mg/kg dry wt	< 0.009	-	-	-	-
Fenitrothion	mg/kg dry wt	< 0.009	-	-	-	-
Fenpropathrin	mg/kg dry wt	< 0.009	-	-	-	-
Fenpropimorph	mg/kg dry wt	< 0.009	-	-	-	-
Fensulfothion	mg/kg dry wt	< 0.009	-	-	-	-
Fenvalerate (including Esfenvalerate)	mg/kg dry wt	< 0.013	-	-	-	-
Fluazifop-butyl	mg/kg dry wt	< 0.009	-	-	-	-
Fluometuron	mg/kg dry wt	< 0.009	-	-	-	-
Flusilazole	mg/kg dry wt	< 0.009	-	-	-	-
Fluvalinate	mg/kg dry wt	< 0.007	-	-	-	-
Folpet	mg/kg dry wt	< 0.018	-	-	-	-
Furalaxyl	mg/kg dry wt	< 0.005	-	-	-	-
Haloxyfop-methyl	mg/kg dry wt	< 0.009	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.013	-	-	-	-

Sample Type: Soil						
Sample Name:		MDL24028 06-Nov-2024	MDL24030 07-Nov-2024	MDL24032 07-Nov-2024	MDL24034 07-Nov-2024	MDL24036 07-Nov-2024
Lab Number:		3711038.11	3711038.12	3711038.13	3711038.14	3711038.15
Multiresidue Pesticides in Soil samples by GCMS						
Heptachlor epoxide	mg/kg dry wt	< 0.013	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	-	-	-	-
Hexaconazole	mg/kg dry wt	< 0.009	-	-	-	-
Hexazinone	mg/kg dry wt	< 0.005	-	-	-	-
Hexythiazox	mg/kg dry wt	< 0.05	-	-	-	-
Imazalil	mg/kg dry wt	< 0.05	-	-	-	-
Indoxacarb	mg/kg dry wt	< 0.009	-	-	-	-
Iodofenphos	mg/kg dry wt	< 0.009	-	-	-	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.05	-	-	-	-
Isazophos	mg/kg dry wt	< 0.009	-	-	-	-
Isofenphos	mg/kg dry wt	< 0.005	-	-	-	-
Kresoxim-methyl	mg/kg dry wt	< 0.005	-	-	-	-
Leptophos	mg/kg dry wt	< 0.009	-	-	-	-
Linuron	mg/kg dry wt	< 0.009	-	-	-	-
Malathion	mg/kg dry wt	< 0.009	-	-	-	-
Metalaxyl	mg/kg dry wt	< 0.009	-	-	-	-
Methacrifos	mg/kg dry wt	< 0.009	-	-	-	-
Methamidophos	mg/kg dry wt	< 0.05	-	-	-	-
Methidathion	mg/kg dry wt	< 0.009	-	-	-	-
Methiocarb	mg/kg dry wt	< 0.009	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.013	-	-	-	-
Metolachlor	mg/kg dry wt	< 0.006	-	-	-	-
Metribuzin	mg/kg dry wt	< 0.009	-	-	-	-
Mevinphos	mg/kg dry wt	< 0.018	-	-	-	-
Molinate	mg/kg dry wt	< 0.018	-	-	-	-
Myclobutanil	mg/kg dry wt	< 0.009	-	-	-	-
Naled	mg/kg dry wt	< 0.05	-	-	-	-
Nitrofen	mg/kg dry wt	< 0.018	-	-	-	-
Nitrothal-isopropyl	mg/kg dry wt	< 0.009	-	-	-	-
Norflurazon	mg/kg dry wt	< 0.018	-	-	-	-
Omethoate	mg/kg dry wt	< 0.05	-	-	-	-
Oxadiazon	mg/kg dry wt	< 0.009	-	-	-	-
Oxychlordane	mg/kg dry wt	< 0.005	-	-	-	-
Oxyfluorfen	mg/kg dry wt	< 0.005	-	-	-	-
Paclobutrazol	mg/kg dry wt	< 0.009	-	-	-	-
Parathion-ethyl	mg/kg dry wt	< 0.009	-	-	-	-
Parathion-methyl	mg/kg dry wt	< 0.009	-	-	-	-
Penconazole	mg/kg dry wt	< 0.009	-	-	-	-
Pendimethalin	mg/kg dry wt	< 0.009	-	-	-	-
Permethrin	mg/kg dry wt	< 0.003	-	-	-	-
Phosmet	mg/kg dry wt	< 0.009	-	-	-	-
Phosphamidon	mg/kg dry wt	< 0.009	-	-	-	-
Pirimicarb	mg/kg dry wt	< 0.009	-	-	-	-
Pirimiphos-methyl	mg/kg dry wt	< 0.009	-	-	-	-
Prochloraz	mg/kg dry wt	< 0.05	-	-	-	-
Procymidone	mg/kg dry wt	< 0.009	-	-	-	-
Prometryn	mg/kg dry wt	< 0.005	-	-	-	-
Propachlor	mg/kg dry wt	< 0.009	-	-	-	-
Propanil	mg/kg dry wt	< 0.03	-	-	-	-
Propazine	mg/kg dry wt	< 0.005	-	-	-	-
Propetamphos	mg/kg dry wt	< 0.009	-	-	-	-
Propham	mg/kg dry wt	< 0.009	-	-	-	-
Propiconazole	mg/kg dry wt	< 0.007	-	-	-	-
Prothiofos	mg/kg dry wt	< 0.009	-	-	-	-

Sample Type: Soil						
Sample Name:		MDL24028 06-Nov-2024	MDL24030 07-Nov-2024	MDL24032 07-Nov-2024	MDL24034 07-Nov-2024	MDL24036 07-Nov-2024
Lab Number:		3711038.11	3711038.12	3711038.13	3711038.14	3711038.15
Multiresidue Pesticides in Soil samples by GCMS						
Pyrazophos	mg/kg dry wt	< 0.009	-	-	-	-
Pyrifenox	mg/kg dry wt	< 0.013	-	-	-	-
Pyrimethanil	mg/kg dry wt	< 0.009	-	-	-	-
Pyriproxyfen	mg/kg dry wt	< 0.009	-	-	-	-
Quintozene	mg/kg dry wt	< 0.018	-	-	-	-
Quizalofop-ethyl	mg/kg dry wt	< 0.009	-	-	-	-
Simazine	mg/kg dry wt	< 0.009	-	-	-	-
Simetryn	mg/kg dry wt	< 0.009	-	-	-	-
Sulfentrazone	mg/kg dry wt	< 0.05	-	-	-	-
Sulfotep	mg/kg dry wt	< 0.009	-	-	-	-
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	< 0.018	-	-	-	-
Tebuconazole	mg/kg dry wt	< 0.009	-	-	-	-
Tebufenpyrad	mg/kg dry wt	< 0.005	-	-	-	-
Terbacil	mg/kg dry wt	< 0.009	-	-	-	-
Terbumeton	mg/kg dry wt	< 0.009	-	-	-	-
Terbuthylazine	mg/kg dry wt	< 0.005	-	-	-	-
Terbuthylazine-desethyl	mg/kg dry wt	< 0.009	-	-	-	-
Terbutryn	mg/kg dry wt	< 0.009	-	-	-	-
Tetrachlorvinphos	mg/kg dry wt	< 0.009	-	-	-	-
Thiabendazole	mg/kg dry wt	< 0.05	-	-	-	-
Thiobencarb	mg/kg dry wt	< 0.009	-	-	-	-
Tolylfluanid	mg/kg dry wt	< 0.005	-	-	-	-
Triadimefon	mg/kg dry wt	< 0.009	-	-	-	-
Triazophos	mg/kg dry wt	< 0.009	-	-	-	-
Trifluralin	mg/kg dry wt	< 0.009	-	-	-	-
Vinclozolin	mg/kg dry wt	< 0.009	-	-	-	-

Sample Name:		MDL24038 07-Nov-2024	MDL24040 07-Nov-2024	MDL24041 07-Nov-2024	MDL24043 07-Nov-2024	MDL24045 07-Nov-2024
Lab Number:		3711038.16	3711038.17	3711038.18	3711038.19	3711038.20
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	2	7	< 2	< 2	< 2
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	0.11	< 0.10	0.14
Total Recoverable Chromium	mg/kg dry wt	3	7	2	3	5
Total Recoverable Copper	mg/kg dry wt	6	< 2	3	< 2	3
Total Recoverable Lead	mg/kg dry wt	12.1	6.8	10.2	3.9	7.9
Total Recoverable Nickel	mg/kg dry wt	3	< 2	< 2	< 2	14
Total Recoverable Zinc	mg/kg dry wt	18	6	15	6	8

Sample Name:		MDL24047 07-Nov-2024	MDL24050 07-Nov-2024	MDL24049 07-Nov-2024	MDL24008 07-Nov-2024	MDL24018 07-Nov-2024
Lab Number:		3711038.21	3711038.22	3711038.23	3711038.27	3711038.29
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	7	-
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	0.14	-
Total Recoverable Zinc	mg/kg dry wt	-	-	-	98	1,000
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	< 2	4	4	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.14	0.13	-	-
Total Recoverable Chromium	mg/kg dry wt	3	6	6	-	-
Total Recoverable Copper	mg/kg dry wt	< 2	5	4	-	-
Total Recoverable Lead	mg/kg dry wt	7.3	10.9	10.3	-	-
Total Recoverable Nickel	mg/kg dry wt	< 2	3	3	-	-
Total Recoverable Zinc	mg/kg dry wt	10	25	22	-	-

Sample Type: Soil						
Sample Name:		MDL24024 07-Nov-2024	MDL24042 07-Nov-2024	MDL24052 07-Nov-2024	MDL24053 07-Nov-2024	MDL24054 07-Nov-2024
Lab Number:		3711038.31	3711038.39	3711038.44	3711038.45	3711038.46
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	77	74	82
Total Recoverable Arsenic	mg/kg dry wt	21	-	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	2	3	3	3
Total Recoverable Cadmium	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	-	5	13	11	13
Total Recoverable Copper	mg/kg dry wt	-	< 2	16	18	19
Total Recoverable Lead	mg/kg dry wt	-	6.1	7.7	8.3	7.0
Total Recoverable Nickel	mg/kg dry wt	-	< 2	7	7	9
Total Recoverable Zinc	mg/kg dry wt	-	6	22	24	31
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	< 0.4	< 0.4	< 0.3
1-Methylnaphthalene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
2-Methylnaphthalene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Acenaphthylene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Acenaphthene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Anthracene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[a]anthracene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	< 0.031	< 0.033	< 0.030
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	< 0.031	< 0.033	< 0.029
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[e]pyrene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Benzo[k]fluoranthene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Chrysene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Fluoranthene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Fluorene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Naphthalene	mg/kg dry wt	-	-	< 0.07	< 0.07	< 0.06
Perylene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Phenanthrene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012
Pyrene	mg/kg dry wt	-	-	< 0.013	< 0.014	< 0.012

Sample Name:		MDL24055 07-Nov-2024	MDL24056 07-Nov-2024	Composite of MDL24030 & MDL24032	Composite of MDL24034 & MDL24036	Composite of MDL24038 & MDL24040
Lab Number:		3711038.47	3711038.48	3711038.49	3711038.50	3711038.51
Individual Tests						
Dry Matter	g/100g as rcvd	79	88	73	80	78
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	< 2	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	3	-	-	-
Total Recoverable Copper	mg/kg dry wt	22	3	-	-	-
Total Recoverable Lead	mg/kg dry wt	6.1	5.4	-	-	-
Total Recoverable Nickel	mg/kg dry wt	13	< 2	-	-	-
Total Recoverable Zinc	mg/kg dry wt	42	< 4	-	-	-
Multiresidue Pesticides in Soil samples by GCMS						
Acetochlor	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Alachlor	mg/kg dry wt	-	-	< 0.006	< 0.006	< 0.006
Aldrin	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013

Sample Type: Soil						
Sample Name:		MDL24055 07-Nov-2024	MDL24056 07-Nov-2024	Composite of MDL24030 & MDL24032	Composite of MDL24034 & MDL24036	Composite of MDL24038 & MDL24040
Lab Number:		3711038.47	3711038.48	3711038.49	3711038.50	3711038.51
Multiresidue Pesticides in Soil samples by GCMS						
Atrazine	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Atrazine-desethyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Atrazine-desisopropyl	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Azaconazole	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Azinphos-methyl	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Benalaxyl	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Bendiocarb	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Benodanil	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
alpha-BHC	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
beta-BHC	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
delta-BHC	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Bifenthrin	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Bitertanol	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Bromacil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Bromophos-ethyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Bromopropylate	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Bupirimate	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Buprofezin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Butachlor	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Captafol	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Captan	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Carbaryl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Carbofenothion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Carbofuran	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
cis-Chlordane	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
trans-Chlordane	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Chlorfenvinphos	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Chlorfluazuron	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Chlorothalonil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Chlorpropham	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Chlorpyrifos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Chlorpyrifos-methyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Chlortoluron	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Chlozolinate	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Coumaphos	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Cyanazine	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Cyfluthrin	mg/kg dry wt	-	-	< 0.012	< 0.011	< 0.011
Cyhalothrin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Cypermethrin	mg/kg dry wt	-	-	< 0.03	< 0.03	< 0.03
Cyproconazole	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Cyprodinil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
2,4'-DDD	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
4,4'-DDD	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
2,4'-DDE	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
4,4'-DDE	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
2,4'-DDT	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
4,4'-DDT	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Total DDT Isomers	mg/kg dry wt	-	-	< 0.09	< 0.08	< 0.08
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Diazinon	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Dichlobenil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Dichlofenthion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009

Sample Type: Soil						
Sample Name:		MDL24055 07-Nov-2024	MDL24056 07-Nov-2024	Composite of MDL24030 & MDL24032	Composite of MDL24034 & MDL24036	Composite of MDL24038 & MDL24040
Lab Number:		3711038.47	3711038.48	3711038.49	3711038.50	3711038.51
Multiresidue Pesticides in Soil samples by GCMS						
Dichlofluanid	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Dichloran	mg/kg dry wt	-	-	< 0.03	< 0.03	< 0.03
Dichlorvos	mg/kg dry wt	-	-	< 0.010	< 0.010	< 0.010
Dicofol	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Dicrotophos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Dieldrin	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Difenoconazole	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Dimethoate	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Dinocap	mg/kg dry wt	-	-	< 0.11	< 0.10	< 0.10
Diphenylamine	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Diuron	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Endosulfan I	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Endosulfan II	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Endrin	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Endrin aldehyde	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Endrin ketone	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
EPN	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Ethion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Etrimfos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Famphur	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fenarimol	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fenitrothion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fenpropathrin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fenpropimorph	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fensulfothion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fenvalerate (including Esfenvalerate)	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Fluazifop-butyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fluometuron	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Flusilazole	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Fluvalinate	mg/kg dry wt	-	-	< 0.007	< 0.006	< 0.007
Folpet	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Furalaxyl	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Haloxyfop-methyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Heptachlor	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Hexaconazole	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Hexazinone	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Hexythiazox	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Imazalil	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Indoxacarb	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Iodofenphos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Isazophos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Isofenphos	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Kresoxim-methyl	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Leptophos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Linuron	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Malathion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Metalaxyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Methacrifos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Methamidophos	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05

Sample Type: Soil						
Sample Name:		MDL24055 07-Nov-2024	MDL24056 07-Nov-2024	Composite of MDL24030 & MDL24032	Composite of MDL24034 & MDL24036	Composite of MDL24038 & MDL24040
Lab Number:		3711038.47	3711038.48	3711038.49	3711038.50	3711038.51
Multiresidue Pesticides in Soil samples by GCMS						
Methidathion	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Methiocarb	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Methoxychlor	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Metolachlor	mg/kg dry wt	-	-	< 0.006	< 0.006	< 0.006
Metribuzin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Mevinphos	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Molinate	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Myclobutanil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Naled	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Nitrofen	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Nitrothal-isopropyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Norflurazon	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Omethoate	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Oxadiazon	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Oxychlordane	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Oxyfluorfen	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Paclobutrazol	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Parathion-ethyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Parathion-methyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Penconazole	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pendimethalin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Permethrin	mg/kg dry wt	-	-	< 0.003	< 0.003	< 0.003
Phosmet	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Phosphamidon	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pirimicarb	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pirimiphos-methyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Prochloraz	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Procymidone	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Prometryn	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Propachlor	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Propanil	mg/kg dry wt	-	-	< 0.03	< 0.03	< 0.03
Propazine	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Propetamphos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Propham	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Propiconazole	mg/kg dry wt	-	-	< 0.007	< 0.006	< 0.007
Prothiofos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pyrazophos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pyrifenox	mg/kg dry wt	-	-	< 0.014	< 0.012	< 0.013
Pyrimethanil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Pyriproxyfen	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Quintozene	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Quizalofop-ethyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Simazine	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Simetryn	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Sulfentrazone	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Sulfotep	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	-	-	< 0.019	< 0.017	< 0.018
Tebuconazole	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Tebufenpyrad	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Terbacil	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Terbumeton	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Terbuthylazine	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Terbuthylazine-desethyl	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009

Sample Type: Soil						
Sample Name:		MDL24055 07-Nov-2024	MDL24056 07-Nov-2024	Composite of MDL24030 & MDL24032	Composite of MDL24034 & MDL24036	Composite of MDL24038 & MDL24040
Lab Number:		3711038.47	3711038.48	3711038.49	3711038.50	3711038.51
Multiresidue Pesticides in Soil samples by GCMS						
Terbutryn	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Tetrachlorvinphos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Thiabendazole	mg/kg dry wt	-	-	< 0.05	< 0.05	< 0.05
Thiobencarb	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Tolylfluanid	mg/kg dry wt	-	-	< 0.005	< 0.005	< 0.005
Triadimefon	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Triazophos	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Trifluralin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Vinclozolin	mg/kg dry wt	-	-	< 0.010	< 0.009	< 0.009
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Acenaphthene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Anthracene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.030	< 0.027	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.030	< 0.027	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Chrysene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Fluoranthene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Fluorene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Naphthalene	mg/kg dry wt	< 0.07	< 0.06	-	-	-
Perylene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Phenanthrene	mg/kg dry wt	< 0.013	< 0.011	-	-	-
Pyrene	mg/kg dry wt	< 0.013	< 0.011	-	-	-

Sample Name:		Composite of MDL24043 & MDL24045	Composite of MDL24047 & MDL24049
Lab Number:		3711038.52	3711038.53
Individual Tests			
Dry Matter	g/100g as rcvd	78	75
Multiresidue Pesticides in Soil samples by GCMS			
Acetochlor	mg/kg dry wt	< 0.009	< 0.009
Alachlor	mg/kg dry wt	< 0.006	< 0.006
Aldrin	mg/kg dry wt	< 0.013	< 0.013
Atrazine	mg/kg dry wt	< 0.009	< 0.009
Atrazine-desethyl	mg/kg dry wt	< 0.009	< 0.009
Atrazine-desisopropyl	mg/kg dry wt	< 0.018	< 0.018
Azaconazole	mg/kg dry wt	< 0.005	< 0.005
Azinphos-methyl	mg/kg dry wt	< 0.018	< 0.018
Benalaxyl	mg/kg dry wt	< 0.005	< 0.005
Bendiocarb	mg/kg dry wt	< 0.009	< 0.009
Benodanil	mg/kg dry wt	< 0.018	< 0.018
alpha-BHC	mg/kg dry wt	< 0.013	< 0.013
beta-BHC	mg/kg dry wt	< 0.013	< 0.013

Sample Type: Soil			
Sample Name:		Composite of MDL24043 & MDL24045	Composite of MDL24047 & MDL24049
Lab Number:		3711038.52	3711038.53
Multiresidue Pesticides in Soil samples by GCMS			
delta-BHC	mg/kg dry wt	< 0.013	< 0.013
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	< 0.013
Bifenthrin	mg/kg dry wt	< 0.005	< 0.005
Bitertanol	mg/kg dry wt	< 0.018	< 0.018
Bromacil	mg/kg dry wt	< 0.009	< 0.009
Bromophos-ethyl	mg/kg dry wt	< 0.009	< 0.009
Bromopropylate	mg/kg dry wt	< 0.009	< 0.009
Bupirimate	mg/kg dry wt	< 0.009	< 0.009
Buprofezin	mg/kg dry wt	< 0.009	< 0.009
Butachlor	mg/kg dry wt	< 0.009	< 0.009
Captafol	mg/kg dry wt	< 0.05	< 0.05
Captan	mg/kg dry wt	< 0.018	< 0.018
Carbaryl	mg/kg dry wt	< 0.009	< 0.009
Carbofenothion	mg/kg dry wt	< 0.009	< 0.009
Carbofuran	mg/kg dry wt	< 0.009	< 0.009
cis-Chlordane	mg/kg dry wt	< 0.013	< 0.013
trans-Chlordane	mg/kg dry wt	< 0.013	< 0.013
Chlorfenvinphos	mg/kg dry wt	< 0.013	< 0.013
Chlorfluazuron	mg/kg dry wt	< 0.009	< 0.009
Chlorothalonil	mg/kg dry wt	< 0.009	< 0.009
Chlorpropham	mg/kg dry wt	< 0.018	< 0.018
Chlorpyrifos	mg/kg dry wt	< 0.009	< 0.009
Chlorpyrifos-methyl	mg/kg dry wt	< 0.009	< 0.009
Chlortoluron	mg/kg dry wt	< 0.018	< 0.018
Chlozolinate	mg/kg dry wt	< 0.009	< 0.009
Coumaphos	mg/kg dry wt	< 0.018	< 0.018
Cyanazine	mg/kg dry wt	< 0.009	< 0.009
Cyfluthrin	mg/kg dry wt	< 0.011	< 0.012
Cyhalothrin	mg/kg dry wt	< 0.009	< 0.009
Cypermethrin	mg/kg dry wt	< 0.03	< 0.03
Cyproconazole	mg/kg dry wt	< 0.018	< 0.018
Cyprodinil	mg/kg dry wt	< 0.009	< 0.009
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.013
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.013
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.013
4,4'-DDE	mg/kg dry wt	< 0.013	< 0.013
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.013
4,4'-DDT	mg/kg dry wt	< 0.013	< 0.013
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08
Deltamethrin (including Tralomethrin)	mg/kg dry wt	< 0.009	< 0.009
Diazinon	mg/kg dry wt	< 0.005	< 0.005
Dichlobenil	mg/kg dry wt	< 0.009	< 0.009
Dichlofenthion	mg/kg dry wt	< 0.009	< 0.009
Dichlofluanid	mg/kg dry wt	< 0.009	< 0.009
Dichloran	mg/kg dry wt	< 0.03	< 0.03
Dichlorvos	mg/kg dry wt	< 0.010	< 0.010
Dicofol	mg/kg dry wt	< 0.05	< 0.05
Dicrotophos	mg/kg dry wt	< 0.009	< 0.009
Dieldrin	mg/kg dry wt	< 0.013	< 0.013
Difenoconazole	mg/kg dry wt	< 0.013	< 0.013
Dimethoate	mg/kg dry wt	< 0.018	< 0.018
Dinocap	mg/kg dry wt	< 0.10	< 0.11
Diphenylamine	mg/kg dry wt	< 0.018	< 0.018
Diuron	mg/kg dry wt	< 0.009	< 0.009
Endosulfan I	mg/kg dry wt	< 0.013	< 0.013

Sample Type: Soil			
	Sample Name:	Composite of MDL24043 & MDL24045	Composite of MDL24047 & MDL24049
	Lab Number:	3711038.52	3711038.53
Multiresidue Pesticides in Soil samples by GCMS			
Endosulfan II	mg/kg dry wt	< 0.013	< 0.013
Endosulfan sulphate	mg/kg dry wt	< 0.013	< 0.013
Endrin	mg/kg dry wt	< 0.013	< 0.013
Endrin aldehyde	mg/kg dry wt	< 0.013	< 0.013
Endrin ketone	mg/kg dry wt	< 0.013	< 0.013
EPN	mg/kg dry wt	< 0.009	< 0.009
Ethion	mg/kg dry wt	< 0.009	< 0.009
Etrimfos	mg/kg dry wt	< 0.009	< 0.009
Famphur	mg/kg dry wt	< 0.009	< 0.009
Fenarimol	mg/kg dry wt	< 0.009	< 0.009
Fenitrothion	mg/kg dry wt	< 0.009	< 0.009
Fenpropathrin	mg/kg dry wt	< 0.009	< 0.009
Fenpropimorph	mg/kg dry wt	< 0.009	< 0.009
Fensulfothion	mg/kg dry wt	< 0.009	< 0.009
Fenvalerate (including Esfenvalerate)	mg/kg dry wt	< 0.013	< 0.013
Fluazifop-butyl	mg/kg dry wt	< 0.009	< 0.009
Fluometuron	mg/kg dry wt	< 0.009	< 0.009
Flusilazole	mg/kg dry wt	< 0.009	< 0.009
Fluvalinate	mg/kg dry wt	< 0.007	< 0.007
Folpet	mg/kg dry wt	< 0.018	< 0.018
Furalaxyl	mg/kg dry wt	< 0.005	< 0.005
Haloxyfop-methyl	mg/kg dry wt	< 0.009	< 0.009
Heptachlor	mg/kg dry wt	< 0.013	< 0.013
Heptachlor epoxide	mg/kg dry wt	< 0.013	< 0.013
Hexachlorobenzene	mg/kg dry wt	< 0.013	< 0.013
Hexaconazole	mg/kg dry wt	< 0.009	< 0.009
Hexazinone	mg/kg dry wt	< 0.005	< 0.005
Hexythiazox	mg/kg dry wt	< 0.05	< 0.05
Imazalil	mg/kg dry wt	< 0.05	< 0.05
Indoxacarb	mg/kg dry wt	< 0.009	< 0.009
Iodofenphos	mg/kg dry wt	< 0.009	< 0.009
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.05	< 0.05
Isazophos	mg/kg dry wt	< 0.009	< 0.009
Isofenphos	mg/kg dry wt	< 0.005	< 0.005
Kresoxim-methyl	mg/kg dry wt	< 0.005	< 0.005
Leptophos	mg/kg dry wt	< 0.009	< 0.009
Linuron	mg/kg dry wt	< 0.009	< 0.009
Malathion	mg/kg dry wt	< 0.009	< 0.009
Metalaxyl	mg/kg dry wt	< 0.009	< 0.009
Methacrifos	mg/kg dry wt	< 0.009	< 0.009
Methamidophos	mg/kg dry wt	< 0.05	< 0.05
Methidathion	mg/kg dry wt	< 0.009	< 0.009
Methiocarb	mg/kg dry wt	< 0.009	< 0.009
Methoxychlor	mg/kg dry wt	< 0.013	< 0.013
Metolachlor	mg/kg dry wt	< 0.006	< 0.006
Metribuzin	mg/kg dry wt	< 0.009	< 0.009
Mevinphos	mg/kg dry wt	< 0.018	< 0.018
Molinate	mg/kg dry wt	< 0.018	< 0.018
Myclobutanil	mg/kg dry wt	< 0.009	< 0.009
Naled	mg/kg dry wt	< 0.05	< 0.05
Nitrofen	mg/kg dry wt	< 0.018	< 0.018
Nitrothal-isopropyl	mg/kg dry wt	< 0.009	< 0.009
Norflurazon	mg/kg dry wt	< 0.018	< 0.018
Omethoate	mg/kg dry wt	< 0.05	< 0.05

Sample Type: Soil			
	Sample Name:	Composite of MDL24043 & MDL24045	Composite of MDL24047 & MDL24049
	Lab Number:	3711038.52	3711038.53
Multiresidue Pesticides in Soil samples by GCMS			
Oxadiazon	mg/kg dry wt	< 0.009	< 0.009
Oxychlordane	mg/kg dry wt	< 0.005	< 0.005
Oxyfluorfen	mg/kg dry wt	< 0.005	< 0.005
Paclobutrazol	mg/kg dry wt	< 0.009	< 0.009
Parathion-ethyl	mg/kg dry wt	< 0.009	< 0.009
Parathion-methyl	mg/kg dry wt	< 0.009	< 0.009
Penconazole	mg/kg dry wt	< 0.009	< 0.009
Pendimethalin	mg/kg dry wt	< 0.009	< 0.009
Permethrin	mg/kg dry wt	< 0.003	< 0.003
Phosmet	mg/kg dry wt	< 0.009	< 0.009
Phosphamidon	mg/kg dry wt	< 0.009	< 0.009
Pirimicarb	mg/kg dry wt	< 0.009	< 0.009
Pirimiphos-methyl	mg/kg dry wt	< 0.009	< 0.009
Prochloraz	mg/kg dry wt	< 0.05	< 0.05
Procymidone	mg/kg dry wt	< 0.009	< 0.009
Prometryn	mg/kg dry wt	< 0.005	< 0.005
Propachlor	mg/kg dry wt	< 0.009	< 0.009
Propanil	mg/kg dry wt	< 0.03	< 0.03
Propazine	mg/kg dry wt	< 0.005	< 0.005
Propetamphos	mg/kg dry wt	< 0.009	< 0.009
Propham	mg/kg dry wt	< 0.009	< 0.009
Propiconazole	mg/kg dry wt	< 0.007	< 0.007
Prothiofos	mg/kg dry wt	< 0.009	< 0.009
Pyrazophos	mg/kg dry wt	< 0.009	< 0.009
Pyrifenox	mg/kg dry wt	< 0.013	< 0.013
Pyrimethanil	mg/kg dry wt	< 0.009	< 0.009
Pyriproxyfen	mg/kg dry wt	< 0.009	< 0.009
Quintozene	mg/kg dry wt	< 0.018	< 0.018
Quizalofop-ethyl	mg/kg dry wt	< 0.009	< 0.009
Simazine	mg/kg dry wt	< 0.009	< 0.009
Simetryn	mg/kg dry wt	< 0.009	< 0.009
Sulfentrazone	mg/kg dry wt	< 0.05	< 0.05
Sulfotep	mg/kg dry wt	< 0.009	< 0.009
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	< 0.018	< 0.018
Tebuconazole	mg/kg dry wt	< 0.009	< 0.009
Tebufenpyrad	mg/kg dry wt	< 0.005	< 0.005
Terbacil	mg/kg dry wt	< 0.009	< 0.009
Terbumeton	mg/kg dry wt	< 0.009	< 0.009
Terbuthylazine	mg/kg dry wt	< 0.005	< 0.005
Terbuthylazine-desethyl	mg/kg dry wt	< 0.009	< 0.009
Terbutryn	mg/kg dry wt	< 0.009	< 0.009
Tetrachlorvinphos	mg/kg dry wt	< 0.009	< 0.009
Thiabendazole	mg/kg dry wt	< 0.05	< 0.05
Thiobencarb	mg/kg dry wt	< 0.009	< 0.009
Tolylfluanid	mg/kg dry wt	< 0.005	< 0.005
Triadimefon	mg/kg dry wt	< 0.009	< 0.009
Triazophos	mg/kg dry wt	< 0.009	< 0.009
Trifluralin	mg/kg dry wt	< 0.009	< 0.009
Vinclozolin	mg/kg dry wt	< 0.009	< 0.009

Analyst's Comments

Amended Report: This certificate of analysis replaces report '3711038-SPv2' issued on 18-Nov-2024 at 2:08 pm.
Reason for amendment: Further testing added at clients request.

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).	-	1-23, 27, 29, 31, 39, 44-48
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. 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).	-	27, 29, 31
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2, 4, 6, 44-48
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-23, 39, 44-48
Multiresidue Pesticides in Soil samples by GCMS	Sonication extraction, GC-ECD and GC-MS analysis. In-house based on US EPA 8081 and US EPA 8270.	0.003 - 0.06 mg/kg dry wt	5, 7-11, 49-53
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-2, 4, 6, 44-48
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	1-2, 4-11, 44-53
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	27, 29, 31
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	12-17, 19-21, 23
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	27, 31
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	27
Total Recoverable Zinc	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	4 mg/kg dry wt	27, 29
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-2, 4, 6, 44-48
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-2, 4, 6, 44-48

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

Testing was completed between 07-Nov-2024 and 18-Dec-2024. For completion dates of individual analyses please contact the laboratory.

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

Ara Heron BSc (Tech)
Client Services Manager - Environmental

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Christchurch 8024 New Zealand

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Certificate of Analysis

Client:	Groundwater & Environmental Services	**Lab No:**	3711073	A2Pv1
Contact:	Mr A MacDonald C/- Groundwater & Environmental Services PO Box 190 Cambridge 3450	**Date Received:**	07-Nov-2024	
		Date Reported:	13-Nov-2024	
		Quote No:	82855	
		Order No:		
		Client Reference:	MILLDALE	
		Submitted By:	Mr A MacDonald	

Sample Type: Soil

		Sample Name:	MDL24015 06-Nov-2024	MDL24016 06-Nov-2024
		Lab Number:	3711073.1	3711073.2
Asbestos Presence / Absence			Asbestos NOT detected.	Chrysotile (White Asbestos) detected.
Description of Asbestos Form			-	Loose fibres
Asbestos in ACM as % of Total Sample*	% w/w		< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w		< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w		< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w		< 0.001	< 0.001
As Received Weight	g		483.8	534.7
Dry Weight	g		366.2	346.3
Moisture*	%		24	35
Sample Fraction >10mm	g dry wt		101.9	10.0
Sample Fraction <10mm to >2mm	g dry wt		184.3	177.6
Sample Fraction <2mm	g dry wt		79.2	157.9
<2mm Subsample Weight	g dry wt		50.4	50.8
Weight of Asbestos in ACM (Non-Friable)	g dry wt		< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt		< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt		< 0.00001	0.00005

Glossary of Terms

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

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

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

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

Summary of Methods

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

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-2
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	1-2
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	1-2
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	1-2
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-2
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-2
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-2
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-2

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

Testing was completed on 13-Nov-2024. For completion dates of individual analyses please contact the laboratory.

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

Jessica Griffin BSc, BOHS W504
Team Leader - Asbestos

Appendix G
Statement of Qualification

My full name is **Andrew James MacDonald**. I am an environmental consultant trading as **Groundwater and Environmental Services (GES)**.

I certify that I meet the requirements to operate as a suitably qualified and experienced practitioner (SQEP) under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) in contaminated land and groundwater assessment, management, and remediation.

I hold Bachelor of Science and Master of Science Honours degrees from Auckland University.

I have worked as a consultant in the field of contaminated land and groundwater assessment, management, and remediation since 1991. In that time, I have dealt with contamination issues at numerous industrial, commercial, horticultural, rural and residential sites throughout New Zealand on behalf of commercial, local government and central government clients.

CAPABILITIES

Environmental Site Investigation
Remediation of Contaminated Land
Environmental Effects Assessment
Contaminated Site Consents
Groundwater Investigation
Contaminant Transport Modelling
Groundwater Contamination Remediation

EDUCATION

Bachelor of Science (Geology)	University of Auckland, 1989
Master of Science, Hons (Geology)	University of Auckland, 1991
Environmental Law (COP)	University of Auckland, 1993
Resource Management (Planning) Law (COP)	University of Auckland, 1993

PROFESSIONAL HISTORY

1995 -	Groundwater and Environmental Services, Principal
1991 - 1995	Woodward-Clyde (NZ) Ltd, Environmental Scientist

REPRESENTATIVE EXPERIENCE

- Preliminary and detailed environmental site investigations of a wide range of potentially contaminated sites.
- Remedial action/site management plans for contaminated sites.
- Organisation and supervision of remediation at contaminated sites.
- Validation of remediation at contaminated sites.
- Long term contaminated site monitoring and management plans.

- Resource consents for site remediation and ongoing discharges of contaminants to ground at contaminated sites.
- Provision of expert evidence related to contamination issues.
- Peer review of contaminated site investigations.
- Drilling supervision, soil sampling and groundwater monitoring well installation at a range of sites for investigations of contaminated ground and groundwater.
- Computer modelling of groundwater contaminant transport and associated environmental effects.