Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

6 August 2021

Kia ora

Request for Official Information responded to under the Local Government and Official Information and Meetings Act 1987 (LGOIMA) – reference: 8561368 (OIR: 2021-009)

I refer to your information request we received on 12 July 2021 for the following:

I reference an article in the Otaki Today newspaper June 2021, article 'opportunity for future development to meet community needs'. Pages 4 & 16 refer. I'd like information and relevant documentation about:

1. ***When the KCDC purchased the land in Rangiuru Road, Otaki, for community/social housing, did it do any pre-purchasing due diligence? If so, what were those steps taken and did they include an asbestos survey? What were the findings of the asbestos survey with respect to ground contamination?***

Pre-purchasing due diligence contained several steps, including a Detailed Site Investigation (for soil contamination) and an Asbestos Report.

Findings of the asbestos survey with respect to ground contamination can be found in the attached reports:

254 Rangiuru Road, Otaki – Detailed Site Investigation, dated 28/4/21
254 Rangiuru Road, Otaki – Asbestos Demolition Survey Report, dated 28/4/21

As mentioned in our letter of 30 July 2021, we have investigated the potential release of the Agreement for Sale and Purchase, but the Vendor has requested that this document is withheld under the LGOIMA, Section 7(2)(b)(ii) - withholding of the information is necessary to protect information where the making available of the information would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information.

2. ***What was the purchase price of the land? Did any money get taken off the purchase price to deal with asbestos remediation?***

The purchase price of the land was $1,450,000.00 (incl GST). Details of the negotiation terms are commercially sensitive and are withheld under the LGOIMA Section 7(2)(h) - to enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities.

3. ***Where did the money come from (which funding pool) to purchase the land?***

The money came from the Strategic Land Purchase and Strategic Property Upgrade funds.

4. ***What plans are there for asbestos removal and pesticide contamination to what extent will adjoining neighbours be informed?***

An assessment plan and costings for the removal of the asbestos and demolition of the buildings is currently underway. Part of this plan is to notify any neighbouring property owners.

5. ***What plans are these to consult with and work with neighbouring properties with respect to potential social housing configurations on the site?***

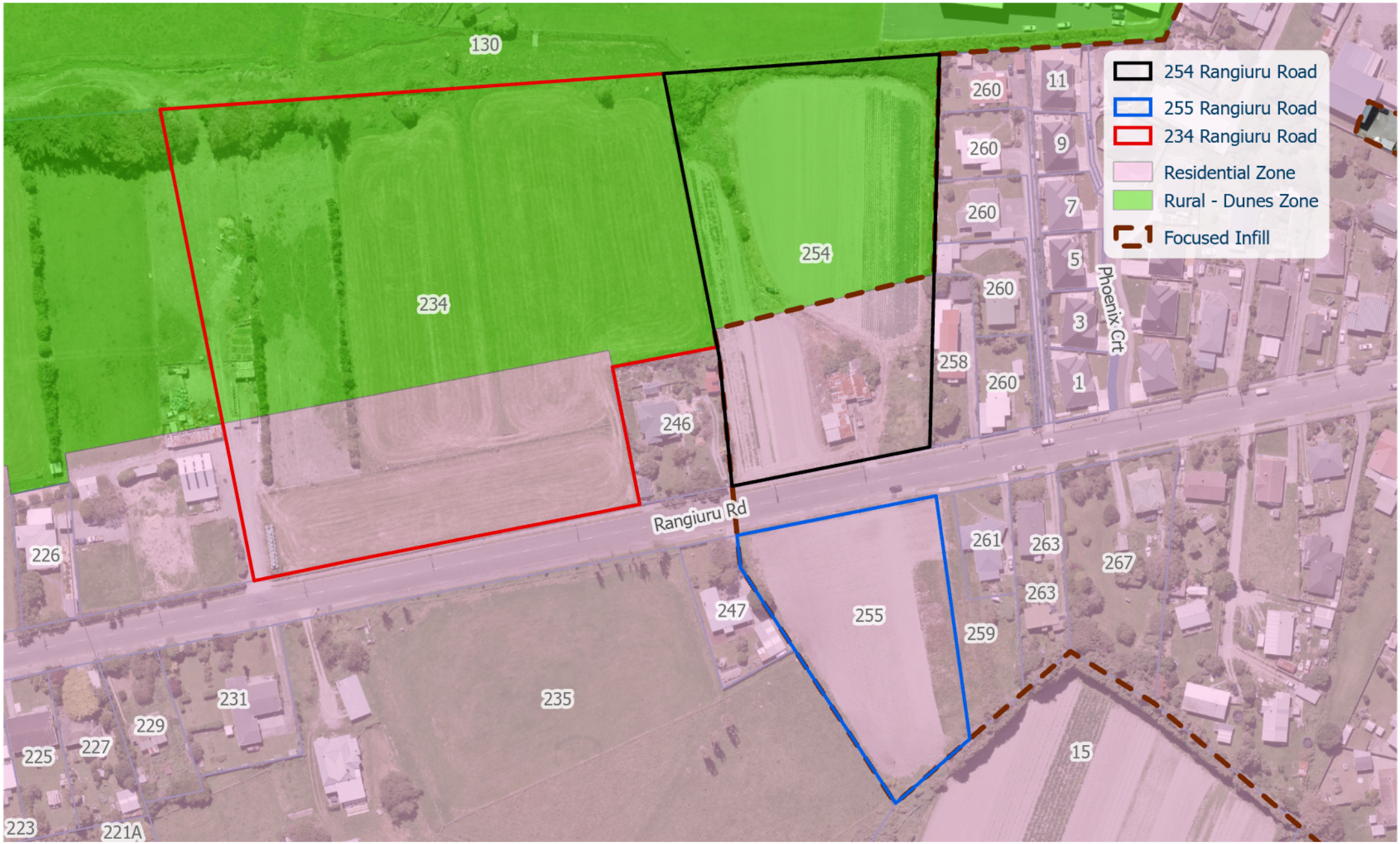
As per our response to you on 30 July I can advise that planning for the site is yet to commence, but when it does, Council's processes will include consultation with neighbouring property owners, as appropriate, regarding the proposed development and any potential impacts.

You have the right to request the Ombudsman to review this decision. Complaints can be sent by email to info@ombudsman.parliament.nz, by fax to (04) 471 2254, or by post to The Ombudsman, PO Box 10152, Wellington 6143.

Ngā mihi

Natasha Tod
Group Manager Strategy, Growth and Recovery
Te Kaiwhakahaere Roopu Rautaki, Te Tipuna me te Whakaoranga

Rangiuru Road, Ōtaki



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Kāpiti Coast DISTRICT COUNCIL

Disclaimers:

1. Plans are concept only and for client purposes.
2. Plans are not to be relied on for costing or resource consent purposes.
3. Areas shown are gross areas and inclusive of access
4. Plans are the property of Land Matters Ltd and should not be reproduced or used for other purposes without the express approval of Land Matters

LANDMATTERS

CLIENT: J.K. YUNG FAMILY HOLDINGS LIMITED & CLAUDETTE NGAN & ANGELA FAWN TUI YUNG

PROJECT: YUNG FAMILY HOLDINGS LTD - 254-255 RANGIURU RD

DRAWING TITLE: 254 RANGIURU ROAD OTAKI CONCEPT PLAN

DATE	PROJECT NO.
30/3/2021	773
SCALE	1:250 @ A1 1:500@ A3
DRAWING NO.	REV
773-CON-256	A

The following tables outline the acquisition considerations officers use when assessing potential property acquisitions:

Table One: *Acquisition Considerations*

Land Required	
A	For a project identified in the LTP within 5 years
B	For longer term Council strategic purposes (eg Dam land) or to comply with Council policy (eg Open Space Strategy)
C	To facilitate strongly supported community based proposals (would require demonstrated community commitment eg funding)
D	For other reason
Opportunity to purchase	
A	Available but opportunity unlikely to ever reoccur (eg Rural subdivisions)
B	Available but opportunity, or equivalent, will reoccur from time to time (eg Ōtaki house site for pump station)
C	Vendor untested
D	Unwilling vendor

Table Two: *Purchase Price and Holding Cost Considerations*

	Purchase price as percentage of available (annual) budget
A	<10%
B	11% - 50%
C	51% - 100%
D	>100%

	Holding Costs
A	Most of the land will be used for the intended purpose within 5 years
B	>50% of holding costs offset by net rental income or sale of any portion surplus to requirement
C	<50% of holding costs offset by net rental income or sale of any portion surplus to requirement
D	Will impose additional costs over and above holding costs

Draft National Policy Statement for Highly Productive Lands Objectives

Objective 1: Recognising the benefits of highly productive land
To recognise and provide for the value and long-term benefits of using highly productive land for primary production.

Objective 2: Maintaining the availability of highly productive land
To maintain the availability of highly productive land for primary production for future generations.

Objective 3: Protecting from inappropriate subdivision, use and development
To protect highly productive land from inappropriate subdivision, use and development, including by:

- avoiding subdivision and land fragmentation that compromises the use of highly productive land for primary production;
- avoiding uncoordinated urban expansion on highly productive land that has not been subject to a strategic planning process; and
- avoiding and mitigating reverse sensitivity effects from sensitive and incompatible activities within and adjacent to highly productive land.

Kapiti Coast District Council

ASBESTOS DEMOLITION SURVEY REPORT

254 RANGIURU ROAD, OTAKI

28 April 2021

Question today
Imagine tomorrow
Create for the future

ASBESTOS DEMOLITION SURVEY REPORT

254 Rangiuru Road, Otaki

Kapiti Coast District Council

WSP
12 Moorhouse Avenue
Christchurch 8011
New Zealand
+64 3 363 5400
wsp.com/nz

REV	DATE	DETAILS
A	28 April 2021	Final

	NAME	DATE	SIGNATURE
Prepared by:	Hannah Juchnowicz	28 April 2021	
Reviewed by:	Matthew Taylor	28 April 2021	
Approved by:	Stephen Thomson	28 April 2021	

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EXECUTIVE SUMMARY

WSP New Zealand Limited (WSP) was engaged by Kapiti Coast District Council to undertake a demolition survey at 254 Rangiuru Road, Otaki ('the site') for asbestos containing materials (ACM).

The survey was undertaken using intrusive methods to visually inspect and (where relevant) sample all accessible areas of the site building/s and the general grounds, identifying suspect asbestos situations as far as reasonably practicable, assessing their current condition and the risk posed by each asbestos situation.

The works were conducted on 08 April 2021 by Hannah Juchnowicz representing WSP.

FINDINGS

ACM was identified or presumed to be present on site, requiring removal prior to the demolition of the site.

RECOMMENDED ACTIONS

- The asbestos containing fibre cement sheet wall cladding of the house is in a deteriorated condition with debris on the surrounding surface soils which may extend further under the house itself. This cladding should be removed as Class B licensed asbestos removal works prior to the demolition of the residence. As part of the removal, the debris in the surrounding soils should be handpicked for removal. A surface soil scrape may be required. Refer to the report titled *254 Rangiuru Road, Otaki – Detailed Site Investigation* (WSP, April 2021) for further information regarding soils. Until this material can be appropriately removed, it is recommended that access to the house and immediate surrounding area is restricted in order to minimise any further disturbance of the asbestos.
- The electrical fuse board on the southern wall of Living Room 1 is strongly presumed to be asbestos containing due to its similarity to other asbestos containing fuse boards. It was not sampled during this survey as it was not confirmed whether the power had been isolated to it. This fuse board should be removed as Class B licensed asbestos removal works prior to demolition of the residence.
- The window putty on the north side windows has been confirmed to contain asbestos. It has been presumed that all other in-situ window putty is also asbestos containing. This material should be removed as Class B licensed asbestos removal works prior to demolition of the residence.
- The fuse board on the south side wall of the shed has been confirmed to contain asbestos. This should be removed as Class B licensed asbestos removal works prior to demolition of the shed.

- A bitumen packer between the house piles and the floor was identified to contain asbestos. The full extent of this material could not be defined as the underfloor void was too narrow to access. It is presumed that every pile under the house will have an asbestos containing packer on it. The packers should be removed as Class B licensed asbestos removal works.
- Asbestos has been identified in the subfloor, but a full inspection of the extent of the identified materials could not be completed safely. As such the subfloor should be further investigated to confirm the identification of all ACMs is complete and note the extents. This should be completed by a competent person once the building has been demolished to floor level.

FURTHER ACTIONS

Further actions can be found in Section 4.2.

1 INTRODUCTION

WSP New Zealand Limited (WSP) was engaged by Kapiti Coast District Council (KCDC) to undertake a demolition survey at 254 Rangiuru Road, Otaki for asbestos containing materials (ACM).

'ACM' are defined in the WorkSafe New Zealand Management and Removal of Asbestos Code of Practice 2016, as referenced by the *Health and Safety at Work (Asbestos) Regulations 2016*, as 'any material or thing that, by its design, contains asbestos'.

This report presents the findings of the inspection conducted on 08 April 2021 by Hannah Juchnowicz.

The report should be read in consideration of the following:

- Nothing contained within this report may be considered to alter or modify regulations and guidelines quoted in Section 2.1.
- No one section, or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendices and attachments.

1.1 OBJECTIVES

The Client's objective is to comply with applicable legislative requirements by ensuring that all asbestos materials have been identified and located in the site buildings so that they can be appropriately removed and/or disposed of as required.

1.2 SCOPE OF WORK

WSP's completed scope of work is summarised below:

- Attendance to site to survey and sample all accessible areas for ACM.
- Inspected the Site and collected representative samples (11) samples collected) using intrusive techniques to:
  - confirm the presence/absence of ACM
  - assess the condition and potential for disturbance of ACM encountered; and
  - determine the extent and quantities of ACM.
- Photographed all investigated materials.
- Submission of collected samples to an International Accreditation of New Zealand (IANZ) accredited laboratory for analysis.
- Preparation of this asbestos demolition survey report.

1.3 SITE DESCRIPTION

The details of the site buildings inspected during the asbestos demolition survey are summarised in Table 1. Buildings not listed below are excluded from the survey and this report.

Table 1 Site Description and Details

DESCRIPTION	DETAILS		
PROPERTY NAME	254 Rangiuru Road, Otaki		
PROPERTY ADDRESS	254 Raniuru Road, Otaki, 5512		
LEGAL DESCRIPTION	Part Te Ahitangutu 16 Block		
BUILDINGS	DESCRIPTION	CONSTRUCTION DATE	ASBESTOS PRESENT
House	The residential dwelling has external walls of asbestos fibre cement sheet cladding over a wooden structure with a corrugated iron roof. Inside there are three bedrooms, a bathroom, a kitchen and two living spaces.	1960s	Yes
Shed	The shed is partially collapsed, has a corrugated iron roof over a wooden structure with hardboard walls. There is a toilet in the south-west corner. The shed is connected to the garage by a corrugated iron roof.	1960s	Yes
Garage	The garage also has a corrugated iron roof and walls with a wooden support structure.	1960s	No

2 SURVEY METHODOLOGY

2.1 SITE INSPECTION

The site inspection involved a thorough and systematic walkthrough of the buildings and structures. Access was made only where safe access by solid floors, decking, walkways, protected catwalks or ladders was available.

The survey was undertaken by visual inspection, destructive sampling techniques and analysis of all areas of site that were nominated for inspection and were accessible at the time of the survey.

This type of survey aims to identify materials from accessible areas where destruction, dismantling or damage was undertaken. WSP has made every attempt to access all areas of the site, however, there remains the potential for some construction materials to:

- be concealed between walls or under floors; or
- require specific machinery (excavator), partial demolition to allow access or additional controls to allow for safe access.

Considering the above, WSP cannot guarantee that all hazardous materials have been identified within the site.

An accidental finds protocol should always be implemented and communicated to all contractors prior to commencement of demolition occurring on-site.

Observations recorded for known and suspected ACM included details of the:

- location
- application
- condition
- risk
- friability
- approximate extents and/or quantity.

The site inspection was undertaken as per WSP's in house survey guide, which references the following:

- WorkSafe New Zealand 2016, *Approved Code of Practice for the Management and Removal of Asbestos*, 'How to Manage and Control Asbestos in the Workplace'
- WorkSafe New Zealand 2016, Good Practice Guidelines for Conducting Asbestos Surveys
- United Kingdom Health & Safety Executive publication, 'HSG 264: Asbestos: The survey guide'.

This is in combination with the Health and Safety at Work (Asbestos) Regulations 2016.

Please note that this report is in relation to the above ground assets only and does not include an assessment of the potential impact of asbestos in soil.

2.2 SAMPLE ANALYSIS

Suspected asbestos samples collected during survey works were analysed by Eurofins Environmental NZ in accordance with their IANZ accreditation using polarised light microscopy in conjunction with dispersion staining techniques. A copy of the laboratory certificate of analysis are provided in Appendix F.

2.3 COLLECTION OF DATA

Following the site inspection and any subsequent sample analysis, all data collected were tabulated to form an asbestos register that includes the material assessment scores risk ratings, location, approximate extents and unique identifier for the representative photos reported in the photographic log.

2.4 AREAS NOT ACCESSED

During the asbestos demolition survey, all internal areas were able to be accessed.

In complying with Workplace Health and Safety requirements, particularly with regards to working at heights, and confined spaces, access to some external areas of the site were restricted.

Rooftops were visually assessed from perimeter areas of the roof using ladder access. The under-floor void of the house was assessed from external access points only as the house sits too low to the ground to access.

The main fuse board in Living Room 1 was not sampled as it was not confirmed if the power had been shut off.

2.5 QUANTITY OF ASBESTOS

Measurement of the quantity of asbestos has been undertaken with a conventional measuring tape. The quantities should be treated as estimates only.

3 RESULTS

Representative locations of investigated materials are shown in Appendix A.

The results of the asbestos survey are provided in an excel database format, which is designed to provide readily available information about the presence of asbestos hazards on-site. A printable version of the asbestos register is provided in Appendix B.

Representative photographs of buildings and investigated materials are provided in Appendix C.

The material assessment algorithm, obtained from the WorkSafe New Zealand (2016) *Good Practice Guidelines for Conducting Asbestos Surveys*, assesses the potential for fibre release from the ACM identified on-site. A copy of the material assessment algorithm is provided in Appendix D.

Laboratory certificates of analysis are provided in Appendix E.

4 RECOMMENDATIONS

To ensure that identified ACM are appropriately removed and managed up until demolition commences, WSP recommends the following:

4.1 RECOMMENDED ACTIONS

- The asbestos containing fibre cement sheet wall cladding of the house is in a deteriorated condition with debris on the surrounding surface soils which may extend further under the house itself. This cladding should be removed as Class B licensed asbestos removal works prior to the demolition of the residence. As part of the removal, the debris in the surrounding soils should be handpicked for removal. A surface soil scrape may be required. Refer to the report titled *254 Rangiuru Road, Otaki – Detailed Site Investigation* (WSP, April 2021) for further information regarding soils. Until this material can be appropriately removed, it is recommended that access to the house and immediate surrounding area is restricted in order to minimise any further disturbance of the asbestos.
- The electrical fuse board on the southern wall of Living Room 1 is strongly presumed to be asbestos containing due to its similarity to other asbestos containing fuse boards. It was not sampled during this survey as it was not confirmed whether the power had been isolated to it. This fuse board should be removed as Class B licensed asbestos removal works prior to demolition of the residence.
- The window putty on the north side windows has been confirmed to contain asbestos. It has been presumed that all other in-situ window putty is also asbestos containing. This material should be removed as Class B licensed asbestos removal works prior to demolition of the residence.
- The fuse board on the south side wall of the shed has been confirmed to contain asbestos. This should be removed as Class B licensed asbestos removal works prior to demolition of the shed.
- A bitumen packer between the house piles and the floor was identified to contain asbestos. The full extent of this material could not be defined as the underfloor void was too narrow to access. It is presumed that every pile under the house will have an asbestos containing packer on it. The packers should be removed as Class B licensed asbestos removal works.
- Asbestos has been identified in the subfloor, but a full inspection of the extent of the identified materials could not be completed safely. As such the subfloor should be investigated to confirm the identification of asbestos is complete and note the extents. This should be completed by a competent person once the building has been demolished to floor level.

4.2 FURTHER ACTIONS

- Although the survey was undertaken using destructive methods, there may remain a potential for ACM to be concealed within the building structure. An accidental discovery protocol should always be in place during demolition works. If any suspect materials are identified during the demolition works, a sample of these materials should be collected and tested in an IANZ accredited laboratory for the presence of asbestos.
- A copy of the up-to-date asbestos register should be readily available on-site during site works.

5 LIMITATIONS

This asbestos demolition survey report ('the Report') has been prepared in accordance with the scope of services set out in the Short form Agreement with the Client dated 1 April 2021. The findings in this Report are based on and are subject to the assumptions specified in this Report and the Offer of Services dated 31 March 2021 or as otherwise agreed, between Kapiti Coast District Council ('the Client') and WSP ('the Agreement')

This Report is provided by WSP for the purpose described in the Agreement ('the Permitted Purpose') and no responsibility is accepted by WSP for the use of the Report for any other purpose, in whole or in part.

QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or as otherwise communicated to the Client.

To the extent that statements, opinions, facts, conclusion and/or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified except where explicitly stated. WSP accepts no responsibility for the Information.

This report is limited to the identification of asbestos containing materials (ACM) and should not be used to determine other hazardous materials that could be on-site.

WSP has made every effort to survey the site to identify ACM, however due to certain construction methods it may be impossible to locate all ACM during an inspection. WSP has provided (in Section 2.4 of this report) their best understanding of the current site conditions and areas that would be required for further inspection prior to demolition.

USE AND RELIANCE

This Report should be read in its entirety and must not be copied, distributed or referred to in part only. WSP will not be responsible for interpretations or conclusions drawn. This Report (or sections of the Report) should not be used as part of a specification for a project or for incorporation into any other document without the prior agreement of WSP.

WSP is not (and will not be) obliged to provide an update of this Report to include any event, circumstance, revised Information or any matter coming to WSP's attention after the date of this Report, unless this has been explicitly agreed with the Client. The passage of time; manifestations of latent conditions; or the impact of future events (including (without limitation) changes in policy, legislation, guidelines, scientific knowledge; and changes in interpretation of policy by statutory authorities); may require further investigation or subsequent re-evaluation of the Conclusions.

This Report can only be relied upon for the Permitted Purpose and may not be relied upon for any other purpose. The Report does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise. It is the responsibility of the Client to accept (if the Client so chooses) the Conclusions and implement any recommendations in an appropriate, suitable and timely manner.

Without the express written consent of WSP, any use which a third party makes of this Report or any reliance on (or decisions to be made based on) this Report is at the sole risk of those third parties without recourse to WSP. Third parties should make their own enquiries, rely on the results of their own site inspections, and/or obtain independent advice in relation to any matter dealt with or Conclusions expressed in the Report.

DISCLAIMER

No warranty, undertaking or guarantee whether expressed or implied, is made with respect to the data reported or the Conclusions drawn. To the fullest extent permitted at law, WSP, its related bodies corporate and its officers, employees and agents assumes no responsibility and will not be liable to any third party for, or in relation to any losses, damages or expenses (including any indirect, consequential or punitive losses or damages or any amounts for loss of profit, loss of revenue, loss of opportunity to earn profit, loss of production, loss of contract, increased operational costs, loss of business opportunity, site depredation costs, business interruption or economic loss) of any kind whatsoever, suffered or incurred by a third party.

GLOSSARY

Airborne asbestos	Means any fibres of asbestos small enough to be made airborne. For the purposes of monitoring airborne asbestos fibres, only respirable fibres are counted.
Asbestos	Means the asbestiform varieties of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals, including actinolite asbestos, grunerite (or amosite) asbestos (brown), anthophyllite asbestos, chrysotile asbestos (white), crocidolite asbestos (blue) and tremolite asbestos.
Asbestos Cement (AC)	Means products consisting of sand aggregate and cement reinforced with asbestos fibres (e.g. asbestos cement pipes and flat or corrugated asbestos cement sheets).
Asbestos contaminated dust or debris (ACD)	Means dust or debris that has settled within a workplace and is (or assumed to be) contaminated with asbestos.
Asbestos containing material (ACM)	Means any material, object, product or debris that contains asbestos.
Asbestos-related work	Means work involving asbestos (other than asbestos removal work to which Part 3 of the WorkSafe New Zealand (2016) *Approved Code of Practice for the Management and Removal of Asbestos* applies) that is permitted under the exceptions set out in 7(2), (3) and (4) of the *Health and Safety at Work (Asbestos)Regulations 2016.*
Asbestos removalist	Means a person conducting a business or undertaking who carries out asbestos removal work.

Asbestos removal work	Means: — work involving the removal of asbestos or ACM or asbestos contaminated soil Class A asbestos removal work or Class B asbestos removal work as outlined in Part 6 of the *Health and Safety at Work (Asbestos) Regulations 2016*.
Competent person	Means a person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of specific work.
Dust and debris	Means visible particles, fragments or chunks of material, large and heavy enough to have settled in the work area, that are likely to have originated from ACM.
Friable (Asbestos)	Means asbestos-containing material which, when dry, is or may become crumbled, pulverised or reduced to powder by hand pressure.
Hazard	Anything in the workplace that has the potential to harm people.
In situ	Means fixed or installed in its original position, not having been moved.
Inaccessible areas	Means areas which are difficult to access, such as wall cavities and the interiors of plant and equipment.
Non-Friable (Asbestos)	Means material containing asbestos that is not friable asbestos, includes materials containing asbestos fibres reinforced with a bonding compound.
Person conducting a business or undertaking (PCBU)	A person conducts a business or undertaking: — whether the person conducts a business or undertaking alone or with others; and — whether or not the business or undertaking is conducted for profit or gain.

Person with control	Means, in relation to premises, a person who has control of premises used as a workplace. The person with control may be: — the owner of the premises — a person who has, under any control or lease, an obligation to maintain or repair the premises — a person who is occupying the premises — a person who is able to make decisions about work undertaken at the premises — an employer at the premises.
Respirable asbestos	Means an asbestos fibre that: — is less than 3 microns (µm) wide; — is more than 5 microns (µm) long; and — has a length to width ratio of more than 3:1.
Risk	Means the likelihood of a hazard causing harm to a person.

Appendix A
Site Figures

Figure1: Site overview

Site location:
254 Rangiuru Road, Otaki

Prepared by: Hannah Juchnowicz

Reviewed by: Matthew Taylor

Date: 26/04/2021

3-AK085.00

Key:

Approximate site boundary

Please note that this plan is not drawn to scale. Print in A3 and in colour. Refer to the Asbestos for further extents and comments.

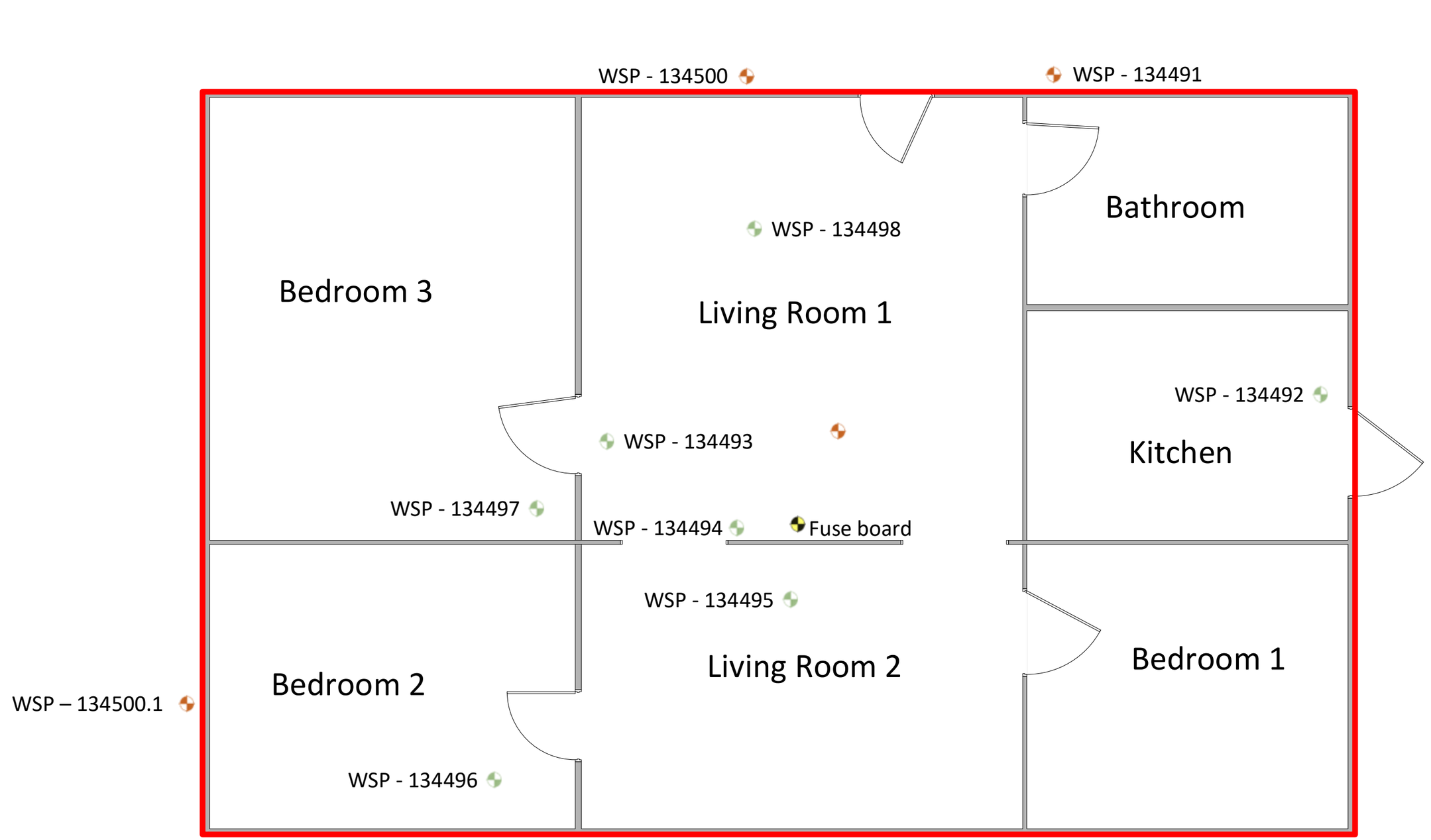

Figure 2: Sampling locations in the house

Site location:
254 Rangiuru Road, Otaki

Prepared by: Hannah Juchnowicz

Reviewed by: Matthew Taylor

Date: 26/04/2021

3-AK085.00

Key:

- Sampling locations – Positive ACM
- Sampling location – Negative ACM
- Assumed material Locations
- Extent of ACM

Please note that this plan is not drawn to scale. Print in A3 and in colour. Refer to the Asbestos for further extents and comments.

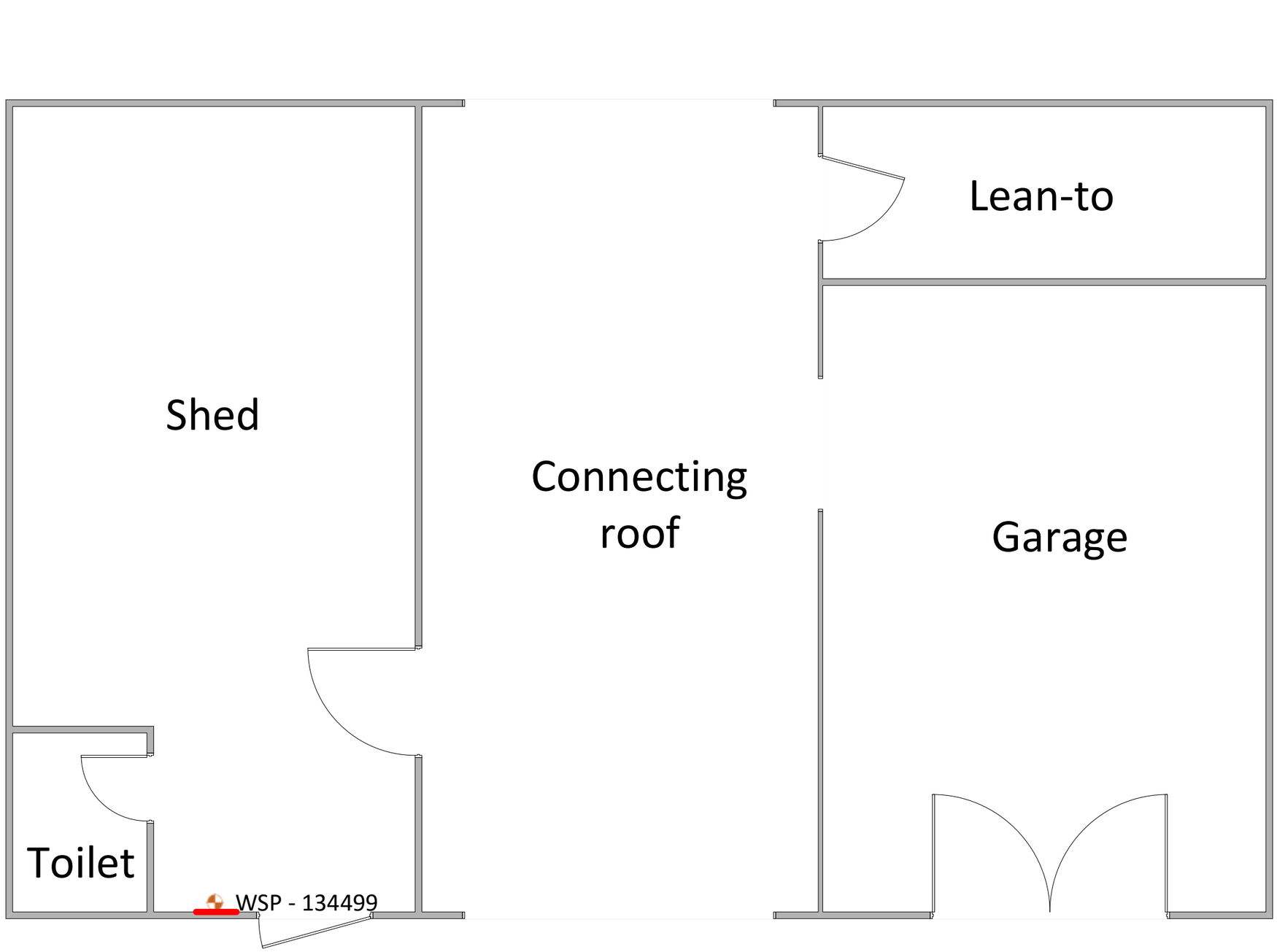

Figure 3: Sampling locations in the shed and garage

Site location:
254 Rangiuru Road, Otaki

Prepared by: Hannah Juchnowicz

Reviewed by: Matthew Taylor

Date: 26/04/2021

3-AK085.00

Key:

- Sampling locations – Positive ACM
- Sampling location – Negative ACM
- Extent of ACM

Please note that this plan is not drawn to scale. Print in A3 and in colour. Refer to the Asbestos for further extents and comments.

Appendix B
Asbestos Register

Asbestos Survey Register

Client: Kapiti Coast District Council
Site Address: 254 Rangiuru Road, Otaki
Date of Survey: 8/04/2021
Name of Surveyor: HJ (WSP NZ Ltd)
Project details: Demolition Survey
Laboratory: Eurofins Environmental NZ

		Location Details				Survey details and Analysis results									Risk & Controls			Reference
Sample ID	Status	Building Locator	Level	Primary Location	Secondary Location	Application	Material	Extent of damage	Surface Treatment	Asbestos Type	Friability	Approximate Extent	Units	Comments	Material Risk Assessment Score	Risk	Recommendation & Control	Photo
WSP-134491	Confirmed	254 Rangiuru Road, Otaki - House	Ground Floor	External	External Cladding	External Cladding	Cement sheeting	Poor	Unsealed cement sheet	Chrysotile	Non-friable	120	m²		6	Medium	Remove	84131
WSP-134500	Confirmed	254 Rangiuru Road, Otaki - House	Ground Floor	Windows	Putty	Putty	Mastic sealant	Poor	Composite	Chrysotile	Non-friable	Unknown	N/A		5	Medium	Remove	84139
WSP-134500.1	Confirmed	254 Rangiuru Road, Otaki - House	Ground Floor	House piles	Packer	Packer	Bituminous material	Good	Composite	Chrysotile	Non-friable	Unknown	N/A		3	Low	Remove	84140
Strongly presumed	Strongly presumed	254 Rangiuru Road, Otaki - House	Ground Floor	Living room 1	Electrical fuse board	Electrical fuse board	Resinous board	Good	Composite	Chrysotile	Non-friable	1	m²		3	Low	Remove	84142
WSP-134499	Confirmed	254 Rangiuru Road, Otaki - Shed	Ground Floor	Southern wall	Electrical fuse board	Electrical fuse board	Resinous board	Good	Composite	Chrysotile	Non-friable	0.1	m²		3	Low	Remove	84141
WSP-134496	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Bedroom 2	Floor covering	Floor covering	Vinyl sheeting	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84136
WSP-134497	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Bedroom 3	Floor covering	Floor covering	Vinyl sheeting	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84137
WSP-134492	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Kitchen	Light switch	Light switch	Reinforced plastics	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84132
WSP-134494	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Living room 1	Light switch	Light switch	Reinforced plastics	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84134
WSP-134493	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Living room 1	Floor covering	Floor covering	Textile	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84138
WSP-134495	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Living room 2	Floor covering	Floor covering	Vinyl sheeting	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84135
WSP-134498	Not present (Tested)	254 Rangiuru Road, Otaki	Ground Floor	Roof	Roofing paper	Roofing paper	Textile	N/A	N/A	Not Detected	N/A	N/A	N/A		N/A	N/A	No action required	84133

Recommendation & Control	Details
No action required	No asbestos has been detected
Leave in situ and manage	The PCBU must clearly indicate the presence and location of this material in accordance with Section 6.12 of the WorkSafe New Zealand (2016) *Approved Code of Practice for the Management and Removal of Asbestos*. The material should be re-inspected at regular intervals in line with legislative requirements and the overarching asbestos management plan (AMP).
Seal/ encapsulate	The PCBU should consider seal/encapsulate to maintain the condition of the asbestos by a suitably competent person. Reinspect at regular intervals.
Enclose	The PCBU should consider enclosing the ACM until further management option becomes viable (removal).
Remove	The PCBU should consider removal of the ACM due to the poor condition. Removal must be undertaken by a Licenced Asbestos Removalist.
Restrict access	Restrict access to the area due to the condition of the asbestos until further notice.
Non-accessed area	This room or area should be assumed to contain asbestos until surveyed and proven otherwise by a competent person.

Appendix C

Representative Photographs of Buildings

254 Rangiuru Road, Otaki - House			
Construction Age	1960s	Asbestos Present	Yes

254 Rangiuru Road, Otaki - Shed			
Construction Age	1960s	Asbestos Present	Yes

254 Rangiuru Road, Otaki - Garage			
Construction Age	1960s	Asbestos Present	No

Appendix D

Representative Photographs of Investigated Materials

ASBESTOS CONTAINING MATERIALS

ASBESTOS - Confirmed				House		Risk:	Medium
Photo Ref	84131	Sample ID	WSP-134491	Room	External		
Application	External Cladding			Material	Cement sheeting		

ASBESTOS - Confirmed				House		Risk:	Medium
Photo Ref	84139	Sample ID	WSP-134500	Room	Windows		
Application	Putty			Material	Mastic sealant		

ASBESTOS - Confirmed				House		Risk:	Low
Photo Ref	84140	Sample ID	WSP-134500.1	Room	House piles		
Application	Packer			Material	Bituminous material		

ASBESTOS - Confirmed				Shed		Risk:	Low
Photo Ref	84141	Sample ID	WSP-134499	Room	Southern wall		
Application	Electrical fuse board			Material	Resinous board		

ASBESTOS - Strongly presumed				House		Risk:	Low
Photo Ref	84142	Sample ID	Strongly presumed	Room	Living room 1		
Application	Electrical fuse board			Material	Resinous board		

NON-ASBESTOS CONTAINING MATERIALS

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84132	Sample ID	WSP-134492	Room	Kitchen
Application	Light switch			Material	Reinforced plastics

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84133	Sample ID	WSP-134498	Room	Roof
Application	Roofing paper			Material	Textile

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84134	Sample ID	WSP-134494	Room	Living room 1
Application	Light switch			Material	Reinforced plastics

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84135	Sample ID	WSP-134495	Room	Living room 2
Application	Floor covering			Material	Vinyl sheeting

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84136	Sample ID	WSP-134496	Room	Bedroom 2
Application	Floor covering			Material	Vinyl sheeting

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84137	Sample ID	WSP-134497	Room	Bedroom 3
Application	Floor covering			Material	Vinyl sheeting

NON-ASBESTOS CONTAINING MATERIAL				House, Ground Floor	
Photo Ref	84138	Sample ID	WSP-134493	Room	Living room 1
Application	Floor covering			Material	Textile

Appendix E

Material Assessment Algorithm

MATERIAL ASSESSMENT ALGORITHM

The material assessment algorithm used is adopted from the WorkSafe New Zealand (2016) *Good Practice Guidelines for Conducting Asbestos Surveys*.

The algorithm is used to assess the potential fibre release of the identified or suspected ACM. The scores of each sample variable influencing fibre release are added together giving an overall score between 1 and 9. The overall score determines the risk level ('Low', 'Medium' or 'High') on the potential fibre release of the ACM.

Sample Variable	Score	Examples of scores
Product type (or debris from product)	1	Asbestos reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi-rigid paints or decorative finishes, asbestos cement etc.
	2	Asbestos insulating board, mill boards, other low density insulation boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper and felt.
	3	Thermal insulation (e.g. pipe and boiler lagging), sprayed asbestos, loose asbestos, asbestos mattresses and packing.
Extent of damage/ deterioration	0	Good condition: no visible damage
	1	Low damage: a few scratches or surface marks; broken edges on boards, tiles etc.
	2	Medium damage: significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres
	3	High damage or delamination of materials, sprays and thermal insulation. Visible asbestos debris
Surface type/ treatment	0	Composite materials containing asbestos: reinforced plastics, resins, vinyl tiles
	1	Enclosed sprays and lagging, asbestos insulating board (with exposed face painted or encapsulated), asbestos cement sheets etc.
	2	Unsealed asbestos insulating board, or encapsulated lagging and sprays
	3	Unsealed laggings and sprayed asbestos

Score	Potential to Release Fibres
7-9	High
4-6	Medium
1-3	Low

Source: Appendix B Material Risk Algorithm, WorkSafe New Zealand Good Practice Guidelines 'Conducting Asbestos Surveys' 2016

For example, an unsealed asbestos insulation board (AIB) with minor damage would be scored the following way.

Product type score = 2
Extent of damage = 1
Surface treatment = 2
Score = 5

Medium risk of fibre release – some management controls would be required.

Appendix F

Laboratory Certificate of Analysis

CHAIN OF CUSTODY RECORD - NEW ZEALAND

Eurofins Environment Testing New Zealand NZBN 9429 04602 4954

☐ **Auckland Laboratory**
35 O'Rorke Road Penrose Auckland 1061 NZ
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☑ **Christchurch Laboratory**
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☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh VIC 3166 AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP NZ Ltd	Project №	3-AK085.00	Project Manager	
Address	L9 Majestic Centre 100 Willis Street, Wellington	Project Name		EDD Format ESdat EQuIS etc	
Contact Name	Hannah Juchnowicz			Sampler(s)	Hannah Juchnowicz
Phone №	027 215 4102			Handed over by	Courier
Special Directions				Email for Invoice	hannah.juchnowicz@wsp.com
Purchase Order	3-AK085.00			Email for Results	hannah.juchnowicz@wsp.com
Quote ID №					

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers Charge container type & size if necessary.

Required Turnaround Time Default will be 5 days if not ticked.

♦Surcharge will apply

☑ 1 day♦ ☐ 2 days♦ ☐ 3 days♦ ☐ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Soil (S) Water (W)	Asbestos presence / absence	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	500mL PFAS PET	Jar (Glass or HDPE)	Ziploc bag	Sample Comments / Dangerous Goods Hazard Warning
1	WSP - 134491 ✓	08/04/21 00:00		1								1	Fibre cement
2	WSP - 134492 ✓	08/04/21 00:00		1								1	Reinforced plastic
3	WSP - 134493 ✓	08/04/21 00:00		1								1	Paper backing
4	WSP - 134494 ✓	08/04/21 00:00		1								1	Reinforced plastic
5	WSP - 134495 ✓	08/04/21 00:00		1								1	Vinyl sheet
6	WSP - 134496 ✓	08/04/21 00:00		1								1	Vinyl sheet
7	WSP - 134497 ✓	08/04/21 00:00		1								1	Vinyl sheet
8	WSP - 134498 ✓	08/04/21 00:00		1								1	Roof paper
9	WSP - 134499 ✓	08/04/21 00:00		1								1	Resionous board
10	WSP - 134500 ✓	08/04/21 00:00		1								1	Putty
				1								1	

Date/Time: 14/4/21 / 09:14

Chilled: (Yes) / No

Temp: 18.4

Correction: 0.2

Final Temp: 18.6

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Hannah Juchnowicz	Signature		Date	09/04/2021	Time	
Eurofins Laboratory Use Only	Received By		AKL | WLG | (CHC) | MEL	Signature		Date	14/4/21	Time	09:14	Temperature	18.6
	Received By		AKL | WLG | CHC | MEL	Signature		Date		Time		Report №	

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

WSP New Zealand Limited
Level 9 Majestic Centre, 100 Willis Street
Wellington
New Zealand 6144

Attention:	Hannah Juchnowicz
Report	786909-AID
Project Name	
Project ID	3 - AK085.00
Received Date	Apr 14, 2021
Date Reported	Apr 15, 2021

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 3 - AK085.00
Date Sampled Apr 08, 2021
Report 786909-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
WSP - 134491	21-Ap19510	Apr 08, 2021	Approximate Sample 33g / 60 x 68 x 13mm Sample consisted of: Fibre cement	Chrysotile and amosite asbestos detected. Organic fibre detected.
WSP - 134492	21-Ap19511	Apr 08, 2021	Approximate Sample 1g / 14 x 10 x 1 mm Sample consisted of: Reinforced plastic	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
WSP - 134493	21-Ap19512	Apr 08, 2021	Approximate Sample 1g / 19 x 9 x 1mm Sample consisted of: Backing paper	No asbestos detected. Organic fibre detected. No respirable fibres detected.
WSP - 134494	21-Ap19513	Apr 08, 2021	Approximate Sample 1g / 17 x 11 x 1mm Sample consisted of: Reinforced plastic	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
WSP - 134495	21-Ap19514	Apr 08, 2021	Approximate Sample 2g / 25 x 18 x 2 mm Sample consisted of: Vinyl flooring	No asbestos detected. Organic fibre detected. No respirable fibres detected.
WSP - 134496	21-Ap19515	Apr 08, 2021	Approximate Sample 2g / 32 x 24 x 1 mm Sample consisted of: Vinyl flooring	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
WSP - 134497	21-Ap19516	Apr 08, 2021	Approximate Sample 2g / 12 x 22 x 1 mm Sample consisted of: Bituminous vinyl flooring	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
WSP - 134498	21-Ap19517	Apr 08, 2021	Approximate Sample 2g / 60 x 60 x 1mm Sample consisted of: Fibrous paper	No asbestos detected. Organic fibre detected. No respirable fibres detected.
WSP - 134499	21-Ap19518	Apr 08, 2021	Approximate Sample 2g / 7 x 4 x 2 mm Sample consisted of: Bituminous material	Chrysotile asbestos detected. Organic fibre detected.Synthetic mineral fibre detected.
WSP - 134500	21-Ap19519	Apr 08, 2021	Approximate Sample 4g / 29 x 11 x 6mm Sample consisted of: Putty material	Chrysotile asbestos detected. Organic fibre detected. Synthetic mineral fibre detected.
WSP - 134500.1	21-Ap19520	Apr 08, 2021	Approximate Sample 2g / 10 x 10 x 1mm Sample consisted of: Bituminous material	Chrysotile asbestos detected. Organic fibre detected. Synthetic mineral fibre detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Apr 14, 2021	Indefinite

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NATA # 1261
Site # 23736

Newcastle
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Company Name: WSP New Zealand Limited
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Wellington
New Zealand 6144

Project Name:
Project ID: 3 - AK085.00

Order No.:
Report #: 786909
Phone: 0011 64 4 471 7160
Fax:

Received: Apr 14, 2021 9:14 AM
Due: Apr 15, 2021
Priority: 1 Day
Contact Name: Hannah Juchnowicz

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						Asbestos Absence /Presence
Auckland Laboratory - IANZ# 1327						
Christchurch Laboratory - IANZ# 1290						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	WSP - 134491	Apr 08, 2021		Building Materials	Z21-Ap19510	X
2	WSP - 134492	Apr 08, 2021		Building Materials	Z21-Ap19511	X
3	WSP - 134493	Apr 08, 2021		Building Materials	Z21-Ap19512	X
4	WSP - 134494	Apr 08, 2021		Building Materials	Z21-Ap19513	X
5	WSP - 134495	Apr 08, 2021		Building Materials	Z21-Ap19514	X
6	WSP - 134496	Apr 08, 2021		Building Materials	Z21-Ap19515	X
7	WSP - 134497	Apr 08, 2021		Building Materials	Z21-Ap19516	X

eurofins | Environment Testing

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Company Name: WSP New Zealand Limited
Address: Level 9 Majestic Centre, 100 Willis Street
Wellington
New Zealand 6144

Project Name:
Project ID: 3 - AK085.00

Order No.:
Report #: 786909
Phone: 0011 64 4 471 7160
Fax:

Received: Apr 14, 2021 9:14 AM
Due: Apr 15, 2021
Priority: 1 Day
Contact Name: Hannah Juchnowicz

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						Asbestos Absence /Presence
Auckland Laboratory - IANZ# 1327						
Christchurch Laboratory - IANZ# 1290						X
External Laboratory						
8	WSP - 134498	Apr 08, 2021		Building Materials	Z21-Ap19517	X
9	WSP - 134499	Apr 08, 2021		Building Materials	Z21-Ap19518	X
10	WSP - 134500	Apr 08, 2021		Building Materials	Z21-Ap19519	X
11	WSP - 134500.1	Apr 08, 2021		Building Materials	Z21-Ap19520	X
Test Counts						11

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Destiny Cruickshanks	Senior Analyst-Asbestos (NZS)

Authorised by:

Katyana Gausel	Senior Analyst-Asbestos (Key Technical Personnel) (NZS)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix G

Legislation and References

LEGISLATIIVE REQUIREMENTS

Asbestos Survey Requirements	Asbestos Re-survey Requirements	Reporting Requirements	Management and Labelling/Signage Requirements	Other Requirements
If a workplace PCBU knows, or ought to know, there is a risk of exposure to respirable asbestos fibres in their workplace, it must so far as reasonably practicable, identify all ACM in the workplace relating to the risk through.: — Surveying to identify and locate any ACM; and — Compiling and keeping at the workplace a site-specific asbestos register. If ACM is identified at the workplace, an asbestos management plan (AMP) is to be compiled for the management of the identified ACM under regulation 13 of the *Health and Safety at Work (Asbestos) Regulation 2016.* The asbestos register and the asbestos management plan (AMP) must be made available at the workplace for workers, people intending to conduct business at the workplace and to Health and Safety representatives.	The requirements for re-inspections of identified ACM are determined on a case-by-case basis depending on the risk situation and should be informed by and conducted in accordance with the site-specific AMP. Re-inspections should be undertaken at intervals of no greater than 5 years.	The site-specific asbestos register must include the date, type, location, condition and ACM identified during the survey. The asbestos register must be maintained and updated if: — The AMP is under review; and/or — Further ACM is identified; and/or — ACM is removed, disturbed or encapsulated. The site-specific AMP must include management actions and justifications, incident and emergency response plans and record details of works carried out that involves ACM at the workplace. The AMP must be maintained and updated: — When the asbestos register is under review (at least 5 yearly); and — If asbestos is removed, disturbed or encapsulated; and — If the AMP is no longer adequate for managing the ACM on site.	The PCBU must clearly indicate the presence and location of this material in accordance with Section 6.12 of the WorkSafe New Zealand (2016) *Approved Code of Practice for the Management and Removal of Asbestos*. The material should be re-inspected at regular intervals in line with legislative requirements and the site AMP. Health monitoring is required for all workers involved in asbestos removal works or asbestos-related work if they are at risk of exposure. Training is required for persons involved in asbestos removal work or carrying out asbestos-related works. In efforts to maintain the condition of ACM and minimise the exposure risk, there are main four types of management control options: – leave in-situ – encapsulate or seal – enclosing with a physical barrier – removal Should removal be considered, the PCBU may require a licensed asbestos removalist depending on the type and amount of asbestos or ACM to be removed under Regulation 27 of the *Health and Safety at Work (asbestos) Regulations 2016.*	Under Regulation 7 of the *Health and Safety at Work (Asbestos) Regulation 2016, requires* a PCBU must not carry out, or direct or allow a worker to carry out, work involving asbestos; excepting as is applicable: — Managing risk — Sampling, identification and analysis — Maintenance — Removal/disposal — Other exemptions per subclause 1 (2)/ subclause 2 of the asbestos regulations

			Refer to section 24 of the WorkSafe New Zealand *Approved Code of Practice Management and Removal of Asbestos 2016.*	

REFERENCES

It is recommended that the following documents be read in conjunction with this report:

- *Health and Safety at Work Act 2015*.
- *Health and Safety at Work (Asbestos) Regulations 2016*.
- *Health and Safety at Work (General Risk and Workplace Management) Regulations 2016*.
- WorkSafe New Zealand 2016, *Approved Code of Practice for the Management and Removal of Asbestos*.
- WorkSafe New Zealand 2016, *Good Practice Guidelines for Conducting Asbestos Surveys*.

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Kapiti Coast District Council

254 RANGIURU ROAD, OTAKI

DETAILED SITE INVESTIGATION

28 APRIL 2021

CONFIDENTIAL

Question today
Imagine tomorrow
Create for the future

254 RANGIURU ROAD, OTAKI
DETAILED SITE INVESTIGATION

Kapiti Coast District Council

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REV	DATE	DETAILS
A	28 April 2021	Final

	NAME	DATE	SIGNATURE
Prepared by:	Hannah Juchnowicz	28 April 2021	
Reviewed and approved by:	Stephen Thomson	28 April 2021	

This report ('Report') has been prepared by WSP exclusively for Kapiti Coast District Council ('Client') in relation to soil contamination at 254 Rangiuru Road, Otaki ('Purpose') and in accordance with Short form Agreement with the Client dated 1 April 2021 and WSP proposal "254 Rangiuru Road, Otaki: Preliminary and Detailed Site Investigation" dated 31 March 2021. The findings in this Report are based on and are subject to the assumptions specified in this Report and WSP proposal "254 Rangiuru Road, Otaki: Preliminary and Detailed Site Investigation" dated 31 March 2021. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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EXECUTIVE SUMMARY

WSP New Zealand Limited (WSP) undertook a Detailed Site Investigation (DSI) at 254 Rangiuru Road, Otaki ('the site') on behalf of Kapiti Coast District Council (KCDC) to as part of their due diligence in regard to potentially purchasing and developing the property.

The property has been used as a market garden since pre 1948 till late 2010.

The desktop study identified three activities listed on the Hazardous Activities and Industries List (HAIL) that apply to the property:

- A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
- E1: Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition
- I: Any other land that has been the subject to intentional or accidental release of a hazardous substance in sufficient quantity that it could be an unacceptable risk to human health or the environment

Soil analysis confirmed that pesticides have been used across the majority of the site. However residual levels remaining are not expected to pose an unacceptable risk to human health. Any risk posed can be managed during future development works with the implementation of an erosion and sediment control plan.

The house, in the south-east corner of the site, is clad in deteriorated, unpainted, asbestos containing, fibre cement sheeting. This has resulted in low levels of asbestos in soil on the north side of the shed. The extent of this is unknown.

The soil sampling undertaken as part of this investigation confirms the following:

- The soils across the site contain analytes at concentrations that exceed the Wellington Regional background concentrations.
- The soils around the buildings and in the south east corner of the site contain concentrations of asbestos, arsenic and lead that exceeds human health guidelines. With the exception of one sediment sample collected form the drain no other exceedances of human health criteria were detected on soil samples collected from other areas of the site.
- One sample from the sediment within the drain contained arsenic slightly above human health criteria.

RECOMMENDATIONS

Given the presence of contaminants of concern above Wellington Regional background concentrations and/or human health criteria, WSP recommend the following further works:

- If the land is to be developed into a residential landuse a resource consent will be required under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
- The consent will require a remediation action plan (RAP) and a Site Management Plan (SMP) to be prepared.

- Any soil disturbance around the buildings will need to be undertaken as “asbestos related work”.
- If impacted soils are to remain on site after development/remediation a long-term management plan will be required to ensure remaining soil contamination is managed appropriately to limit exposure to site occupies or users.

Prior to development of the site, this area will be required to undergo a soil scrape by a Class B licensed asbestos removal contractor to mitigate the risk to human health posed by the asbestos.

It is recommended that once development plans for the site have been finalised, that the results in this report are re-assessed with the site development in mind. Further investigations may be required.

1 PROJECT BACKGROUND

1.1 OVERVIEW

WSP New Zealand Limited (WSP) has been engaged by Kapiti Coast District Council (KCDC) to undertake a Detailed Site Investigation (DSI) at 254 Rangiuru Road, Otaki ('the site'). The DSI was undertaken as part of their due diligence in regard to potentially purchasing and developing the property. The site location is provided in Figure 1 in Appendix A.

1.2 OBJECTIVES

The objectives of the DSI are to:

- Establish current contaminant concentrations in soil at the site (if any).
- Assess the suitability of the site for residential land use.
- Provide recommendations for areas requiring remediation for the site to meet the land use criteria listed above.

This DSI report does not report on the findings of the asbestos survey undertaken on the site buildings. This has been reported separately.

1.3 SCOPE

To provide the services commensurate with the objectives and rationale described above, WSP completed the following scope of work:

1.3.1 DESK STUDY REVIEW

The scope of works included a desk-based review of current and historical background information. As part of this, the following information sources were reviewed:

- Review of Council held information including the location of ground water bores, and any information held on the Greater Wellington Regional Council (GWRC) Selected Land Use Register (SLUR).
- Review of available historical aerial photographs obtained from Land Information New Zealand (LINZ), Retrolens, and Google Earth.
- Review of local geology and hydrogeology.

1.3.2 DETAILED SITE INVESTIGATION:

The DSI scope of works included the following upon completion of the desk study review:

- The collection of surficial soil samples for analysis at an International Accreditation New Zealand (IANZ) accredited laboratory for analysis of identified contaminants of concern.
- Comparisons of laboratory analytical results against relevant soil guideline values (SGV).
- Preparation of this report presenting and assessing the results of the investigation.

This investigation has been undertaken with reference to the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG) No. 5: Site Investigation and Analysis of Soils (Revised 2011)(MfE, 2011a), and reported with reference to the MfE CLMG No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2011)(MfE, 2011b).

2 SITE LOCATION

2.1 SITE IDENTIFICATION

The site is situated along Rangiuru Road, approximately 2 km to the north-west of Otaki township and State Highway 1 (SH1).

Table 2-1: Site Identification Details

Site Address	254 Rangiuru Road, Otaki
Legal Description	Part Te Ahitangutu 16 Block
Size	1.077 ha
Current Site Use	Rural

2.2 SURROUNDING ENVIRONMENT1

The site is bordered by lifestyle blocks and rural farmland to the west and residential to the east. The Te Kura-ā-Iwi O Whakatupuranga Rua Mano school is located immediately adjacent to the north and Rangiuru Road immediately to the south.

2.3 GEOLOGY

The geology of the surrounding Otaki area comprises a thick sequence of late Quaternary glacial and interglacial deposits with observed postglacial river entrenchment along the Otaki River and the Waitohu Stream (2 km north-east of the site). The investigation area itself sits in late Quaternary alluvial terrace remnants which extend from the Tararua foothills 5.5 km to the east (GWRC, 2014).

2.4 SURFACE AND GROUNDWATER

The Holocene alluvium and reworked late Quaternary gravels underlying the floodplain of the Otaki River and Waitohu Stream host a highly permeable unconfined/semiconfined aquifer system which exhibits a high degree of hydraulic connection with surface water (GWRC, 2014). The nearest surface water is the Otaki River approximately 1.5 km to the south-west of the site.

KCDC holds information for four wells located within 200 m of the site. Information for these wells is included in Table 2-2.

Table 2-2: Information for wells located with 200 m of the site

WELL NUMBER	WELL STATUS	DISTANCE FROM SITE (m)	WELL OWNER	WELL DEPTH (m)	USE
Unknown	Unknown	150	Unknown	Unknown	Unknown
S25/5318	Unknown	108	Unknown	Unknown	Unknown

WELL NUMBER	WELL STATUS	DISTANCE FROM SITE (m)	WELL OWNER	WELL DEPTH (m)	USE
BN33/0027	Unknown	103	237 Rangiuru Road	4	Bore
S25/5317	Unknown	88	Unknown	Unknown	Bore

3 EXISTING INFORMATION REVIEW

3.1 HISTORICAL AERIAL REVIEW

Historical aerial photographs for the site have been sourced from KCDC Map Viewer (KCDC, 2021 – accessed 07 April 2021), Retrolens (Retrolens, 2021 – accessed 07 April 2021) and Google Earth Professional (Google Earth, 2021 – accessed 07 April 2021) for the years from 1948 - 2021. The aerial photographs have been reviewed to identify any changes in land use activities within the site, and within the surrounding properties, with the observations outlined in Table 3-1. Copies of the aerial photographs have been included in Appendix B.

Table 3-1: Historical aerial photograph review

YEAR	THE SITE	SURROUNDING AREA
1948	— Most of the site appears to be used for the growing of crops. — Two lines of unknown circular items are situated leading from the eastern boundary to the midline of the site. — The present-day drainage ditch is in its current position running south-east to north-west. — There is a line of large trees on the northern boundary. — What appears to be a house is present in the south-eastern corner of the site.	— The northern boundary consists of farmland — The eastern boundary also appears to be used for crop cultivation. — There are approximately 3 buildings of unknown use situated immediately on the eastern boundary. — The southern boundary is bordered by Rangiuru Rd with cultivated farmland beyond this. — The western boundary appears to be grazing land with a residential house.
1957	— The two lines of circular objects have been removed. — Two new buildings have been constructed in the south-eastern corner of the site. The southern of the two appears to be the residential building situated on the site in the present day.	The land on the northern and western boundaries appear to have been sewn with crops.
1967	Glass House 2 has been constructed on the north side of the potential house in the south-eastern corner of the site.	The land on the eastern boundary has been subdivided and four residential houses have been built here.
1978	The crops sewn on the western side of the drainage ditch appear to have been combined with the property on the western boundary into one large field.	No discernible changes since 1967.

YEAR	THE SITE	SURROUNDING AREA
1983	No discernible changes since 1978.	The land on the northern boundary appears to have been converted back to grazing land.
1998	The potential residential house in the south-eastern corner has been demolished.	No discernible changes since 1983.
2001	— A long tunnel house has been constructed along the eastern boundary. — Glass house 1 has been constructed between the tunnel house and glass house 2. — The western boundary fence has been reinstated. — There is a large number of unknown items stored outside in the south-eastern corner of the property.	The land on the western boundary has been converted back into grazing land.
2007	Glasshouse 1 has been demolished	No discernible changes since 2001.
2010	A number of the unknown items stored outside in the south-eastern corner of the property have been removed.	No discernible changes since 2007.
2013	The external cladding of glass house 2 appears to have been removed however the supporting structure appears to still be standing.	Nga Purapura, part of the Te Wānanga o Raukawa, Otaki Campus has been constructed on the northern boundary.
2017	The tunnel house and the remaining structure of glass house 2 have been removed.	No discernible changes since 2017.
2021	— The majority of the wider property is no longer cultivated for crops and appears to have been cut for hay with several large rounds of hay still sitting in the fields. — The south-eastern corner of the property appears to be highly overgrown with foliage growing over the top of the two remaining buildings.	The property on the south side of Rangiuru Rd is also no longer cultivated for crops and appears to have been cut for hay.

3.2 REGIONAL COUNCIL INFORMATION

The SLUR is a register of sites GWRC consider have been, or currently are, the location of activities or industries included on the Ministry for the Environment's (MfE, 2011c) Hazardous Activities and Industries List (HAIL). A list of current or historical HAIL activities identified on the SLUR on or within the 200 m of the site, are presented in Table 3-2.

Table 3-2: Relevant HAIL Activities and Descriptions from GWRC's SLUR

HAIL SITE ID	HAIL SITE NAME	APPROXIMATE DISTANCE FROM THE SITE	HAIL ACTIVITY	SLUR CATEGORY
SN/01/103/02	Otaki Automotive Services	160 m east	F7: Vehicle refuelling, service and repair	Verified History of Hazardous Activity or Industry

3.3 DISTRICT COUNCIL INFORMATION

The property file for the site was requested from KCDC on 7 April 2021. A KCDC representative advised on 12 April 2021 that no electronic or paper files are held for the site and it was unknown if this was because the files had been misplaced or if no files had ever been held.

3.4 SITE WALKOVER

A site walkover was undertaken on 8 April 2021 as part of this investigation, site photos are available in Appendix C. The following features were identified:

- The majority of the site comprised vacant land covered with short to medium clover grass, which was fenced along the Rangiuru Road boundary to the south, rural/lifestyle properties west, The Te Kura-ā-Iwi O Whakatupuranga Rua Mano school to the north, and residential dwellings to the east.
- The topography was relatively flat across the site, with a drainage ditch running south-east to north-west from just north of the in-situ sheds to the north-western corner of the site. The drainage ditch has waste in it including plastic, large concrete pipes, and small metal pipes
- A house shed and garage (all in a state of disrepair) were present in the south-east corner of the site.
- The house was clad in un-painted asbestos containing fibre cement sheeting with a corrugated iron roof. The roof had rusted through in several rooms and a number of the windows were broken or missing. Personnel belongings were strewn through the rooms. There was a blue plastic drum sitting outside the kitchen door. It was full of liquid, potentially water as there was a crack in the lid. A rusted metal drum was sitting on the ground at the midpoint of the southern wall of the house. It was filled with an unknown liquid and gave off an odour similar to petrol. The asbestos containing fibre cement sheet external wall cladding on the southern wall has been damaged extensively and fragments are sitting in the soil adjacent.

- The shed had almost entirely collapsed in on itself, consisted of a corrugated iron roof, and wooden exterior walls with a toilet in the south-west corner. The northern end of the shed could only be viewed from the door as the roof had fallen in, but there was a large number of items stored there including stacks of wooden sheets and old whiteware appliances.
- The garage was of wooden construction with a corrugated iron room. There was old straw stored at the back and miscellaneous items stored on shelving on the eastern wall including pieces of machinery, jerry cans of unknown content and plastic containers marked as poison (Sumisclex 25 fungicide). At the back the garage was a lean-to which had a number of rusted metal drums stored in it. The contents of these drums (if any) is unknown. No access was gained to his lean-to due to the amount of items store in there and the fact the door has fallen in and was overgrown, but the contents (including old furniture, and a vacuum cleaner) were viewed through the back wall of the garage as the wall cladding was missing.
- The ground surface in the south-eastern corner between the buildings and the eastern boundary fence was very hummocky, potentially from previous soil disturbance. This area of the site was highly overgrown with a thick layer of the crawling plants Tradescantia fluminensis (wandering jew) and Hedera helix (common ivy) making more observations of the ground surface in this area difficult. There appeared to be several pieces of dilapidated machinery in this area though again identification was difficult with the plant cover. There was also a pile of building rubble thought to be the remains of Glass House 2 (as identified in the aerial review) and a large amount of plastic bag material spread through the trees and undergrowth on the north and east sides of the in-situ sheds.
- In the centre of the site, adjacent to the drainage ditch is an open water well of unknown depth. Water was visible approximately 5 m below ground level. It is covered by a rectangular block of concrete.

4 IDENTIFICATION OF HAIL ACTIVITIES

WSP have undertaken a desktop review of available information, and a site walkover to assess if it more likely than not that industries or activities described in the MfE HAIL database (MfE, 2011c) are occurring or have historically been undertaken on the site. The review identified multiple potential HAIL activities based on the available evidence.

The HAIL activities that have potentially occurred at the site are summarised in Table 4-1.

Table 4-1: Identified HAIL activities and contaminants of potential concern

ACTIVITY	HAIL CODE	AREA OF SITE AFFECTED	CONTAMINANTS OF POTENTIAL CONCERN
Market gardening including a tunnel house and two glass houses	A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds	Whole property	— Acid herbicides — Pesticides — Heavy metals
Building materials in poor condition including asbestos containing materials	E1: Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition	South-east corner of the property	— Asbestos
Uncontrolled demolition of structures and storage of unknown items associated with the running of a market garden	I: Any other land that has been the subject to intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment	South-east corner of the property	— Asbestos — Heavy metals — Pesticides — Acid herbicides — TPH — PAH

5 SITE INVESTIGATION

5.1 SAMPLING AND ANALYSIS RATIONALE

The application of herbicides and pesticides is expected to have been applied in a uniform broad scale application which is likely to have resulted in low level uniform contamination. As such a grid sampling approach with composite sampling was adopted for the wider horticultural areas of the site in line with the MfE CLMG No. 5: Site Investigation and Analysis of Soils (Revised 2011) (MfE, 2011a). The horticulture areas where divided into four discrete areas (labelled C1 to C4). Three or four soils samples were collected from each area and composited into one sample for each area. Additionally, a discrete sample was collected from area C2, C3 and C4 for comparison to the composite sample analysis results.

The historical aerial review identified that the area between the in-situ buildings and the eastern boundary had previously been the site for both a house, and for apparent storage of a large number of unidentified items spread across the area. As such a grid sampling approach was considered appropriate for this area.

A targeted sampling approach was adopted for the investigation of contaminants of concern surrounding the in-situ buildings as potential heavy metal and asbestos contamination is unlikely to have spread far from the source material, in this case the building cladding.

A targeted sampling approach was also adopted for the glass houses as the application of herbicides and pesticides is expected to have been contained within the structures themselves.

Sample locations are outlined in the site plan provided in Figure 2, Appendix A.

A full summary of analysis commissioned is included in the Chain of Custody (CoC) attached in Appendix D.

A summary of the adopted sampling and analysis plan is provided in Table 5-1 below.

Table 5-1: Sample Analysis Plan

HAIL ACTIVITY	SAMPLE LOCATION	SAMPLE NAMES	SAMPLES COMBINED AS A COMPOSITE BY LABORATORY	FINAL SAMPLES ANALYSED	SELECTED ANALYSIS
Market gardening including a tunnel house and two glass houses	Wider fields	C1-1 – C1-3. C2-1 – C2-4, C3-1 – C3-5, C4-1 – C4-5	Yes	C1-1 – C1-3 = Comp C1 C2-1 – C2-3 = Comp C2 C3-1 – C3-4 = Comp C3 C4-2 – C4-5 = Comp C4 C2-4, C3-5, C4-1 (discrete samples)	— Organophosphorus pesticides (OPP). — Organochlorine pesticides (OCP). — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc).
	Drainage ditch	D1 – D3	No	D1- D3	— OPP. — OCP. — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc).
	Tunnel house	T1 – T3	Yes	T1 – T3 = Comp T	— OPP. — OCP. — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc).
	Glass house 1	G1-1 – G1-2	Yes	G1-1 – G1-2 = Comp G1	— OPP. — OCP. — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc).

HAIL ACTIVITY	SAMPLE LOCATION	SAMPLE NAMES	SAMPLES COMBINED AS A COMPOSITE BY LABORATORY	FINAL SAMPLES ANALYSED	SELECTED ANALYSIS
Market gardening including a tunnel house and two glass houses	Glass house 2	G2	No	G2	— OPP. — OCP. — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc).
Building materials in a deteriorated condition including asbestos containing materials and potential lead containing paint	In-situ building in south-east corner of the property	B1 – B5	No	B1 – B5	— Asbestos. — Lead – Samples B1-B3. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc) – Samples B4-B5 only. — TPH – Samples B4 and B5 only. — PAH – Samples B4 and B5 only. — OPP – Sample B1 only. — OCP – Sample B1 only.
Uncontrolled demolition of structures and storage of unknown items associated with the running of a market garden	Former rubbish piles in south-east corner of the property	R1 – R5	No	R1 – R5	— OPP. — OCP. — Acidic herbicides. — Heavy metal (arsenic cadmium chromium, copper, lead, mercury, nickel, zinc). — TPH. — PAH.

5.2 SAMPLING METHODOLOGY

The fieldwork was undertaken on Thursday 8th and Friday 9th April 2021. Weather on the day was fine and warm. Thirty-six surficial soil samples were collected by hand using a spade or a garden trowel. A clean pair of nitrile gloves was worn for each sample to prevent cross-contamination.

Samples were collected in laboratory supplied containers and stored in on ice in a cooler prior to dispatch to Eurofins Environmental Testing NZ Limited (Eurofins) for analysis.

All sampling equipment was decontaminated between sampling locations using DECON 90. When sampling in areas where asbestos was a contaminant of concern, sampling equipment was first wiped down with wet wipes prior to decontamination with DECON 90. All used wet wipes were disposed of as asbestos contaminated waste.

Field sampling and relevant sampling management procedures were undertaken in general accordance with the MfE Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis (2011a) and the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (NZGAMAS, 2017).

All chemical laboratory analysis was undertaken by Eurofins. Copies of the laboratory certificates of analysis and chain of custody are included in Appendix D.

6 BASIS FOR GUIDELINE CRITERIA

6.1 HIERARCHY OF SELECTION

This section summarises the reference sources for guideline values that we have adopted for the potential; future residential land use of the site. The selected guidelines have been based on the MfE CLMG No. 2, Hierarchy and Application in New Zealand of Environmental Guideline Values, (Revised 2011) (MfE, 2011d).

6.1.1 ASSESSMENT OF HUMAN HEALTH RISK

Assessment criteria for a 'residential' land use scenario have been adopted which is considered appropriate for the end land use of the site. The following guidelines were used:

- Resource Management (National Environment Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) - Soil Contaminant Standards for a 'Residential' scenario.
- Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE, 2011e). Values applicable to 'Residential' land use for a 'sand' soil type at <1m depth have been selected.
- Guideline on the Investigation Levels for Soil and Groundwater (NEPM, 2011) - Schedule B7 Appendix A1. Values applicable for a residential landuse have been selected.

6.1.2 BACKGROUND CONCENTRATIONS

For the purpose of comparison with background soil concentrations to determine re-use or off-site disposal options for any spoil generated during future construction works, the following document has been adopted:

- URS New Zealand Limited (URS), Determination of Common Pollutant Background Soil Concentrations for the Wellington Region, Table ES - 1, Target Analyte Background Soil Concentration Ranges for the Wellington Region – Main Soil Type 3 (Hutt Alluvium) (URS, 2003).

Where there is not a published background concentration for non-naturally occurring compounds (TPH. OCPs and most PAHs), the background concentration is consisted to be the laboratory LOR.

6.1.3 ADJUSTMENT OF GUIDELINE CRITERIA OR ANALYTICAL RESULTS TO ALLOW FOR COMPOSITING

Typically, when compositing soil samples either the guideline criteria or the analytical results are adjusted to conservatively allow for the "dilution" of the detected concentrations as a result of compositing of the samples. By doing this it assumes that the concentration detected could conservatively be X number of samples composited higher than detected. For example, if four samples are composited into one sample for analysis then the concentrations detected could be four time higher. This can either be addressed by multiplying the concentrations detected by the number of samples composited or the guideline value can be divided by the number of samples composited.

For this investigation along with collecting samples for composting from the horticulture fields WSP also collected one discrete sample from three of the four fields. The analytical results for the composited and discrete samples were compared by calculating the relative percentage difference (RPD) between each analyte detected above the laboratory limit of reporting (LOR). For this investigation the results were very similar between the composite samples submitted for analysis and the discrete samples with relative RDP ranging between 0 and 111%, with most of the calculated RPDs less than 50%. Where the RPD are greater than 50% the concentrations detected are very low resulting in minor changes in concentrations causing big variances in RPD Based on the similarity between the analytical results for the composite and discrete sample analytical results WSP has not adjusted the adopted guideline values or analytical results to allow for compositing

7 INVESTIGATION FINDINGS

7.1 SOIL CONDITIONS

During the investigation there was no evidence of visible staining or detectable odours in or from the soils sampled, though a petroleum like odour was noted to be coming from a rusted drum sitting adjacent soil sample B4.

The ground around soil sample B4 was also noted to have potential asbestos containing fibre cement sheet debris sitting on the surface.

Site wide the soil appeared to generally consist of reworked natural or natural silty sands. The soil beneath what was the tunnel house was noted to be particularly compacted.

7.2 ANALYTICAL RESULTS

7.2.1 SUMMARY OF SOIL ANALYTICAL RESULTS

A summary of surface soil analytical exceedances is included in Table 7-1, while a more detailed results assessment is included in Sections 7.2.2 – 7.2.6. A full summary table of results with the applicable background concentrations and human health criteria is provided in Appendix E.

Table 7-1: Summary of exceedances

AREA ON SITE	BACKGROUND CONCENTRATION (mg/kg)	HUMAN HEALTH GUIDELINE VALUE (mg/kg)
Historical Horticultural Activity	Yes – heavy metals	No
Drainage Ditch	Yes – heavy metals	Yes – Arsenic
Tunnel House, Glass House 1 And Glass House 2	Yes – heavy metals	No
In Situ Buildings	Yes – heavy metals and TPH	Yes – Arsenic, lead and Asbestos
South-East Corner of The Site	Yes – heavy metals and TPH	Yes – Lead

7.2.2 HISTORICAL HORTICULTURAL ACTIVITY – COMPOSITE GRID SAMPLING

7.2.2.1 HEAVY METALS

All eight heavy metals were detected above laboratory limit of reporting (LOR) in all soil samples collected across the horticultural fields. Based comparison with the guideline values the following has been determined:

- All samples collected from the former horticultural fields contained arsenic, cadmium, chromium, copper and mercury above the Wellington Regional background concentrations.
- All sample concentrations were below the adopted human health criteria.

7.2.2.2 PESTICIDES

All samples collected from the former horticultural fields contained at least one or more OCP analytes above laboratory LOR. Based comparison with the guideline values the following has been determined

- All samples contained concentrations of OCPs above the Wellington Region background concentrations
- All samples OCP concentrations were below the adopted human health criteria.

All samples contained OPP and acid herbicides below laboratory LOR and therefore below the Wellington Region background concentrations and the adopted human health criteria.

7.2.3 DRAINAGE DITCH

7.2.3.1 HEAVY METALS

All samples collected from the drainage ditch contained at least one or more heavy metal analyte above laboratory LOR and Wellington Region background concentrations. The exception was the concentrations of lead and nickel were below the background concentration.

One sample (D2) collected from approximately the middle of the drain contained a concentration of arsenic above the adopted human health criteria.

7.2.3.2 PESTICIDES

All samples collected from the drainage ditch contained at least one or more OCP analytes above laboratory LOR and therefore the background concentrations. All samples concentrations were below the adopted human health criteria.

All samples contained OPP and acid herbicides below laboratory LOR and therefore below the adopted human health criteria.

7.2.4 TUNNEL HOUSE, GLASS HOUSE 1 AND GLASS HOUSE 2

7.2.4.1 HEAVY METALS

All samples collected from the tunnel house and two glass houses contained at least one or more heavy metal analytes above laboratory limit of reporting (LOR) and Wellington Region

background concentrations. The exception was that the concentration of nickel was below the background concentrations.

All sample concentrations were below the adopted human health criteria.

7.2.4.2 PESTICIDES

All samples collected from the tunnel house and two glass houses contained at least one or more OCP analytes above laboratory LOR. All samples concentrations were below the adopted human health criteria.

All samples contained OPP and acid herbicides below laboratory LOR and therefore below the adopted human health criteria.

7.2.5 AROUND BUILDINGS

7.2.5.1 HEAVY METALS

All samples collected from around the buildings contained at least one or more heavy metal analytes above laboratory limit of reporting (LOR) and Wellington Region background concentrations. The exception was that the concentration of nickel was below the background concentrations.

One sample (B4) collected on the southern side of the building contained concentrations of arsenic and lead above the adopted human health criteria.

7.2.5.2 HYDROCARBONS

Two samples (B4 and B5) contained TPH carbon ranges C_{10} – C_{14} (sample B4 only) and C_{15} – C_{36} concentrations above laboratory LOR and therefore above the Wellington Region background concentrations. A Wellington Region has a background concentration for TPH carbon range C_7 – C_{36} of 260 mg/kg, the detected TPH C_7 – C_{36} detected in samples B4 and B5 were above the adopted background concentration. Sample B5 was collected outside of the shed entranceway

All samples analysed contained concentrations of PAHs below laboratory LOR and therefore below the Wellington Region background concentrations.

7.2.5.3 PESTICIDES

Sample B1 collected adjacent to the west of the buildings contained concentrations of at least one or more OCP analytes above laboratory LOR. All concentrations were below the adopted human health criteria.

Sample B1 contained concentrations of OPP and acid herbicides below laboratory LOR and therefore below the adopted human health criteria.

7.2.5.4 ASBESTOS

Asbestos was detected in two samples (B1 and B2) above laboratory LOR. These concentrations exceed the adopted soil guideline values (SGV) for asbestos – residential. Additionally, two samples (B3 and B4) contained concentrations of asbestos below the laboratory limit of report and therefore below the adopted SGV for asbestos – residential. No asbestos was detected in sample B5.

7.2.6 SOUTH-EAST CORNER OF THE SITE

7.2.6.1 HEAVY METALS

All samples collected from former rubbish piles contained at least one or more heavy metal analytes above laboratory limit of reporting (LOR) and adopted background concentrations.

One sample (R5) collected in the centre of this area contained concentrations of lead above the adopted human health criteria.

7.2.6.2 HYDROCARBONS

Two samples (R3 and R5) contained TPH concentrations above laboratory LOR. Concentrations of TPH (C_7 – C_{36}) in sample R5 were above the Wellington Region background concentrations. TPH concentrations in all samples were below the adopted human health criteria.

Samples R3 and R5 contained concentrations of one or more PAH analytes above laboratory LOR. All samples contained concentrations of PAHs below the adopted background concentrations and human health criteria.

7.2.6.3 PESTICIDES

With the exception of sample R4, all samples contained concentrations of at least one or more OCP analytes above laboratory LOR and therefore Wellington Region background concentrations. All concentrations were below the adopted human health criteria.

All samples contained concentrations of OPP and acid herbicides below laboratory LOR and therefore below the adopted human health criteria.

7.2.6.4 ASBESTOS

No asbestos was detected in any of the samples analysed.

8 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) (Table 8-1) was developed to inform the investigation and to describe the relationship between sources of contamination on site, the human and environmental receptors that may be exposed to those contaminants in the context of residential use of the investigation area, and the pathways by which those receptors may be exposed.

Table 8-1: Conceptual Site Model

CONTAMINANT SOURCE	RECEPTOR	PATHWAY	COMPLETENESS OF PATHWAY
Building materials in a deteriorated condition Contaminants of concern: — Asbestos Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could pose a risk to human health or the environment. Contaminants of concern: — Heavy metals – arsenic and lead	Construction workers	Exposure of workers to contaminants in soils and groundwater during site redevelopment – dermal contact, and/or ingestion or inhalation of dust/vapours.	Complete Pathway – in situ buildings Asbestos have been identified at concentrations which present a potential risk to human health. This pathway can be managed via implementation of appropriate controls.
	Future site users	Exposure of future site users to contaminants in soils – dermal contact, ingestion or inhalation of dust/vapours.	Complete Pathway – in situ buildings Asbestos, arsenic and lead have been identified at concentrations which present a potential unacceptable risk to human health. This pathway can be managed via implementation of appropriate controls If asbestos, arsenic and lead is left in situ, long term management will be required, and the pathway is considered potentially complete for this reason. The risk can be managed with a long-term management plan.
	General public	Exposure of general public to contaminants in soils–inhalation of dust	Incomplete Pathway – in situ buildings The site is private property and is not currently freely accessible to the public.
	Groundwater resources for public consumption	Leaching and migration of soil contaminants into groundwater	Incomplete Pathway – in situ buildings No bores on site or within a 50m radius of the site are used for public consumption.

9 CONCLUSION AND RECOMMENDATIONS

9.1 CONCLUSIONS

Three HAIL activities were identified to apply to the site following the completion of a desktop review:

- A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
- E1: Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition
- I: Any other land that has been the subject to intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment

The soil sampling undertaken as part of this investigation confirms the following:

- The soils across the site contain analytes at concentrations that exceed Wellington Regional background concentrations.
- The soils around the buildings and in the south east corner of the site contain concentrations of asbestos, arsenic and lead that exceeds human health guidelines.
- One sample from the sediment within the drain contained arsenic slightly above human health criteria.

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9.2 RECOMMENDATIONS

Given the presence of contaminants of concern above Wellington Regional background concentrations and/or human health criteria, WSP recommend the following further works:

- If the land is to be developed into a residential landuse a resource consent will be required under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
- The consent will require a remediation action plan (RAP) and a Site Management Plan (SMP) to be prepared.
- Any soil disturbance around the buildings will need to be undertaken as “asbestos related work”.
- If impacted soils are to remain on site after development/remediation a long-term management plan will be required to ensure remaining soil contamination is managed appropriately to limit exposure to site occupies or users.

10 REFERENCES

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LIMITATIONS

SCOPE OF SERVICES

This report ('Report') has been prepared by WSP exclusively for Kapiti Coast District Council ('Client') in relation to soil contamination at 254 Rangiuru Road, Otaki ('Purpose') and in accordance with the Short form Agreement with the Client dated 1 April 2021 and WSP proposal "254 Rangiuru Road, Otaki: Preliminary and Detailed Site Investigation" dated 31 March 2021. The findings in this Report are based on and are subject to the assumptions specified in the Report and WSP proposal "254 Rangiuru Road, Otaki: Preliminary and Detailed Site Investigation" dated 31 March 2021. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

This Report has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

In preparing the report, WSP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

ENVIRONMENTAL CONCLUSIONS

In accordance with the scope of services, WSP has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted

practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

WSP will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Appendix A

Figures

Figure 1 - Site Location and Layout Plan

254 Rangiuru Rd, Otaki
KCDC Rangiuru Rd Due Diligence

Geospatial
Level 3, 100 Beaumont St, Auckland 1010 | Tel (09) 355 9500

LINZ, Stats NZ, Eagle Technology, Esri, HERE, Garmin, METI/NASA, USGS, Esri Community Maps Contributors, LINZ, Stats NZ, Eagle Technology, Esri, HERE, Garmin, METI/NASA, USGS, Maxar

Project Number:	Author:	Client:
3-AK085.00	JP	Kāpiti Coast District Council
Date:	**Approved by:**	
27/04/2021	HJ	

Figure 2 - Sample Location Plan

254 Rangiuru Rd, Otaki
KCDC Rangiuru Rd Due Diligence

Project Number:	Author:	Client:
3-AK085.00	JP	Kāpiti Coast District Council
Date: 27/04/2021	Approved by: HJ	

WSP Geospatial
Level 3, 100 Beaumont St, Auckland 1010 | Tel (09) 355 9500

Kapiti Coast DC, LINZ, Esri Community Maps Contributors, LINZ, Stats NZ, Eagle Technology, Esri, HERE, Garmin, METI/NASA, USGS

Appendix B

Historical Aerial Photographs

Legend:

Approximate Site Boundary

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

Legend:

Approximate Site Boundary

Legend:

Approximate Site Boundary

Legend:

Approximate Site Boundary

Legend:

Approximate Site Boundary

254 Rangiuru Road, Otaki - 1998

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2001

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2007

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2010

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2013

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2017

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

254 Rangiuru Road, Otaki - 2021

Kāpiti Coast DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Key to map symbols

Approximate Site Boundary

N

0 25 50 Metres

1:1,128

Date Printed: April 7, 2021

Appendix C

Photolog

Photo 1: Looking west at the house and garage from the south-east boundary of the site

Photo 2: Looking north from the south-east corner of the site at the previous location of Glass House 2

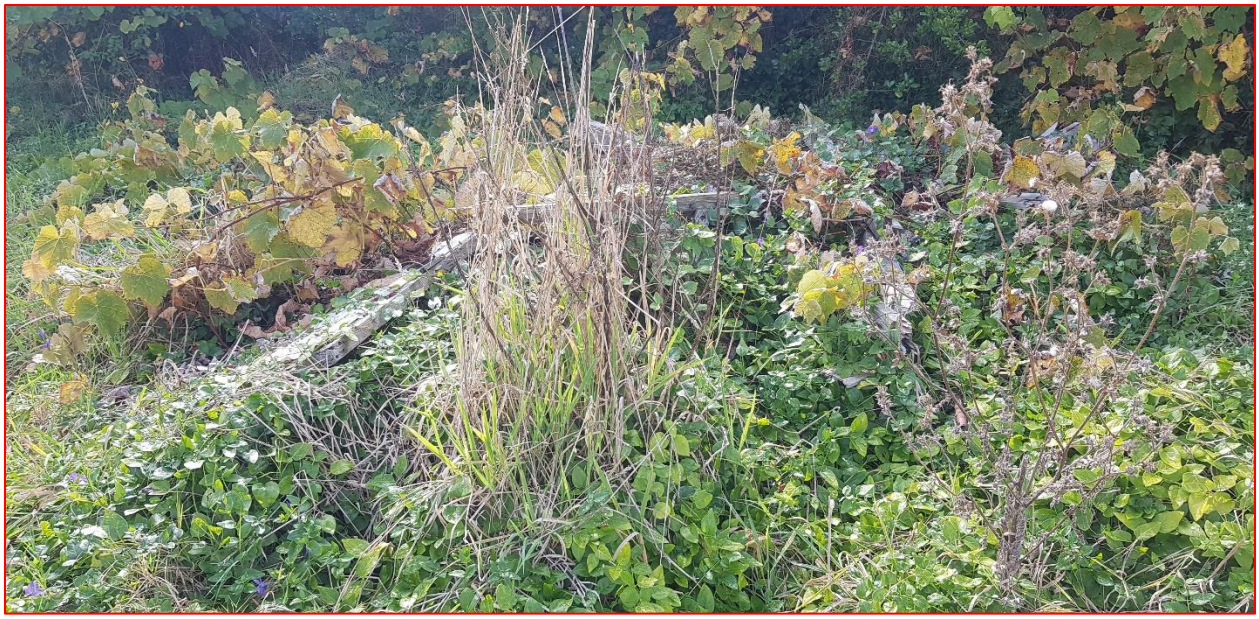

Photo 3: Building rubble (wood) obscured by weeds in the south-east corner of the site

Photo 4: Black plastic partially buried by weeds in the previous location of Glass House 2

Photo 5: Looking south at the northern side of the shed and house from the centre of the site

Photo 6: Looking south at the north side of the shed and the previous location of Glass House 1

Photo 7: Looking north-east across the horticultural area from the centre of the site

Photo 8: Looking north-west at the drainage ditch

Photo 9: Pipes and plastic in the central area of the drainage ditch

Photo 10: Looking at the southern and eastern walls of the house

Photo 11: Corroded metal drum on the south side of the house

Photo 12: Damaged asbestos containing fibre cement sheet external wall cladding

Photo 13: Collapsed section of the shed

Photo 14: Looking through the back wall of the garage at the corroded metal drums in the lean-to

Photo 15: Looking through the back wall of the garage at the corroded metal drums in the lean-to

Photo 16: Looking into the garage from the south side door

Photo 17: Stored items on the east side of the garage

Photo 18: Stored items on the east side of the garage

Photo 19: Stored items on the east side of the garage

Photo 20: Stored items on the east side of the garage

Photo 21: East side of the garage heavily overgrown with weeds

Photo 22: Looking across the heavily overgrown south-east corner of the site towards the house

Photo 23: Rubble in the south-east corner of the site overgrown with weeds

Photo 24: Rubble in the south-east corner of the site overgrown with weeds

Appendix D

Laboratory Certificates of Analysis

CHAIN OF CUSTODY RECORD - NEW ZEALAND

Eurofins Environment Testing New Zealand NZBN 9429 04602 4954

☑ **Auckland Laboratory**
35 O'Rorke Road Penrose Auckland 1061 NZ
0800 856450 (free dial) EnviroSampleAKL@eurofins.com

☐ **Wellington Office**
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☐ **Christchurch Laboratory**
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☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh VIC 3166 AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP NZ Ltd	Project №	3-AK085.00	Project Manager	
Address	L9 Magestic Centre 100 Willis St, Wellington	Project Name		EDD Format	
Contact Name	Hannah Juchnowicz			Sampler(s)	Hannah Juchnowicz
Phone №	027 215 4102			Handed over by	Courier
Special Directions				Email for Invoice	hannah.juchnowicz@wsp.com
Purchase Order	3-AK085.00			Email for Results	hannah.juchnowicz@wsp.com
Quote ID №					

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

Containers — Change container type & size if necessary.

Required Turnaround Time — Default will be 5 days if not ticked. ♦Surcharge will apply

- ☐ 1 day♦
- ☐ 2 days♦
- ☑ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Lead	Heavy metals + Hg	Acid herbicides screen	Organophosphates screen	Organochlorines screen	TPH Suite	PAH Suite	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	500mL PFAS PET	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	C1-1	08/04/21 00:00	S		✓	✓	✓	✓									1	Composite C1-1, C1-2 & C1-3
2	C1-2	08/04/21 00:00	S		✓	✓	✓	✓									1	
3	C1-3	08/04/21 00:00	S		✓	✓	✓	✓									1	
4	C2-1	08/04/21 00:00	S		✓	✓	✓	✓									1	Composite C2-1, C2-2, & C2-3
5	C2-2	08/04/21 00:00	S		✓	✓	✓	✓									1	
6	C2-3	08/04/21 00:00	S		✓	✓	✓	✓									1	
7	C2-4	08/04/21 00:00	S		✓	✓	✓	✓									1	
8	D1	08/04/21 00:00	S		✓	✓	✓	✓									1	
9	D2	08/04/21 00:00	S		✓	✓	✓	✓									1	
10	D3	08/04/21 00:00	S		✓	✓	✓	✓									1	
	Total Counts																1	

Date/Time: 12/4/21 8:00AM

Chilled: Temp: 4.2 (Yes) / No

Correction: -0.1

Final Temp: 4.1

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Name: Hannah Juchnowicz Signature: Hannah J Date: 08/04/2021 Time:

Eurofins Laboratory Use Only

Received By		AKL | WLG | CHC | MEL	Signature		Date	Time	Temperature	
Received By		AKL | WLG | CHC | MEL	Signature		Date	Time	Report №	786278

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☐ Wellington Office
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0800 856450 (free dial) EnviroSampleWLG@eurofins.com

☐ Christchurch Laboratory
43 Detroit Drive Rolleston 7675 NZ
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☐ Melbourne Laboratory
2 Kingston Town Close Oakleigh VIC 3166 AU
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP NZ Ltd	Project №	3-AK085.00	Project Manager	
Address	L9 Magestic Centre 100 Willis St, Wellington	Project Name		EDD Format ESdat, EQuIS etc	
Contact Name	Hannah Juchnowicz			Sampler(s)	Hannah Juchnowicz
Phone №	027 215 4102			Handed over by	Courier
Special Directions				Email for Invoice	hannah.juchnowicz@wsp.com
Purchase Order	3-AK085.00			Email for Results	hannah.juchnowicz@wsp.com
Quote ID №					

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

Containers (Change container type & size if necessary)

Required Turnaround Time (Default will be 5 days if not ticked)

♦Surcharge will apply

☐ 1 day♦ ☐ 2 days♦ ☑ 3 days♦ ☐ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Lead	Heavy metals + Hg	Acid herbicides screen	Organophosphates screen	Organochlorine screen	TPH suite	PAH suite	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	500mL PFAS PET	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	C3-1	08/04/21 00:00	S		✓	✓	✓	✓									1	Composite of C3-1, C3-2, C3-3 & C3-4
2	C3-2	08/04/21 00:00	S		✓	✓	✓	✓									1	
3	C3-3	08/04/21 00:00	S		✓	✓	✓	✓									1	
4	C3-4	08/04/21 00:00	S		✓	✓	✓	✓									1	
5	C3-5	08/04/21 00:00	S		✓	✓	✓	✓									1	
6	C4-1	08/04/21 00:00	S		✓	✓	✓	✓									1	
7	C4-2	08/04/21 00:00	S		✓	✓	✓	✓									1	Composite of C4-2, C4-3, C4-4 C4-5
8	C4-3	08/04/21 00:00	S		✓	✓	✓	✓									1	
9	C4-4	08/04/21 00:00	S		✓	✓	✓	✓									1	
10	C4-5	08/04/21 00:00	S		✓	✓	✓	✓									1	
	Total Counts																	

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Hannah Juchnowicz	Signature	Hannah
				Date	08/04/2021	Time	

Eurofins Laboratory Use Only	Received By		AKL | WLG | CHC | MEL	Signature		Date	
	Received By		AKL | WLG | CHC | MEL	Signature		Date	

Time		Temperature	
Time		Report №	

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Company	WSP NZ Ltd	Project №	3-AK085.00
Address	L9 Magestic Centre 100 Willis St, Wellington	Project Name	
Contact Name	Hannah Juchnowicz	Project Manager	
Phone №	027 215 4102	EDD Format (ESdat, EQuIS etc)	
Special Directions		Sampler(s)	Hannah Juchnowicz
Purchase Order	3-AK085.00	Handed over by	Courier
Quote ID №		Email for Invoice	hannah.juchnowicz@wsp.com
		Email for Results	hannah.juchnowicz@wsp.com

Analyses — Where metals are required, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Lead #	Heavy metals + Hg	Acid herbicides screen	Organophosphates screen	Organochlorines screen	TPH suite	PAH suite	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	500mL PFAS PET	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	T-1	09/04/21 00:00	S		✓	✓	✓	✓									1	composite of T-1, T-2 & T-3
2	T-2	09/04/21 00:00	S		✓	✓	✓	✓									1	
3	T-3	09/04/21 00:00	S		✓	✓	✓	✓									1	
4	G1-1	09/04/21 00:00	S		✓	✓	✓	✓									1	composite of G1-1 & G1-2
5	G1-2	09/04/21 00:00	S		✓	✓	✓	✓									1	
6	G2	09/04/21 00:00	S		✓	✓	✓	✓									1	
7	R1	09/04/21 00:00	S		✓	✓	✓	✓	✓	✓							1	
8	R2	09/04/21 00:00	S		✓	✓	✓	✓	✓	✓							1	
9	R3	09/04/21 00:00	S		✓	✓	✓	✓	✓	✓							1	
10	R4	09/04/21 00:00	S		✓	✓	✓	✓	✓	✓							1	
	Total Counts																	

Containers — Change container type & size if necessary

Required Turnaround Time — Default will be 5 days if not ticked. ♦Surcharge will apply

- ☐ 1 day♦
- ☐ 2 days♦
- ☑ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Hannah Juchnowicz	Signature		Date	08/04/2021	Time	
Eurofins Laboratory Use Only	Received By		AKL | WLG | CHC | MEL	Signature				Date		Time		Temperature	4.2
	Received By		AKL | WLG | CHC | MEL	Signature				Date		Time		Report №	

CHAIN OF CUSTODY RECORD - NEW ZEALAND

Eurofins Environment Testing New Zealand NZBN 9429 04602 4954

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Company	WSP NZ Ltd	Project №	3-AK085.00
Address	L9 Magestic Centre 100 Willis St, Wellington	Project Name	
Contact Name	Hannah Juchnowicz	Project Manager	
Phone №	027 215 4102	EDD Format (ESdat, EQuIS etc)	
Special Directions		Sampler(s)	Hannah Juchnowicz
Purchase Order	3-AK085.00	Handed over by	Courier
Quote ID №		Email for Invoice	hannah.juchnowicz@wsp.com
		Email for Results	hannah.juchnowicz@wsp.com

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

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1	R5	09/04/21 00:00	S		✓	✓	✓	✓	✓	✓							1	
2	B1	09/04/21 00:00	S	✓													1	
3	B2	09/04/21 00:00	S	✓													1	
4	B3	09/04/21 00:00	S	✓													1	
5	B4	09/04/21 00:00	S		✓				✓	✓							1	
6	B5	09/04/21 00:00	S		✓				✓	✓							1	
7	B6	09/04/21 00:00	S															
8																		
9																		
10																		
		Total Counts																

Containers — Change container type & size if necessary

Required Turnaround Time — Default will be 5 days if not ticked

♦Surcharge will apply

- ☐ 1 day♦
- ☐ 2 days♦
- ☑ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Hannah Juchnowicz	Signature	Hannah J
						Date	09/04/2021
						Time	
						Temperature	
Eurofins Laboratory Use Only	Received By		AKL | WLG | CHC | MEL	Signature		Date	
						Time	
	Received By		AKL | WLG | CHC | MEL	Signature		Date	
						Time	
						Report №	

CHAIN OF CUSTODY RECORD - NEW ZEALAND

Eurofins Environment Testing New Zealand NZBN 9429 04602 4954

- [ ] **Auckland Laboratory** 35 O'Rorke Road Penrose Auckland 1061 NZ 0800 856450 (free dial) EnviroSampleAKL@eurofins.com
- [ ] **Wellington Office** 85 Port Road Seaview Lower Hutt 5011 NZ 0800 856450 (free dial) EnviroSampleWLG@eurofins.com
- [x] **Christchurch Laboratory** 43 Detroit Drive Rolleston 7675 NZ 0800 856450 (free dial) EnviroSampleCHC@eurofins.com
- [ ] **Melbourne Laboratory** 2 Kingston Town Close Oakleigh VIC 3166 AU +61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP NZ Ltd	Project №	3-AK085.00	Project Manager	
Address	L9 Majestic Centre 100 Willis Street, Wellington	Project Name		EDD Format (ESdat, EQuIS etc)	
Contact Name	Hannah Juchnowicz			Sampler(s)	Hannah Juchnowicz
Phone №	027 215 4102			Handed over by	Courier
Special Directions				Email for Invoice	hannah.juchnowicz@wsp.com
Purchase Order	3-AK085.00			Email for Results	hannah.juchnowicz@wsp.com
Quote ID №					

Analyses: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

Containers: Change container type & size if necessary.

Required Turnaround Time: Default will be 5 days if not ticked. ♦Surcharge will apply
- [ ] 1 day♦
- [ ] 2 days♦
- [x] 3 days♦
- [ ] 5 days (Standard)
- [ ] Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Asbestos semi quantitative	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	500mL PFAS PET	Jar (Glass or HDPE)	Ziploc bag	Sample Comments / Dangerous Goods Hazard Warning
1	R1 ✓	09/04/21 00:00	S	1	1								
2	R2 ✓	09/04/21 00:00	S	1	1								
3	R3 ✓	09/04/21 00:00	S	1	1								
4	R4 ✓	09/04/21 00:00	S	1	1								
5	R5 ✓	09/04/21 00:00	S	1	1								
6	B1 ✓	09/04/21 00:00	S	1	1								
7	B2 ✓	09/04/21 00:00	S	1	1								
8	B3 ✓	09/04/21 00:00	S	1	1								
9	B4 ✓	09/04/21 00:00	S	1	1								
10	B5 ✓	09/04/21 00:00	S	1	1								
				1	1								

Date/Time: 14/4/21 / 09:14
Chilled: (Yes) / No
Temp: 15.4
Correction: 0.2
Final Temp: 15.6

Method of Shipment	[x] Courier (#)	[ ] Hand Delivered	[ ] Postal	Name	Hannah Juchnowicz	Signature	[signature]	Date	09/04/2021	Time	
Eurofins Laboratory Use Only	Received By	[signature]	AKL | WLG | (CHC) | MEL	Signature	[signature]	Date	14/4/21	Time	09:14	Temperature	15.6
	Received By		AKL | WLG | CHC | MEL	Signature		Date		Time		Report №	

 QS3106_R6 Modified by: S. Kirjima Approved by: Dr. R. Symons on: 13 June 2018

WSP New Zealand Limited
Level 9 Majestic Centre, 100 Willis Street
Wellington
New Zealand 6144

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Attention: **Hannah Juchnowicz**

Report **786278-S**
Project name
Project ID 3-AK085.00
Received Date Apr 12, 2021

Client Sample ID			**COMP C1**	**COMP C2**	**COMP C3**	**COMP C4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K21-Ap14490**	**K21-Ap14491**	**K21-Ap14492**	**K21-Ap14493**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Naled[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Phorate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)[N16]	1	%	113	117	111	119

Client Sample ID			COMP C1	COMP C2	COMP C3	COMP C4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14490	K21-Ap14491	K21-Ap14492	K21-Ap14493
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)[N16]	0.5	%	101	107	109	112
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.01	0.01	0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.01	0.01	0.04	0.05
4.4'-DDD	0.01	mg/kg	0.01	0.01	0.02	0.02
4.4'-DDE	0.01	mg/kg	0.04	0.12	0.17	0.13
4.4'-DDT	0.01	mg/kg	0.04	0.07	0.07	0.07
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.11	0.22	0.31	0.27
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.01	0.04	0.01	0.05
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	70	90	93	78
Tetrachloro-m-xylene (surr.)	1	%	87	85	94	88
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	11	12	11	12
Cadmium	0.01	mg/kg	0.23	0.30	0.29	0.34
Chromium	0.1	mg/kg	16	18	18	20
Copper	0.1	mg/kg	48	76	78	98
Lead	0.1	mg/kg	26	34	31	37

Client Sample ID			COMP C1	COMP C2	COMP C3	COMP C4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14490	K21-Ap14491	K21-Ap14492	K21-Ap14493
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.13	0.12	0.13	0.14
Nickel	0.1	mg/kg	14	16	16	17
Zinc	5	mg/kg	87	100	95	100
% Moisture	1	%	17	16	18	16

Client Sample ID			COMP T	COMP G1	C2-4	D1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14494	K21-Ap14495	K21-Ap14496	K21-Ap14497
Date Sampled			Not Provided[I12]	Not Provided[I12]	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Naled[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Phorate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)[N16]	1	%	108	99	70	89

Client Sample ID			COMP T	COMP G1	C2-4	D1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14494	K21-Ap14495	K21-Ap14496	K21-Ap14497
Date Sampled			Not Provided[I12]	Not Provided[I12]	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)[N16]	0.5	%	109	109	103	93
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.01	< 0.01	0.01	< 0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.04	0.01	0.04	0.02
4.4'-DDD	0.01	mg/kg	0.01	< 0.01	0.04	< 0.01
4.4'-DDE	0.01	mg/kg	0.11	0.04	0.11	0.05
4.4'-DDT	0.01	mg/kg	0.08	0.01	0.06	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.25	0.06	0.26	0.07
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	0.05	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	0.41	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	3.6	0.03	0.04	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	76	79	82	103
Tetrachloro-m-xylene (surr.)	1	%	94	85	92	93
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	12	12	11	8.8
Cadmium	0.01	mg/kg	0.35	0.23	0.28	0.66
Chromium	0.1	mg/kg	19	19	17	15
Copper	0.1	mg/kg	76	51	82	52
Lead	0.1	mg/kg	35	49	33	32

Client Sample ID			COMP T	COMP G1	C2-4	D1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14494	K21-Ap14495	K21-Ap14496	K21-Ap14497
Date Sampled			Not Provided[I12]	Not Provided[I12]	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.15	0.13	0.12	0.18
Nickel	0.1	mg/kg	16	15	15	14
Zinc	5	mg/kg	110	150	98	160
% Moisture	1	%	17	21	16	40

Client Sample ID			D2	D3	C3-5	C4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14498	K21-Ap14499	K21-Ap14500	K21-Ap14501
Date Sampled			Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Naled[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Phorate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)[N16]	1	%	78	67	68	79

Client Sample ID			D2	D3	C3-5	C4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14498	K21-Ap14499	K21-Ap14500	K21-Ap14501
Date Sampled			Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)[N16]	0.5	%	102	108	108	72
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.07	< 0.01	< 0.01	0.01
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.08	0.02	0.05	0.06
4.4'-DDD	0.01	mg/kg	0.02	< 0.01	0.02	0.04
4.4'-DDE	0.01	mg/kg	0.20	0.09	0.11	0.12
4.4'-DDT	0.01	mg/kg	0.03	0.02	0.02	0.04
DDT + DDE + DDD (Total)*	0.01	mg/kg	0.40	0.13	0.20	0.27
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	0.03	< 0.01	< 0.01	0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	106	93	77	84
Tetrachloro-m-xylene (surr.)	1	%	92	100	92	91
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	26	13	11	12
Cadmium	0.01	mg/kg	0.63	0.37	0.26	0.30
Chromium	0.1	mg/kg	42	18	18	18
Copper	0.1	mg/kg	190	83	78	93
Lead	0.1	mg/kg	73	61	31	31

Client Sample ID			D2	D3	C3-5	C4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14498	K21-Ap14499	K21-Ap14500	K21-Ap14501
Date Sampled			Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.21	0.16	0.13	0.18
Nickel	0.1	mg/kg	19	14	15	16
Zinc	5	mg/kg	460	140	94	97
% Moisture	1	%	39	18	18	17

Client Sample ID			G2	R1	R2	R3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14502	K21-Ap14503	K21-Ap14504	K21-Ap14505
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Naled[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate[N16]	2	mg/kg	< 2	< 2	< 2	< 2
Phorate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate[N16]	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)[N16]	1	%	88	87	95	81

Client Sample ID			G2	R1	R2	R3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14502	K21-Ap14503	K21-Ap14504	K21-Ap14505
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop[N16]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)[N16]	0.5	%	74	73	71	79
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	0.03	0.03	0.04	< 0.01
2.4'-DDE	0.01	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2.4'-DDT	0.01	mg/kg	0.12	0.05	0.07	< 0.01
4.4'-DDD	0.01	mg/kg	0.22	0.01	0.03	< 0.01
4.4'-DDE	0.01	mg/kg	0.16	0.08	0.10	0.01
4.4'-DDT	0.01	mg/kg	0.57	0.01	0.04	< 0.01
DDT + DDE + DDD (Total)*	0.01	mg/kg	1.1	0.18	0.28	0.01
a-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
b-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
d-BHC	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	0.01	mg/kg	0.03	< 0.01	< 0.01	< 0.01
Endosulfan II	0.01	mg/kg	0.09	< 0.01	0.01	< 0.01
Endosulfan sulphate	0.01	mg/kg	1.4	0.03	0.23	< 0.01
Endrin	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	98	97	100	119
Tetrachloro-m-xylene (surr.)	1	%	97	96	89	93
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	13	15	16	9.8
Cadmium	0.01	mg/kg	0.27	0.35	0.42	0.68
Chromium	0.1	mg/kg	17	19	17	22
Copper	0.1	mg/kg	110	77	170	38
Lead	0.1	mg/kg	120	76	78	150

Client Sample ID			G2	R1	R2	R3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14502	K21-Ap14503	K21-Ap14504	K21-Ap14505
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Metals M8 (NZ MfE)						
Mercury	0.01	mg/kg	0.18	0.16	0.16	0.23
Nickel	0.1	mg/kg	12	15	14	15
Zinc	5	mg/kg	150	170	220	280
% Moisture	1	%	24	22	23	31
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	-	< 5	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	< 10	< 10	< 10
TPH-SG C15-C36	20	mg/kg	-	< 20	< 20	50
TPH-SG C7-C36 (Total)	35	mg/kg	-	< 35	< 35	51
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	0.08	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Chrysene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Fluorene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	-	< 0.03	< 0.03	0.12
Pyrene	0.03	mg/kg	-	< 0.03	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	-	87	75	91
2-Fluorobiphenyl (surr.)	1	%	-	65	68	75

Client Sample ID			R4	R5	B1	B2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14506	K21-Ap14507	K21-Ap14508	K21-Ap14509
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos[N16]	2	mg/kg	< 2	< 2	-	-
Demeton-S[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID			R4	R5	B1	B2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14506	K21-Ap14507	K21-Ap14508	K21-Ap14509
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dichlorvos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethoprop[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Methyl parathion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos[N16]	2	mg/kg	< 2	< 2	-	-
Naled[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate[N16]	2	mg/kg	< 2	< 2	-	-
Phorate[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate[N16]	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)[N16]	1	%	85	98	-	-
Acid Herbicides						
2.4-D[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-DB[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-T[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-TP[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Actril (loxynil)[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Dicamba[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Dichlorprop[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Dinitro-o-cresol[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Dinoseb[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
MCPA[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
MCPB[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Mecoprop[N16]	0.5	mg/kg	< 0.5	< 0.5	-	-
Warfarin (surr.)[N16]	0.5	%	73	118	-	-
Organochlorine Pesticides (NZ MfE)						
2.4'-DDD	0.01	mg/kg	< 0.01	0.01	-	-
2.4'-DDE	0.01	mg/kg	< 0.01	< 0.01	-	-
2.4'-DDT	0.01	mg/kg	< 0.01	0.03	-	-
4.4'-DDD	0.01	mg/kg	< 0.01	0.01	-	-
4.4'-DDE	0.01	mg/kg	< 0.01	0.03	-	-
4.4'-DDT	0.01	mg/kg	< 0.01	0.01	-	-
DDT + DDE + DDD (Total)*	0.01	mg/kg	< 0.01	0.09	-	-
a-BHC	0.01	mg/kg	< 0.01	< 0.01	-	-

Client Sample ID			R4	R5	B1	B2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14506	K21-Ap14507	K21-Ap14508	K21-Ap14509
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Organochlorine Pesticides (NZ MfE)						
Aldrin	0.01	mg/kg	< 0.01	< 0.01	-	-
b-BHC	0.01	mg/kg	< 0.01	< 0.01	-	-
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01	-	-
cis-Chlordane	0.01	mg/kg	< 0.01	< 0.01	-	-
d-BHC	0.01	mg/kg	< 0.01	< 0.01	-	-
Dieldrin	0.01	mg/kg	< 0.01	< 0.01	-	-
Endosulfan I	0.01	mg/kg	< 0.01	< 0.01	-	-
Endosulfan II	0.01	mg/kg	< 0.01	0.03	-	-
Endosulfan sulphate	0.01	mg/kg	< 0.01	0.04	-	-
Endrin	0.01	mg/kg	< 0.01	< 0.01	-	-
Endrin aldehyde	0.01	mg/kg	< 0.01	< 0.01	-	-
Endrin ketone	0.01	mg/kg	< 0.01	< 0.01	-	-
g-BHC (Lindane)	0.01	mg/kg	< 0.01	< 0.01	-	-
Heptachlor	0.01	mg/kg	< 0.01	< 0.01	-	-
Heptachlor epoxide	0.01	mg/kg	< 0.01	< 0.01	-	-
Hexachlorobenzene	0.01	mg/kg	< 0.01	< 0.01	-	-
Methoxychlor	0.01	mg/kg	< 0.01	< 0.01	-	-
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	-	-
trans-Chlordane	0.01	mg/kg	< 0.01	< 0.01	-	-
Dibutylchlorendate (surr.)	1	%	113	INT	-	-
Tetrachloro-m-xylene (surr.)	1	%	96	93	-	-
Metals M8 (NZ MfE)						
Arsenic	0.1	mg/kg	8.7	12	-	-
Cadmium	0.01	mg/kg	0.14	1.1	-	-
Chromium	0.1	mg/kg	15	24	-	-
Copper	0.1	mg/kg	17	300	-	-
Lead	0.1	mg/kg	42	260	-	-
Mercury	0.01	mg/kg	0.11	0.15	-	-
Nickel	0.1	mg/kg	12	15	-	-
Zinc	5	mg/kg	100	510	-	-
Lead	0.1	mg/kg	-	-	100	210
% Moisture	1	%	21	30	28	40
Total Petroleum Hydrocarbons (NZ MfE 1999)						
TPH-SG C7-C9	5	mg/kg	< 5	< 5	-	-
TPH-SG C10-C14	10	mg/kg	< 10	< 10	-	-
TPH-SG C15-C36	20	mg/kg	< 20	470	-	-
TPH-SG C7-C36 (Total)	35	mg/kg	< 35	470	-	-
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Acenaphthene	0.03	mg/kg	< 0.03	< 0.03	-	-
Acenaphthylene	0.03	mg/kg	< 0.03	< 0.03	-	-
Anthracene	0.03	mg/kg	< 0.03	< 0.03	-	-
Benz(a)anthracene	0.03	mg/kg	< 0.03	< 0.03	-	-
Benzo(a)pyrene	0.03	mg/kg	< 0.03	< 0.03	-	-
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	< 0.03	< 0.03	-	-
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	0.04	0.04	-	-
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	0.08	0.07	-	-
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	< 0.03	< 0.03	-	-
Benzo(g.h.i)perylene	0.03	mg/kg	< 0.03	< 0.03	-	-

Client Sample ID			R4	R5	B1	B2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14506	K21-Ap14507	K21-Ap14508	K21-Ap14509
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (NZ MfE)						
Benzo(k)fluoranthene	0.03	mg/kg	< 0.03	< 0.03	-	-
Chrysene	0.03	mg/kg	< 0.03	0.04	-	-
Dibenz(a.h)anthracene	0.03	mg/kg	< 0.03	< 0.03	-	-
Fluoranthene	0.03	mg/kg	< 0.03	0.06	-	-
Fluorene	0.03	mg/kg	< 0.03	< 0.03	-	-
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	< 0.03	< 0.03	-	-
Naphthalene	0.1	mg/kg	< 0.1	< 0.1	-	-
Phenanthrene	0.03	mg/kg	< 0.03	0.06	-	-
Pyrene	0.03	mg/kg	< 0.03	0.07	-	-
p-Terphenyl-d14 (surr.)	1	%	86	77	-	-
2-Fluorobiphenyl (surr.)	1	%	66	69	-	-

Client Sample ID			B3	B4	B5
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14510	K21-Ap14511	K21-Ap14512
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit			
Metals M8 (NZ MfE)					
Arsenic	0.1	mg/kg	-	37	14
Cadmium	0.01	mg/kg	-	1.3	0.43
Chromium	0.1	mg/kg	-	23	21
Copper	0.1	mg/kg	-	48	97
Lead	0.1	mg/kg	-	220	50
Mercury	0.01	mg/kg	-	0.17	0.16
Nickel	0.1	mg/kg	-	20	17
Zinc	5	mg/kg	-	940	190
Lead	0.1	mg/kg	65	-	-
% Moisture	1	%	20	29	16
Total Petroleum Hydrocarbons (NZ MfE 1999)					
TPH-SG C7-C9	5	mg/kg	-	< 5	< 5
TPH-SG C10-C14	10	mg/kg	-	10	< 10
TPH-SG C15-C36	20	mg/kg	-	580	230
TPH-SG C7-C36 (Total)	35	mg/kg	-	590	230
Polycyclic Aromatic Hydrocarbons (NZ MfE)					
Acenaphthene	0.03	mg/kg	-	< 0.03	< 0.03
Acenaphthylene	0.03	mg/kg	-	< 0.03	< 0.03
Anthracene	0.03	mg/kg	-	< 0.03	< 0.03
Benz(a)anthracene	0.03	mg/kg	-	< 0.03	< 0.03
Benzo(a)pyrene	0.03	mg/kg	-	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)*	0.03	mg/kg	-	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)*	0.03	mg/kg	-	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)*	0.03	mg/kg	-	0.08	0.08
Benzo(b&j)fluoranthene[N07]	0.03	mg/kg	-	< 0.03	< 0.03
Benzo(g.h.i)perylene	0.03	mg/kg	-	< 0.03	< 0.03
Benzo(k)fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03
Chrysene	0.03	mg/kg	-	< 0.03	< 0.03
Dibenz(a.h)anthracene	0.03	mg/kg	-	< 0.03	< 0.03

Client Sample ID			B3	B4	B5
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			K21-Ap14510	K21-Ap14511	K21-Ap14512
Date Sampled			Apr 09, 2021	Apr 09, 2021	Apr 09, 2021
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons (NZ MfE)					
Fluoranthene	0.03	mg/kg	-	< 0.03	< 0.03
Fluorene	0.03	mg/kg	-	< 0.03	< 0.03
Indeno(1.2.3-cd)pyrene	0.03	mg/kg	-	< 0.03	< 0.03
Naphthalene	0.1	mg/kg	-	< 0.1	< 0.1
Phenanthrene	0.03	mg/kg	-	< 0.03	< 0.03
Pyrene	0.03	mg/kg	-	< 0.03	< 0.03
p-Terphenyl-d14 (surr.)	1	%	-	90	89
2-Fluorobiphenyl (surr.)	1	%	-	66	66

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organophosphorus Pesticides	Melbourne	Apr 14, 2021	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)			
Acid Herbicides	Melbourne	Apr 14, 2021	14 Days
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Organochlorine Pesticides (NZ MfE)	Auckland	Apr 12, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water by GCMSMS			
Metals M8 (NZ MfE)	Auckland	Apr 12, 2021	6 Months
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Petroleum Hydrocarbons (NZ MfE 1999)	Auckland	Apr 12, 2021	14 Days
- Method: LTM-ORG-2010 TRH and BTEX in Soil and Water by GC FID and PT GCMS			
Polycyclic Aromatic Hydrocarbons (NZ MfE)	Auckland	Apr 12, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water by GC MSMS			
% Moisture	Auckland	Apr 12, 2021	14 Days
- Method: LTM-GEN-7080 Moisture Content in Soil by Gravimetry			

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Company Name: WSP New Zealand Limited
Address: Level 9 Majestic Centre, 100 Willis Street
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Project Name:
Project ID: 3-AK085.00

Order No.: 3-AK085.00
Report #: 786278
Phone: 0011 64 4 471 7160
Fax:

Received: Apr 12, 2021 8:00 AM
Due: Apr 16, 2021
Priority: 3 Day
Contact Name: Hannah Juchnowicz

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						HOLD	Lead	Organophosphorus Pesticides	Acid Herbicides	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X			X	X	X	X	X
Christchurch Laboratory - IANZ# 1290														
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X					
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	COMP C1	Not Provided		Soil	K21-Ap14490			X	X	X		X	X	
2	COMP C2	Not Provided		Soil	K21-Ap14491			X	X	X		X	X	
3	COMP C3	Not Provided		Soil	K21-Ap14492			X	X	X		X	X	
4	COMP C4	Not Provided		Soil	K21-Ap14493			X	X	X		X	X	
5	COMP T	Not Provided		Soil	K21-Ap14494			X	X	X		X	X	
6	COMP G1	Not Provided		Soil	K21-Ap14495			X	X	X		X	X	
7	C2-4	Apr 08, 2021		Soil	K21-Ap14496			X	X	X		X	X	
8	D1	Apr 08, 2021		Soil	K21-Ap14497			X	X	X		X	X	
9	D2	Apr 08, 2021		Soil	K21-Ap14498			X	X	X		X	X	
10	D3	Apr 08, 2021		Soil	K21-Ap14499			X	X	X		X	X	
11	C3-5	Apr 08, 2021		Soil	K21-Ap14500			X	X	X		X	X	

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Sample Detail						HOLD	Lead	Organophosphorus Pesticides	Acid Herbicides	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X			X	X	X	X	X
Christchurch Laboratory - IANZ# 1290														
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X					
External Laboratory														
12	C4-1	Apr 08, 2021		Soil	K21-Ap14501			X	X	X		X	X	
13	G2	Apr 09, 2021		Soil	K21-Ap14502			X	X	X		X	X	
14	R1	Apr 09, 2021		Soil	K21-Ap14503			X	X	X	X	X	X	X
15	R2	Apr 09, 2021		Soil	K21-Ap14504			X	X	X	X	X	X	X
16	R3	Apr 09, 2021		Soil	K21-Ap14505			X	X	X	X	X	X	X
17	R4	Apr 09, 2021		Soil	K21-Ap14506			X	X	X	X	X	X	X
18	R5	Apr 09, 2021		Soil	K21-Ap14507			X	X	X	X	X	X	X
19	B1	Apr 09, 2021		Soil	K21-Ap14508		X			X				
20	B2	Apr 09, 2021		Soil	K21-Ap14509		X			X				
21	B3	Apr 09, 2021		Soil	K21-Ap14510		X			X				
22	B4	Apr 09, 2021		Soil	K21-Ap14511					X	X		X	X
23	B5	Apr 09, 2021		Soil	K21-Ap14512					X	X		X	X
24	C1-1	Apr 08, 2021		Soil	K21-Ap14513	X								

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Sample Detail						HOLD	Lead	Organophosphorus Pesticides	Acid Herbicides	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X			X	X	X	X	X
Christchurch Laboratory - IANZ# 1290														
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X					
External Laboratory														
25	C1-2	Apr 08, 2021		Soil	K21-Ap14514	X								
26	C1-3	Apr 08, 2021		Soil	K21-Ap14515	X								
27	C2-1	Apr 08, 2021		Soil	K21-Ap14516	X								
28	C2-2	Apr 08, 2021		Soil	K21-Ap14517	X								
29	C2-3	Apr 08, 2021		Soil	K21-Ap14518	X								
30	C3-1	Apr 08, 2021		Soil	K21-Ap14519	X								
31	C3-2	Apr 08, 2021		Soil	K21-Ap14520	X								
32	C3-3	Apr 08, 2021		Soil	K21-Ap14521	X								
33	C3-4	Apr 08, 2021		Soil	K21-Ap14522	X								
34	C4-2	Apr 08, 2021		Soil	K21-Ap14524	X								
35	C4-3	Apr 08, 2021		Soil	K21-Ap14525	X								
36	C4-4	Apr 08, 2021		Soil	K21-Ap14526	X								
37	C4-5	Apr 08, 2021		Soil	K21-Ap14527	X								

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Project Name:
Project ID: 3-AK085.00

Order No.: 3-AK085.00
Report #: 786278
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Received: Apr 12, 2021 8:00 AM
Due: Apr 16, 2021
Priority: 3 Day
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Sample Detail						HOLD	Lead	Organophosphorus Pesticides	Acid Herbicides	Moisture Set	Total Petroleum Hydrocarbons (NZ MfE 1999)	Organochlorine Pesticides (NZ MfE)	Metals M8 (NZ MfE)	Polycyclic Aromatic Hydrocarbons (NZ MfE)
Auckland Laboratory - IANZ# 1327						X	X			X	X	X	X	X
Christchurch Laboratory - IANZ# 1290														
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X					
External Laboratory														
38	T-1	Apr 09, 2021		Soil	K21-Ap14528	X								
39	T-2	Apr 09, 2021		Soil	K21-Ap14529	X								
40	T-3	Apr 09, 2021		Soil	K21-Ap14530	X								
41	G1-1	Apr 09, 2021		Soil	K21-Ap14531	X								
42	G1-2	Apr 09, 2021		Soil	K21-Ap14532	X								
Test Counts						19	3	18	18	23	7	18	20	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides (NZ MfE)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4'-DDD	mg/kg	< 0.01			0.01	Pass	
2.4'-DDE	mg/kg	< 0.01			0.01	Pass	
2.4'-DDT	mg/kg	< 0.01			0.01	Pass	
4.4'-DDD	mg/kg	< 0.01			0.01	Pass	
4.4'-DDE	mg/kg	< 0.01			0.01	Pass	
4.4'-DDT	mg/kg	< 0.01			0.01	Pass	
a-BHC	mg/kg	< 0.01			0.01	Pass	
Aldrin	mg/kg	< 0.01			0.01	Pass	
b-BHC	mg/kg	< 0.01			0.01	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
cis-Chlordane	mg/kg	< 0.01			0.01	Pass	
d-BHC	mg/kg	< 0.01			0.01	Pass	
Dieldrin	mg/kg	< 0.01			0.01	Pass	
Endosulfan I	mg/kg	< 0.01			0.01	Pass	
Endosulfan II	mg/kg	< 0.01			0.01	Pass	
Endosulfan sulphate	mg/kg	< 0.01			0.01	Pass	
Endrin	mg/kg	< 0.01			0.01	Pass	
Endrin aldehyde	mg/kg	< 0.01			0.01	Pass	
Endrin ketone	mg/kg	< 0.01			0.01	Pass	
g-BHC (Lindane)	mg/kg	< 0.01			0.01	Pass	
Heptachlor	mg/kg	< 0.01			0.01	Pass	
Heptachlor epoxide	mg/kg	< 0.01			0.01	Pass	
Hexachlorobenzene	mg/kg	< 0.01			0.01	Pass	
Methoxychlor	mg/kg	< 0.01			0.01	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
trans-Chlordane	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Metals M8 (NZ MfE)							
Arsenic	mg/kg	< 0.1			0.1	Pass	
Cadmium	mg/kg	< 0.01			0.01	Pass	
Chromium	mg/kg	< 0.1			0.1	Pass	
Copper	mg/kg	< 0.1			0.1	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	mg/kg	< 5			5	Pass	
TPH-SG C10-C14	mg/kg	< 10			10	Pass	
TPH-SG C15-C36	mg/kg	< 20			20	Pass	
TPH-SG C7-C36 (Total)	mg/kg	< 35			35	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	mg/kg	< 0.03			0.03	Pass	
Acenaphthylene	mg/kg	< 0.03			0.03	Pass	
Anthracene	mg/kg	< 0.03			0.03	Pass	
Benz(a)anthracene	mg/kg	< 0.03			0.03	Pass	
Benzo(a)pyrene	mg/kg	< 0.03			0.03	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.03			0.03	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.03			0.03	Pass	
Chrysene	mg/kg	< 0.03			0.03	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	mg/kg	< 0.03			0.03	Pass	
Fluoranthene	mg/kg	< 0.03			0.03	Pass	
Fluorene	mg/kg	< 0.03			0.03	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.03			0.03	Pass	
Naphthalene	mg/kg	< 0.1			0.1	Pass	
Phenanthrene	mg/kg	< 0.03			0.03	Pass	
Pyrene	mg/kg	< 0.03			0.03	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	80			70-130	Pass	
Dimethoate	%	81			70-130	Pass	
Ethion	%	115			70-130	Pass	
Fenitrothion	%	83			70-130	Pass	
Methyl parathion	%	84			70-130	Pass	
Mevinphos	%	78			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	82			70-130	Pass	
2.4-DB	%	85			70-130	Pass	
2.4.5-T	%	97			70-130	Pass	
2.4.5-TP	%	97			70-130	Pass	
Actril (loxynil)	%	101			70-130	Pass	
Dicamba	%	112			70-130	Pass	
Dichlorprop	%	94			70-130	Pass	
Dinitro-o-cresol	%	107			70-130	Pass	
Dinoseb	%	102			70-130	Pass	
MCPA	%	95			70-130	Pass	
MCPB	%	85			70-130	Pass	
Mecoprop	%	92			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides (NZ MfE)							
2.4'-DDD	%	121			70-130	Pass	
2.4'-DDE	%	114			70-130	Pass	
2.4'-DDT	%	115			70-130	Pass	
4.4'-DDD	%	124			70-130	Pass	
4.4'-DDE	%	93			70-130	Pass	
4.4'-DDT	%	75			70-130	Pass	
a-BHC	%	128			70-130	Pass	
Aldrin	%	105			70-130	Pass	
b-BHC	%	124			70-130	Pass	
Chlordanes - Total	%	108			70-130	Pass	
cis-Chlordane	%	112			70-130	Pass	
d-BHC	%	128			70-130	Pass	
Dieldrin	%	93			70-130	Pass	
Endosulfan I	%	93			70-130	Pass	
Endosulfan II	%	117			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	105			70-130	Pass	
Endrin aldehyde	%	95			70-130	Pass	
Endrin ketone	%	102			70-130	Pass	
g-BHC (Lindane)	%	113			70-130	Pass	
Heptachlor	%	122			70-130	Pass	
Heptachlor epoxide	%	98			70-130	Pass	
Hexachlorobenzene	%	79			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methoxychlor	%	74			70-130	Pass	
trans-Chlordane	%	104			70-130	Pass	
LCS - % Recovery							
Metals M8 (NZ MfE)							
Arsenic	%	111			80-120	Pass	
Cadmium	%	104			80-120	Pass	
Chromium	%	101			80-120	Pass	
Copper	%	101			80-120	Pass	
Lead	%	106			80-120	Pass	
Mercury	%	103			80-120	Pass	
Nickel	%	103			80-120	Pass	
Zinc	%	110			80-120	Pass	
Lead	%	116			80-120	Pass	
LCS - % Recovery							
Total Petroleum Hydrocarbons (NZ MfE 1999)							
TPH-SG C7-C9	%	75			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (NZ MfE)							
Acenaphthene	%	128			70-130	Pass	
Acenaphthylene	%	119			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	115			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	%	85			70-130	Pass	
Benzo(g.h.i)perylene	%	97			70-130	Pass	
Benzo(k)fluoranthene	%	119			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a.h)anthracene	%	102			70-130	Pass	
Fluoranthene	%	119			70-130	Pass	
Fluorene	%	116			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	100			70-130	Pass	
Naphthalene	%	122			70-130	Pass	
Phenanthrene	%	116			70-130	Pass	
Pyrene	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M21-Ap18906	NCP	%	97			70-130	Pass	
Dimethoate	M21-Ap18906	NCP	%	72			70-130	Pass	
Ethion	M21-Ap18906	NCP	%	73			70-130	Pass	
Fenitrothion	M21-Ap18906	NCP	%	99			70-130	Pass	
Methyl parathion	M21-Ap18906	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
Actril (loxynil)	S21-Ap15878	NCP	%	106			70-130	Pass	
Dichlorprop	S21-Ap15878	NCP	%	94			70-130	Pass	
MCPA	S21-Ap15878	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (NZ MfE)				Result 1					
2.4'-DDD	K21-Ap14464	NCP	%	126			70-130	Pass	
2.4'-DDE	K21-Ap12140	NCP	%	117			70-130	Pass	
2.4'-DDT	K21-Ap14464	NCP	%	114			70-130	Pass	
4.4'-DDD	K21-Ap12140	NCP	%	126			70-130	Pass	
4.4'-DDE	K21-Ap12140	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	K21-Ap12140	NCP	%	72			70-130	Pass	
a-BHC	K21-Ap14464	NCP	%	128			70-130	Pass	
Aldrin	K21-Ap11679	NCP	%	117			70-130	Pass	
b-BHC	K21-Ap12140	NCP	%	108			70-130	Pass	
Chlordanes - Total	K21-Ap12140	NCP	%	96			70-130	Pass	
cis-Chlordane	K21-Ap14464	NCP	%	71			70-130	Pass	
d-BHC	K21-Ap12140	NCP	%	128			70-130	Pass	
Dieldrin	K21-Ap12140	NCP	%	96			70-130	Pass	
Endosulfan I	K21-Ap12140	NCP	%	88			70-130	Pass	
Endosulfan II	K21-Ap12140	NCP	%	114			70-130	Pass	
Endosulfan sulphate	K21-Ap12140	NCP	%	109			70-130	Pass	
Endrin	K21-Ap12140	NCP	%	112			70-130	Pass	
Endrin aldehyde	K21-Ap12140	NCP	%	88			70-130	Pass	
Endrin ketone	K21-Ap12140	NCP	%	122			70-130	Pass	
g-BHC (Lindane)	K21-Ap12140	NCP	%	123			70-130	Pass	
Heptachlor	K21-Ap14464	NCP	%	129			70-130	Pass	
Heptachlor epoxide	K21-Ap12140	NCP	%	129			70-130	Pass	
Hexachlorobenzene	K21-Ap12140	NCP	%	94			70-130	Pass	
Methoxychlor	K21-Ap12140	NCP	%	81			70-130	Pass	
trans-Chlordane	K21-Ap12140	NCP	%	124			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K21-Ap14491	CP	%	111			75-125	Pass	
Cadmium	K21-Ap14491	CP	%	102			75-125	Pass	
Chromium	K21-Ap14491	CP	%	103			75-125	Pass	
Copper	K21-Ap14491	CP	%	100			75-125	Pass	
Lead	K21-Ap14491	CP	%	107			75-125	Pass	
Mercury	K21-Ap14491	CP	%	111			75-125	Pass	
Nickel	K21-Ap14491	CP	%	98			75-125	Pass	
Zinc	K21-Ap14491	CP	%	104			75-125	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K21-Ap14501	CP	%	116			75-125	Pass	
Cadmium	K21-Ap14501	CP	%	106			75-125	Pass	
Chromium	K21-Ap14501	CP	%	103			75-125	Pass	
Copper	K21-Ap14501	CP	%	100			75-125	Pass	
Lead	K21-Ap14501	CP	%	110			75-125	Pass	
Mercury	K21-Ap14501	CP	%	103			75-125	Pass	
Nickel	K21-Ap14501	CP	%	100			75-125	Pass	
Zinc	K21-Ap14501	CP	%	106			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1					
Acenaphthene	K21-Ap14415	NCP	%	128			70-130	Pass	
Acenaphthylene	K21-Ap14415	NCP	%	129			70-130	Pass	
Anthracene	K21-Ap14415	NCP	%	129			70-130	Pass	
Benz(a)anthracene	K21-Ap14415	NCP	%	124			70-130	Pass	
Benzo(a)pyrene	K21-Ap14415	NCP	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	K21-Ap14415	NCP	%	90			70-130	Pass	
Benzo(g.h.i)perylene	K21-Ap14415	NCP	%	90			70-130	Pass	
Benzo(k)fluoranthene	K21-Ap14415	NCP	%	113			70-130	Pass	
Chrysene	K21-Ap14415	NCP	%	110			70-130	Pass	
Dibenz(a.h)anthracene	K21-Ap14415	NCP	%	96			70-130	Pass	
Fluoranthene	K21-Ap14415	NCP	%	120			70-130	Pass	
Fluorene	K21-Ap14415	NCP	%	124			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	K21-Ap14415	NCP	%	89			70-130	Pass	
Naphthalene	K21-Ap14415	NCP	%	126			70-130	Pass	
Phenanthrene	K21-Ap14415	NCP	%	117			70-130	Pass	
Pyrene	K21-Ap14415	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1					
TPH-SG C7-C9	K21-Ap14504	CP	%	76			70-130	Pass	
Spike - % Recovery									
Metals M8 (NZ MfE)				Result 1					
Arsenic	K21-Ap14511	CP	%	113			75-125	Pass	
Cadmium	K21-Ap14511	CP	%	115			75-125	Pass	
Chromium	K21-Ap14511	CP	%	116			75-125	Pass	
Copper	K21-Ap14511	CP	%	118			75-125	Pass	
Mercury	K21-Ap14511	CP	%	84			75-125	Pass	
Nickel	K21-Ap14511	CP	%	110			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	S21-Ap15877	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
2.4'-DDD	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDE	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
2.4'-DDT	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDD	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDE	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
4.4'-DDT	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
a-BHC	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Aldrin	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
b-BHC	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Chlordanes - Total	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
cis-Chlordane	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
d-BHC	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Dieldrin	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan I	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan II	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endosulfan sulphate	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin aldehyde	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Endrin ketone	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
g-BHC (Lindane)	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Heptachlor epoxide	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides (NZ MfE)				Result 1	Result 2	RPD			
Hexachlorobenzene	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Methoxychlor	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
trans-Chlordane	K21-Ap12139	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K21-Ap14490	CP	mg/kg	11	12	15	30%	Pass	
Cadmium	K21-Ap14490	CP	mg/kg	0.23	0.26	13	30%	Pass	
Chromium	K21-Ap14490	CP	mg/kg	16	18	15	30%	Pass	
Copper	K21-Ap14490	CP	mg/kg	48	54	13	30%	Pass	
Lead	K21-Ap14490	CP	mg/kg	26	30	14	30%	Pass	
Mercury	K21-Ap14490	CP	mg/kg	0.13	0.13	3.0	30%	Pass	
Nickel	K21-Ap14490	CP	mg/kg	14	16	13	30%	Pass	
Zinc	K21-Ap14490	CP	mg/kg	87	99	13	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K21-Ap14490	CP	%	17	17	1.0	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	M21-Ap18897	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	M21-Ap18897	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	M21-Ap18897	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	M21-Ap18897	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K21-Ap14500	CP	mg/kg	11	11	5.0	30%	Pass	
Cadmium	K21-Ap14500	CP	mg/kg	0.26	0.26	1.0	30%	Pass	
Chromium	K21-Ap14500	CP	mg/kg	18	18	4.0	30%	Pass	
Copper	K21-Ap14500	CP	mg/kg	78	82	6.0	30%	Pass	
Lead	K21-Ap14500	CP	mg/kg	31	33	5.0	30%	Pass	
Mercury	K21-Ap14500	CP	mg/kg	0.13	0.15	9.0	30%	Pass	
Nickel	K21-Ap14500	CP	mg/kg	15	16	4.0	30%	Pass	
Zinc	K21-Ap14500	CP	mg/kg	94	98	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K21-Ap14500	CP	%	18	18	1.0	30%	Pass	
Duplicate									
Total Petroleum Hydrocarbons (NZ MfE 1999)				Result 1	Result 2	RPD			
TPH-SG C7-C9	K21-Ap14503	CP	mg/kg	< 5	< 5	<1	30%	Pass	
TPH-SG C10-C14	K21-Ap14503	CP	mg/kg	< 10	< 10	<1	30%	Pass	
TPH-SG C15-C36	K21-Ap14503	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TPH-SG C7-C36 (Total)	K21-Ap14503	CP	mg/kg	< 35	< 35	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (NZ MfE)				Result 1	Result 2	RPD			
Acenaphthene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Acenaphthylene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Anthracene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benz(a)anthracene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(a)pyrene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(b&j)fluoranthene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(g.h.i)perylene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Benzo(k)fluoranthene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Chrysene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Dibenz(a.h)anthracene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluoranthene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Fluorene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Naphthalene	K21-Ap14414	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Phenanthrene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Pyrene	K21-Ap14414	NCP	mg/kg	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Metals M8 (NZ MfE)				Result 1	Result 2	RPD			
Arsenic	K21-Ap14510	CP	mg/kg	13	15	8.0	30%	Pass	
Cadmium	K21-Ap14510	CP	mg/kg	0.38	0.41	9.0	30%	Pass	
Chromium	K21-Ap14510	CP	mg/kg	18	19	6.0	30%	Pass	
Copper	K21-Ap14510	CP	mg/kg	55	60	9.0	30%	Pass	
Lead	K21-Ap14510	CP	mg/kg	65	69	6.0	30%	Pass	
Mercury	K21-Ap14510	CP	mg/kg	0.15	0.15	1.0	30%	Pass	
Nickel	K21-Ap14510	CP	mg/kg	15	16	7.0	30%	Pass	
Zinc	K21-Ap14510	CP	mg/kg	190	200	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	K21-Ap14510	CP	%	20	20	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
I12	Where sampling date has not been provided, Eurofins | Environment Testing is not able to determine whether analysis has been performed within recommended holding times.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N16	Analysis performed by Eurofins Environment Testing Australia

Authorised by:

Swati Shahaney	Analytical Services Manager
Joseph Edouard	Senior Analyst-Organic (VIC)
Michael Ritchie	Senior Analyst-Organic (NZN)
Shasti Ramachandran	Senior Analyst-Metal (NZN)

Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

WSP New Zealand Limited
Level 9 Majestic Centre, 100 Willis Street
Wellington
New Zealand 6144

Attention:	Hannah Juchnowicz
Report	786914-AID
Project Name	
Project ID	3 - AK085.00
Received Date	Apr 14, 2021
Date Reported	Apr 16, 2021

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence IANZ Accreditation does not cover the performance of this service (non-IANZ results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 3 - AK085.00
Date Sampled Apr 09, 2021
Report 786914-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
R1	21-Ap19555	Apr 09, 2021	Approximate Sample 698g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
R2	21-Ap19556	Apr 09, 2021	Approximate Sample 564g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
R3	21-Ap19557	Apr 09, 2021	Approximate Sample 501g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
R4	21-Ap19558	Apr 09, 2021	Approximate Sample 530g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
R5	21-Ap19559	Apr 09, 2021	Approximate Sample 467g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B1	21-Ap19560	Apr 09, 2021	Approximate Sample 532g Sample consisted of: Fine grained soil and rocks	FA: Chrysotile asbestos detected in weathered fibre cement fragments. Approximate raw weight of FA = 0.0095g Estimated asbestos content in FA = 0.0048g* AF: Chrysotile asbestos detected in fibre cement fragments and in the form of loose fibre bundles. Approximate raw weight of AF = 0.0011g* Estimated asbestos content in AF = 0.0011g* Total estimated asbestos content in FA and AF = 0.0059g* Total estimated asbestos concentration in FA and AF = 0.0011% w/w* Organic fibre detected. No respirable fibres detected.
B2	21-Ap19561	Apr 09, 2021	Approximate Sample 352g Sample consisted of: Fine grained soil and rocks	FA: Chrysotile and amosite asbestos detected in weathered fibre cement fragments. Approximate Raw weight of FA = 0.0028g Estimated asbestos content in FA = 0.0024g* AF: Chrysotile and amosite asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0020g* Estimated asbestos content in AF = 0.0020g* Total estimated asbestos content in FA and AF = 0.0044g* Total estimated asbestos concentration in FA and AF = 0.0012% w/w* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
B3	21-Ap19562	Apr 09, 2021	Approximate Sample 608g Sample consisted of: Fine grained soil and rocks	AF: Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.00060g* Estimated asbestos content in AF = 0.00060g* Total estimated asbestos concentration in AF = 0.000099% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B4	21-Ap19563	Apr 09, 2021	Approximate Sample 568g Sample consisted of: Fine grained soil and rocks	AF: Chrysotile and amosite asbestos detected in fibre cement fragments and in the form of loose fibre bundles. Approximate raw weight of AF = 0.0093g* Estimated asbestos content in AF = 0.0019g* Total estimated asbestos concentration in AF = 0.00033% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
B5	21-Ap19564	Apr 09, 2021	Approximate Sample 772g Sample consisted of: Fine grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Christchurch	Apr 14, 2021	Indefinite

eurofins | Environment Testing

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NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

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Phone : +61 2 4968 8448

Company Name: WSP New Zealand Limited
Address: Level 9 Majestic Centre, 100 Willis Street
Wellington
New Zealand 6144

Project Name:
Project ID: 3 - AK085.00

Order No.:
Report #: 786914
Phone: 0011 64 4 471 7160
Fax:

Received: Apr 14, 2021 9:14 AM
Due: Apr 16, 2021
Priority: 2 Day
Contact Name: Hannah Juchnowicz

Eurofins Analytical Services Manager : Swati Shahaney

Sample Detail						Asbestos - WA guidelines
Auckland Laboratory - IANZ# 1327						
Christchurch Laboratory - IANZ# 1290						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	R1	Apr 09, 2021		Soil	Z21-Ap19555	X
2	R2	Apr 09, 2021		Soil	Z21-Ap19556	X
3	R3	Apr 09, 2021		Soil	Z21-Ap19557	X
4	R4	Apr 09, 2021		Soil	Z21-Ap19558	X
5	R5	Apr 09, 2021		Soil	Z21-Ap19559	X
6	B1	Apr 09, 2021		Soil	Z21-Ap19560	X
7	B2	Apr 09, 2021		Soil	Z21-Ap19561	X
8	B3	Apr 09, 2021		Soil	Z21-Ap19562	X
9	B4	Apr 09, 2021		Soil	Z21-Ap19563	X
10	B5	Apr 09, 2021		Soil	Z21-Ap19564	X
Test Counts						10

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Katyana Gausel	Senior Analyst-Asbestos (Key Technical Personnel) (NZS)

Authorised by:

Irene Suresh	Senior Analyst-Asbestos (NZS)

Katyana Gausel
Senior Analyst-Asbestos (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates ISO/IEC 17025:2017 accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix E

Analytical Results Tables

Table E1

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Heavy Metals

Location	Background Soil Concentration - Wellington Region - Type 3 (Hutt Alluvium) [1]	NESCS - Human Health - Residential [2]	Open Fields							Tunnel House
WSP Sample Name			Comp C1	Comp C2	C2-4	Comp C3	C3-5	Comp C4	C4-1	Comp T
Laboratory Report Number			786278	786278	786278	786278	786278	786278	786278	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021
Heavy Metals (mg/kg)										
Arsenic	7	20	**11**	**12**	**11**	**11**	**11**	**12**	**12**	**12**
Cadmium	0.2	3	**0.23**	**0.3**	**0.28**	**0.29**	**0.26**	**0.34**	**0.3**	**0.35**
Chromium (III+VI)	18	460	16	18	17	18	18	**20**	18	**19**
Copper	19	NL	**48**	**76**	**82**	**78**	**78**	**98**	**93**	**76**
Lead	73	210	26	34	33	31	31	37	31	35
Mercury	0.1	310	**0.13**	**0.12**	**0.12**	**0.13**	**0.13**	**0.14**	**0.18**	**0.15**
Nickel	21	400 [3]	14	16	15	16	15	17	16	16
Zinc	121	8000 [3]	87	100	98	95	94	100	97	110

Location	Background Soil Concentration - Wellington Region - Type 3 (Hutt Alluvium) [1]	NESCS - Human Health - Residential [2]	Glasshouse One	Glasshouse Two	Drainage Ditch			In-situ Building		
WSP Sample Name			Comp G1	G2	D1	D2	D3	B1	B2	B3
Laboratory Report Number			786278	786278	786278	786278	786278	786278	786278	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	9/04/2021	9/04/2021	9/04/2021
Heavy Metals (mg/kg)										
Arsenic	7	20	**12**	**13**	**8.8**	**26**	**13**	-	-	-
Cadmium	0.2	3	**0.23**	**0.27**	**0.66**	**0.63**	**0.37**	-	-	-
Chromium (III+VI)	18	460	**19**	17	15	**42**	18	-	-	-
Copper	19	NL	**51**	**110**	**52**	**190**	**83**	-	-	-
Lead	73	210	49	**120**	32	73	61	**100**	**210**	65
Mercury	0.1	310	**0.13**	**0.18**	**0.18**	**0.21**	**0.16**	-	-	-
Nickel	21	400 [3]	15	12	14	19	14	-	-	-
Zinc	121	8000 [3]	**150**	**150**	**160**	**460**	**140**	-	-	-

Key:

Bold + Underlined Exceeds Background Concentrations

Exceeds the Human Health Criteria

Notes:

1 - URS New Zealand Limited (2003) Determination of Common Pollutant Background Soil Concentrations for the Wellington Region - Main Soil Type 3 (Hutt Alluvium)

2 - MfE (2011) Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health

3 - Guideline on the Investigation Levels for Soil and Groundwater (NEPM, 2011) - Schedule B7 Appendix A1 . Values applicable for a residential landuse have been selected

Table E1

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Heavy Metals

Location	Background Soil Concentration - Wellington Region - Type 3 (Hutt Alluvium) [1]	NESCS - Human Health - Residential [2]	In-situ Building		Former Rubbish Piles				
WSP Sample Name			B4	B5	R1	R2	R3	R4	R5
Laboratory Report Number			786278	786278	786278	786278	786278	786278	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Heavy Metals (mg/kg)									
Arsenic	7	20	**37**	**14**	**15**	**16**	**9.8**	**8.7**	**12**
Cadmium	0.2	3	**1.3**	**0.43**	**0.35**	**0.42**	**0.68**	0.14	**1.1**
Chromium (III+VI)	18	460	**23**	**21**	**19**	17	**22**	15	**24**
Copper	19	NL	**48**	**97**	**77**	**170**	**38**	17	**300**
Lead	73	210	**220**	50	**76**	**78**	**150**	42	**260**
Mercury	0.1	310	**0.17**	**0.16**	**0.16**	**0.16**	**0.23**	**0.11**	**0.15**
Nickel	21	400 [3]	20	17	15	14	15	12	15
Zinc	121	8000 [3]	**940**	**190**	**170**	**220**	**280**	100	**510**

Key:

Bold + Underlined Exceeds Background Concentrations

Exceeds the Human Health Criteria

Notes:

1 - URS New Zealand Limited (2003) Determination of Common Pollutant Background Soil Concentrations for the Wellington Region - Main Soil Type 3 (Hutt Alluvium)

2 - MfE (2011) Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health

3 - Guideline on the Investigation Levels for Soil and Groundwater (NEPM, 2011) - Schedule B7 Appendix A1 . Values applicable for a residential landuse have been selected

Table E2

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Total Petroleum Hydrocarbons

Location	Background Soil Concentration - Wellington Region - Type 1 (Sand) [1]	Tier 1 Soil Acceptance Criteria - Residential - All Pathways - Sand [3]	Former Rubbish Piles					In-situ Building	
WSP Sample Name			R1	R2	R3	R4	R5	B4	B5
Laboratory Report Number			786278	786278.0	786278	786278.0	786278	786278.0	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Total Petroleum Hydrocarbons (mg/kg)									
TPH C_7-C_9 Fraction	-	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TPH C_{10}-C_{14} Fraction	-	470	< 10	< 10	< 10	< 10	< 10	10	< 10
TPH C_{15}-C_{36} Fraction	-	N/A	< 20	< 20	50	< 20	470	580	230
TPH C_7-C_{36} (Total)	260 [2]	N/A	< 35	< 35	51	< 35	**470**	**590**	**230**

Key:

Bold + Underlined Exceeds Background Concentrations

Exceeds the Human Health Criteria

Notes:

1 - URS New Zealand Limited (2003) Determination of Common Pollutant Background Soil Concentrations for the Wellington Region - Main Soil Type 3 (Hutt Alluvium)

2 - Criteria for TPH C_7 - C_{44} fraction adopted in absence of a TPH C_7 - C_{36} (Total) fraction.

3 - Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Module 4, Table 4.13 (TPH - Residential). Values applicable to 'Residential' land use for a 'sand' soil type at <1m depth have been selected.

Table E3

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Polycyclic Aromatic Hydrocarbons

Location	Background Soil Concentration - Wellington Region - Type 1 (Sand) [1]	NESCS - Human Health - Residential [1]	Former Rubbish Piles					In-situ Building	
WSP Sample Name			R1	R2	R3	R4	R5	B4	B5
Laboratory Report Number			786278	786278	786278	786278	786278	786278	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Polycyclic Aromatic Hydrocarbons (mg/kg)									
Acenaphthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.04	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benz[a]anthracene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]pyrene (BaP)	0.33	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)	-	10	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)	-	-	0.08	0.08	0.08	0.08	0.07	0.08	0.08
Benzo[b+J]fluoranthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[g,h,i]perylene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[k]fluoranthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Dibenz[a,h]anthracene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.39	-	< 0.03	< 0.03	< 0.03	< 0.03	0.06	< 0.03	< 0.03
Fluorene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.01	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	-	-	< 0.03	< 0.03	0.12	< 0.03	0.06	< 0.03	< 0.03
Pyrene	0.46	-	< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03	< 0.03

Key:

Bold + Underlined Exceeds Background Concentrations

Exceeds the Human Health Criteria

Notes:

1 - URS New Zealand Limited (2003) Determination of Common Pollutant Background Soil Concentrations for the Wellington Region - Main Soil Type 3 (Hutt Alluvium)

2 - Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Module 4, Table 4.10 (MAH/PAH - Residential). Values applicable to 'Residential' land use for a 'sand' soil type at <1m depth have been selected.

Table E3

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Polycyclic Aromatic Hydrocarbons

Location	Background Soil Concentration - Wellington Region - Type 1 (Sand) [1]	NESCS - Human Health - Residential [1]	Former Rubbish Piles					In-situ Building	
WSP Sample Name			R1	R2	R3	R4	R5	B4	B5
Laboratory Report Number			786278	786278	786278	786278	786278	786278	786278
Sample Depth			Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Polycyclic Aromatic Hydrocarbons (mg/kg)									
Acenaphthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	0.04	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benz[a]anthracene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]pyrene (BaP)	0.33	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (lower bound)	-	10	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene TEQ (medium bound)	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Benzo(a)pyrene TEQ (upper bound)	-	-	0.08	0.08	0.08	0.08	0.07	0.08	0.08
Benzo[b+J]fluoranthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[g,h,i]perylene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[k]fluoranthene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Dibenz[a,h]anthracene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	0.39	-	< 0.03	< 0.03	< 0.03	< 0.03	0.06	< 0.03	< 0.03
Fluorene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Naphthalene	0.01	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	-	-	< 0.03	< 0.03	0.12	< 0.03	0.06	< 0.03	< 0.03
Pyrene	0.46	-	< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03	< 0.03

Key:

Bold + Underlined Exceeds Background Concentrations

Exceeds the Human Health Criteria

Notes:

1 - URS New Zealand Limited (2003) Determination of Common Pollutant Background Soil Concentrations for the Wellington Region - Main Soil Type 3 (Hutt Alluvium)

2 - Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Module 4, Table 4.10 (MAH/PAH - Residential). Values applicable to 'Residential' land use for a 'sand' soil type at <1m depth have been selected.

Table E4

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Pesticides

Location		Wider Fields							Tunnel House	Glasshouse One	Glasshouse Two
WSP Sample Name		Comp C1	Comp C2	C2-4	Comp C3	C3-5	Comp C4	C4-1	Comp T	Comp G1	G2
Laboratory Report Number	NESCS - Human Health - Residential [1]	786278	786278	786278	786278	786278	786278	786278	786278	786278	786278
Sample Depth		Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit		Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date		8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021	8/04/2021
Organochlorine Pesticides (mg/kg)											
2,4'-DDD	-	0.01	0.01	0.01	0.01	< 0.01	< 0.01	0.01	0.01	< 0.01	0.03
4,4'-DDD	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01
2,4'-DDE	-	0.01	0.01	0.04	0.04	0.05	0.05	0.06	0.04	0.01	0.12
4,4'-DDE	-	0.01	0.01	0.04	0.02	0.02	0.02	0.04	0.01	< 0.01	0.22
2,4'-DDT	-	0.04	0.12	0.11	0.17	0.11	0.13	0.12	0.11	0.04	0.16
4,4'-DDT	-	0.04	0.07	0.06	0.07	0.02	0.07	0.04	0.08	0.01	0.57
Total DDT Isomers	70	0.11	0.22	0.26	0.31	0.2	0.27	0.27	0.25	0.06	1.1
Endosulfan I	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01	0.03
Endosulfan II	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.41	< 0.01	0.09
Endosulfan sulphate	-	0.01	0.04	0.04	0.01	< 0.01	0.05	0.01	3.6	0.03	1.4
18 other OCP compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
Organophosphorus Pesticides (mg/kg)											
34 OPP compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
Acid Herbicides (mg/kg)											
12 acid herbicide compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR

Key:

LOR Limit of Reporting

Exceeds the Human Health Criteria

Notes:

1 - MfE (2011) Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health

Table E4

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Pesticides

Location		Drainage Ditch			In-situ Building	Former Rubbish Piles				
WSP Sample Name		D1	D2	D3	B1	R1	R2	R3	R4	R5
Laboratory Report Number	NESCS - Human Health - Residential [1]	786278	786278	786278	786278	786278	786278	786278	786278	786278
Sample Depth		Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Geological Unit		Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date		8/04/2021	8/04/2021	8/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Organochlorine Pesticides (mg/kg)										
2,4'-DDD	-	< 0.01	0.07	< 0.01	0.01	0.03	0.04	< 0.01	< 0.01	0.01
4,4'-DDD	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4'-DDE	-	0.02	0.08	0.02	0.04	0.05	0.07	< 0.01	< 0.01	0.03
4,4'-DDE	-	< 0.01	0.02	< 0.01	0.04	0.01	0.03	< 0.01	< 0.01	0.01
2,4'-DDT	-	0.05	0.2	0.09	0.11	0.08	0.1	0.01	< 0.01	0.03
4,4'-DDT	-	< 0.01	0.03	0.02	0.06	0.01	0.04	< 0.01	< 0.01	0.01
Total DDT Isomers	70	0.07	0.4	0.13	0.26	0.18	0.28	0.01	< 0.01	0.09
Endosulfan I	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan II	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.03
Endosulfan sulphate	-	< 0.01	0.03	< 0.01	0.04	0.03	0.23	< 0.01	< 0.01	0.04
18 other OCP compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
Organophosphorus Pesticides (mg/kg)										
34 OPP compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR
Acid Herbicides (mg/kg)										
12 acid herbicide compounds	-	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR	< LOR

Key:

LOR Limit of Reporting

Exceeds the Human Health Criteria

Notes:

1 - MfE (2011) Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health

Table E5

3-AK085.00 - KCDC Rangiuru Road Due Diligence - 254 Rangiuru Road, Otaki

Analytical Soil Results - Asbestos (Quantitative)

Location	Class B: Nonfriable Criteria	NZ GAMAS - Soil Guideline Values for Asbestos - Residential	Former Rubbish Piles				
WSP Sample Name			R1	R2	R3	R4	R5
Laboratory Report Number			786914	786914	786914	786914	786914
Sample Depth			Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Semi-Qualitative Asbestos (NZ GAMAS Method)							
Asbestos (presence/absence)	-	-	NAD	NAD	NAD	NAD	NAD
Asbestos in ACM as % of Total Sample	-	0.02	-	-	-	-	-
FA / AF as % of Total Sample	0.01	0.001	-	-	-	-	-

Location	Class B: Nonfriable Criteria	NZ GAMAS - SGV for Asbestos - Residential	In-situ Building				
WSP Sample Name			B1	B2	B3	B4	B5
Laboratory Report Number			786914	786914	786914	786914	786914
Sample Depth			Surface	Surface	Surface	Surface	Surface
Geological Unit			Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Sampling Date			9/04/2021	9/04/2021	9/04/2021	9/04/2021	9/04/2021
Semi-Qualitative Asbestos (NZ GAMAS Method)							
Asbestos (presence/absence)	-	-	Chrysotile	Chrysotile and Amosite	Chrysotile	Chrysotile	NAD
Asbestos in ACM as % of Total Sample	-	0.02	-	-	-	-	-
FA / AF as % of Total Sample	0.01	0.001	0.0011	0.0012	< 0.001	< 0.001	-

Key

Exceeds Class B Criteria

Exceeds the Human Health Criteria

Abbreviations:

ACM = Asbestos-Containing Material

NAD = No Asbestos Detected

Notes:

BRANZ New Zealand Guidelines for the Assessment and Management of Asbestos in Soil (2017) - Residential landuse criteria applied