THE HAMPTONS

BY URBAN **ESTATES**

Soil Validation Report

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ENGEO Document Control:

Report Title	Soil Validation Report - 174 Hamptons Road, Prebbleton			
Project No.	017707.000.000	**Doc ID**	06	
Client	Urban Estates Limited	**Client Contact**	Brad Wilson	
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12/07/2024	Issued to Client	NF	DR	HO

SQEP Certifying Statement

I certify that the site has been assessed in accordance with current New Zealand Regulations and guidance documents and that this report has been prepared in general accordance with the Ministry for the Environment's Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand, 2021.

I am considered by ENGEO Limited to be a suitably qualified and experienced practitioner (SQEP) able to certify reports pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.

Dave Robotham

12/07/2024

ENGEO Limited requires that a SQEP has the following Qualifications / Experience:

- *Tertiary science or engineering qualification relevant to environmental assessment.*
- *A minimum of 10 years of relevant experience.*
- *Registration with a professional body that assess and certifies environmental professionals in the competency criteria of training, experience, professional conduct, and ethical behaviour.*

1 Introduction

ENGEO Ltd was requested by Urban Estates Ltd to prepare a soil validation report of the property at 174 Hamptons Road, Prebbleton, Christchurch (herein referred to as 'the site'). This work has been carried out in accordance with our signed agreement dated 3 October 2023.

This report was prepared in general accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites in New Zealand.

1.1 Objectives of Site Validation Report

This validation report is required to be sent to Selwyn District Council to seek acknowledgement that contaminants of concern relating to the site are below the relevant land use standards (residential 10% produce land use). Following acknowledgement from Selwyn District Council that the contamination has been successfully remediated to the appropriate level, it is anticipated that the subdivision development can proceed.

Please note that this report is for the validation of the targeted remediation areas only and does not seek to provide a full characterisation of soil across the whole site. ENGEO previously completed various preliminary and detailed intrusive investigations for the remainder of the site, and it is recommended that these DSI reports are read in conjunction with this report.

1.2 Consent Conditions

Condition 18-24 of the Selwyn District Council Consent RC 235448 and RC 235449 requires that this document includes sufficient detail to address the following:

18. All earthworks shall be undertaken in accordance with the approved amended remedial action plan by a SQEP in contaminated land.

19. Any contaminated soils removed from the site will not be suitable to be disposed of at a cleanfill facility and must be disposed of at a facility whose waste acceptance criteria would be met. Evidence of waste disposal such as weighbridge receipt weighbridge receipts or waste manifest should be submitted to the Selwyn District Council within three months of completion of works. (This could be included in the Site Validation Report).

20. The areas identified in both PSI / DSIs by ENGEO as having contaminant concentrations in excess of the NESCS SCS for residential 10% produce land use, including additional areas from further delineation by a SQEP, should be remediated and validated to below NESCS soil contaminant standard (SCS) for residential 10% produce land use.

21. In the event of contamination discovery e.g. visible staining, odours and / or other conditions that indicate soil contamination, then work must cease until a Suitably Qualified and Experienced Practitioner (SQEP) has assessed the matter and advised of the appropriate remediation and / or disposal options for these soils. Any discovered contamination should be reported to the Selwyn District Council within 10 working days.

22. Within three months of the completion of the works, the site validation report shall be prepared by the project's SQEP in contaminated land and outline the works undertaken. The site validation report shall include at least the following:

    a) Plan showing the location of the remediated areas;

    b) Full chronological, illustrated description of the remedial works including the collection of validation samples after removal of all the materials and prior to backfilling / reinstatement;

    c) Records of any contaminated land related incidents related to the release of soil contaminants;

    d) Information on additional investigations;

    e) Records and details of any discovered contamination;

    f) Statement of the volumes of soil:

        i) Disturbed by the works

        ii) Disposed off site and conformation of disposal facility

        iii) Cleanfill materials imported to site (if any, including the source of this material including any supporting analytical data where appropriate); and

    g) Validation test results confirming all remaining soil meets the NESCS for residential 10% land use including sampling locations and depths.

23. Prior to issuance of s224/title certificates, the site validation report shall be provided to Selwyn District Council.

24. That where evidence of a contaminated site not identified in the application is found at any stage of the subdivision development works, then site works shall immediately cease within 10 metres of the contamination until the risk has been assessed by an Appropriately Qualified Environmental Practitioner in accordance with current Ministry for the Environment Guidelines and, if required, a resource consent obtained under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (or most recent subsequent amendment). Once the risk has been assessed and any required resource consent obtained, the consent holder shall undertake all necessary work to rehabilitate the site in accordance with either the standards for permitted activities or the conditions of the resource consent (as appropriate). All works shall be undertaken at the consent holder's expense.

2 Site Description

Site information is summarised in Table 1.

Table 1: Site Information

Item	Description
Location	174 Hamptons Road, Prebbleton
Legal Description	LOT 2 DP 366875 BLK XIII CHRISTCHURCH SD
Site Area	5.34 ha
Property Owner	Urban Estates Limited
Current Land Use	Residential and Horticultural – glasshouses growing asparagus and flowers
Proposed Land Use	Standard residential subdivision, for single dwelling sites with gardens, including home-grown produce consumption (10%)
Territorial Authority	Selwyn District Council
Zoning	Inner Plains

3 Previous Investigations

ENGEO Combined Preliminary and Detailed Site Investigation – October 2020

ENGEO completed a combined PSI and DSI report in October 2020. ENGEO's assessment sought to evaluate the presence of contaminants of concern associated with the previous land uses and assess the significance of risk to human health and environmental receptors. The assessment included a site walkover, review of current conditions and the completion of an intrusive investigation and sampling programme.

An intrusive investigation was undertaken and included sampling of soils around the on-site glasshouses, the on-site dwelling, a burn pile and a former building area. The investigation strategy, sampling methodology and assessment were designed and supervised by a contaminated land professional who meets the definition of a suitably qualified and experienced practitioner (SQEP) as described in the MfE (2012) Users' Guide: NES for Assessing and Managing Contaminants in Soil to Protect Human Health.

The analytical results from the ENGEO investigation can be summarised as follows:

- Two samples collected from in or around the glasshouses have been reported above the SCS for residential land use for arsenic (S3 and S6). Other samples collected from in and around the glasshouses (S1 – S8) have reported arsenic, cadmium, copper, lead, and zinc above the site-specific regional levels.

- One sample collected from an area of previous sheds / small structures has reported concentrations of lead above the SCS for residential land use (S9). All three samples collected from this area have reported lead above the site-specific regional levels. Asbestos semi-quantitative analysis from three samples reported negative for asbestos fines and fibres.
- One sample collected from the burn pile reported concentrations of arsenic, chromium and lead above the SCS for residential land use. Arsenic was also reported above the commercial / industrial outdoor worker criteria. All heavy metals analysed were reported above the site-specific regional levels. Polycyclic aromatic hydrocarbons all returned below the laboratory limit of detection except phenanthrene and naphthalene concentrations which are below the guideline values.
- Seven samples collected from around the dwelling for lead have returned concentrations above the SCS for residential land use. All samples collected for lead around the dwelling were reported above the site-specific regional levels.

ENGEO Letter Addendum Report – May 2023

Due to the original DSI report being dated 2020, it was recommended that an additional site walkover and resampling of the on-site burn pile was undertaken. No additional areas of concern were identified on the site during the walkover. An additional five soil samples were collected from the burn pile with analysis for heavy metals.

The analytical results from the ENGEO additional investigation can be summarised as below:

- The sample collected from S28 (middle of the burn pile) reported concentrations of arsenic above the NES residential land use and NES commercial / industrial outdoor worker criteria.
- Samples S29, S31, and S32 reported concentrations of arsenic above the NES residential land use criteria.
- Several samples reported concentrations of arsenic, cadmium, chromium, copper, lead, and zinc above the site-specific regional background criteria for the site.
- The TCLP analysis on S28 also reported arsenic above the Kate Valley Landfill acceptance criteria.

4 Remediation

4.1 Remedial Method

The chosen remedial method was excavation and disposal off-site in the four remedial areas completed in this report. Please note that Area 5 around the dwelling is still to be remediated, but will be completed with subsequent validation testing and SQEP oversight in a later stage of the site development works.

4.2 Validation Sampling

Upon completion of the soil excavation, ENGEO undertook validation sampling at each site. The ENGEO representative completed the following during the soil sampling:

- Inspection of each remedial grid for visual and olfactory indicators of contamination.

- Collection of soil samples from the walls and base of the excavations. The samples were compressed directly into laboratory supplied containers using a new pair of nitrile gloves for each sample. Prior to sampling, the equipment (hand trowel) was decontaminated using a triple wash procedure with potable water, Decon 90 solution, and deionised water.
- Submission of soil samples to R J Hill Laboratories in Hamilton (chemical analysis) under standard ENGEO chain of custody.

Quality Assurance and Quality Control

The quality assurance / quality control (QA/QC) procedures employed during the works included:

- Standard sample registers and chain of custody records have been kept for all samples.
- The use of Hills who are an International Accreditation New Zealand (IANZ) laboratory, to conduct all analysis. To maintain their accreditation, Hills laboratories undertake rigorous cross checking and routine duplicate sample testing to ensure the accuracy of their results.
- During the site investigation, every attempt was made to ensure that cross contamination did not occur through the use of the procedures outlined within this document.

Additionally, the Relative Percent Difference (RPD) was calculated using original and duplicate samples collected on-site to assess the quality of laboratory reporting. An acceptable RPD is less than 30%, indicating that should any cross contamination have occurred during the sampling process it did not affect the results. The RPD is calculated as follows:

$$Relative\ Percentage\ Difference = \frac{|Original\ Sample\ Value - Duplicate\ Sample\ Value|}{Mean\ of\ Sample\ Values} \times 100$$

Table 2 summarises the results of RPD calculations.

Table 2: RPD Calculations

Analyte	RPD # 1 (A4VS03 & DUPLICATE)
Arsenic	57.1
Cadmium	0
Chromium	22.2
Copper	18.2
Lead	7.12
Nickel	0
Zinc	4.3

Note: Values have been rounded to the nearest decimal place.

The only analyte exceeding the 30% threshold is arsenic with a 57.1 RPD. It is considered that this difference is marginal as the remaining material from below Area 4 which was significantly contaminated with arsenic prior to remediation (10,300 mg/kg) is likely to be slightly varied in small locations due to the inhomogeneous nature of the impacted burnt material.

5 Soil Validation Visits

Validation sampling was undertaken on 27 May 2024 and 7 June 2024 by an ENGEO Environmental Consultant.

Area 1

The soil in Area 1 was free from any visual or olfactory indicators of waste. The area was excavated in a 4.5 x 4.5 m grid down to 0.3 m in depth. Remedial area and sample locations in included in Figure 2 appended.

Figure 1: Area 1 Photographs

Photo 1: 7 June 2024 Area 1 looking southwest

Photo 2: 7 June 2024 Area 1 300 mm deep side wall

Photo 3: 7 June 2024 Area 1 looking west

Photo 4: 7 June 2024 Area 1 looking east

Area 2

The soil in Area 1 was free from any visual or olfactory indicators of waste. The area was excavated in a 16 x 10 m grid down to 0.2 to 0.5 m in depth. Please note that the majority of the grid was excavated to 0.2 m depth and then additional excavations undertaken after initial samples were completed down to 0.5 m depth. Remedial area and sample locations in included in Figure 3 appended.

Figure 2: Area 2 Photographs

Photo 5: 7 June 2024 Area 2 looking north

Photo 6: 7 June 2024 Area 2 looking northwest

Photo 7: 7 June 2024 Area 2 western side wall – 500 mm

Photo 8: 7 June 2024 Area 2 eastern side wall – 200 mm

Area 3

The soil in Area 1 was free from any visual or olfactory indicators of waste. The area was excavated in a 6 x 5 m grid down to 0.3 m in depth. Remedial area and sample locations are included in Figure 4 appended.

Figure 3: Area 3 Photographs

Photo 9: 7 June 2024 Area 3 side wall 350 mm excavation

Photo 10: 7 June 2024 Area 3 looking northwest

Photo 11: 7 June 2024 Area 3 looking west

Photo 12: 7 June 2024 Area 3 looking south

Area 4

The soil in Area 1 was free from any visual or olfactory indicators of waste. The area was excavated in a 7.5 x 7.5 m grid down to 0.3 m in depth. Remedial area and sample locations are included in Figure 5 appended.

Figure 4: Area 4 Photographs

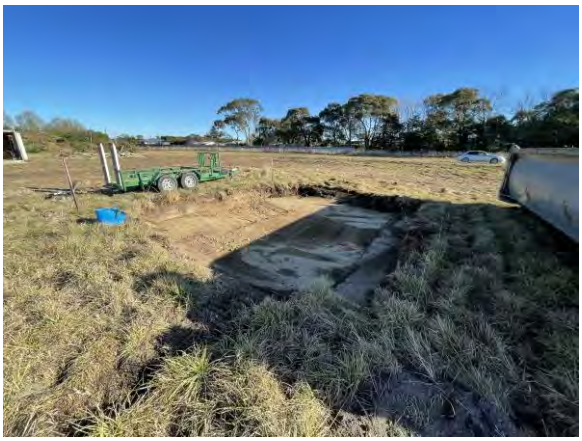


Photo 13: 7 June 2024 Area 4 looking southwest

Photo 14: 7 June 2024 Area 4 looking west

Photo 15: 7 June 2024 Area 4 looking northwest

6 Contractor Documentation

6.1 Soil Disposal Documentation

The following documentation was provided by Frews who were involved with the remedial works, including the cartage of contaminated soil off-site to various landfills. All waste dockets are provided in Appendix 1. A summary is provided in Table 3 below.

Please note that the initial remedial excavation was undertaken in Area 4 with soils being disposed of to Enviro NZ. Upon validation sampling, further remediation was required in this area however the *in situ* soils were suitable for disposal to Frews Hororata.

Table 3: Waste Disposal Information

Date	Disposal Location	Waste Docket No.	Weight, tonnes
28/05/2024	Enviro NZ	20396	43.48
17/05/2024	Frews Hororata	C37529	4.76
23/05/2024	Frews Hororata	P36631	13.5
23/05/2024	Frews Hororata	P36632	13.58
23/05/2024	Frews Hororata	C37622	3.78
23/05/2024	Frews Hororata	P36635	8.02
23/05/2024	Frews Hororata	P36638	20.96
23/05/2024	Frews Hororata	P36646	25.5
24/05/2024	Frews Hororata	P36654	21.08
30/05/2024	Frews Hororata	C37719	3.52
Total			154.4 tonnes

6.2 Asbestos Surveys

ENGEO was engaged by Urban Estates to complete asbestos demolition surveys of pre-2000 constructed on-site outbuildings that were required to be demolished as part of this stage of works. Please refer to Appendix 2 for the ENGEO Demolition survey. No asbestos containing materials were identified.

The remaining dwelling will have an asbestos demolition survey completed on it prior to demolition.

7 Remediation Criteria

The specific criteria referenced in this report have been selected in accordance with the NES and the MfE Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values.

Contaminant concentrations in soil were compared to human health criteria for residential land use 10% produce as this is the likely proposed land use of the site following redevelopment.

8 Soil Validation Results

Tables 4 – 8 below compare the soil contaminant concentrations in the sample tested with the adopted investigation criteria for residential 10% produce land use. Full analytical results are included in Appendix 3.

Area 1

An initial five soil samples were collected from Area 1, one from the base and one each from each wall with analysis for heavy metals. Three of the initial soil samples were reported above the site-specific regional background criteria for lead and / or zinc. It was recommended to undertake an additional scrape off the north, south, and western wall. The three additional validation soil samples reported concentrations below the background criteria and below the relevant NES land use criteria. No further remediation was required.

Table 4: Area 1 Validation Sample Analysis

Sample Name	A1 VS1	A1 VS2	A1 VS3	A1 VS4	A1 VS5	A1 VS6	A1 VS7	A1 VS8	Human Health Criteria – Residential Land Use – 10% produce	Human Health Criteria - Commercial / Industrial Outdoor Worker (Unpaved)[a]	Regional Background - Trace Elements (Level 2)[b]
Date	27 May 2024					7 June 2024					
Soil Type	Silt - Topsoil										
Location	Area 1 – Former shed										
Sample Depth, m	0.2	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.3	0.0-0.3			
Heavy Metals in soil, mg/kg											
Arsenic	4	5	4	7	5	3	3	4	20	70	12.58
Cadmium[c]	< 0.10	0.13	0.13	0.19	0.14	< 0.10	< 0.10	< 0.10	3	1,300	0.19
Chromium[d]	13	12	12	14	12	11	11	12	460	6,300	22.7
Copper	5	8	7	13	8	5	6	7	> 10,000	> 10,000	20.3
Lead	13.9	37	27	99	28	16.1	28	24	210	3,300	40.96
Nickel	8	8	8	8	7	7	7	7	400[c]	6,000[c]	20.7
Zinc	61	110	91	157	121	59	78	86	7,400[c]	400,000[c]	93.94

[a] Human health criteria from the NES except where noted.

Bold text indicates that the concentration exceeds the Residential land use criterion.

[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Exceedances are shaded.

[c] Assumes soil pH of 5.

[d] Criteria for chromium were conservatively selected.

Area 2

An initial 11 soil samples were collected from around Area 2 in the former glasshouse. Five samples were collected from the base of the remedial area and six from the excavation walls with analysis for heavy metals. One sample, A2 VS10, reported concentrations of arsenic above the NES residential land use criteria. Three samples were also reported above the background concentrations for arsenic. It was recommended to undertake further remediation of the three areas around these samples. Four additional samples were collected after the second remedial excavation was completed. All four samples were reported below the applicable NES residential land use criteria and below the background concentrations. No further remediation was required.

Table 5: Area 2 Validation Sample Analysis

Sample Name	A2 VS1	A2 VS2	A2 VS3	A2 VS4	A2 VS5	A2 VS6	A2 SV7	A2 VS8	Human Health Criteria – Residential Land Use – 10 % produce	Human Health Criteria - Commercial / Industrial Outdoor Worker (Unpaved)[a]	Regional Background - Trace Elements (Level 2)[b]
Date	27 May 2024										
Soil Type	Silt - Topsoil										
Location	Area 2 – former glasshouse										
Sample Depth, m	0.3	0.3	0.3	0.3	0.3	0.0-0.3	0.0-0.3	0.0-0.2			
Heavy Metals in soil, mg/kg											
Arsenic	3	4	4	5	5	4	10	14	20	70	12.58
Cadmium[c]	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3	1,300	0.19
Chromium[d]	10	12	13	14	14	14	12	14	460	6,300	22.7
Copper	3	4	4	5	5	5	5	5	> 10,000	> 10,000	20.3
Lead	10.5	10.2	13.3	15.5	14	15.9	15.6	12.2	210	3,300	40.96
Nickel	7	8	9	10	10	11	8	11	400[c]	6,000[c]	20.7
Zinc	40	41	56	62	63	75	68	44	7,400[c]	400,000[c]	93.94

[a] Human health criteria from the NES except where noted.

Bold text indicates that the concentration exceeds the Residential land use criterion.

[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Exceedances are shaded.

[c] Assumes soil pH of 5.

[d] Criteria for chromium were conservatively selected.

Table 6: Area 2 Validation Sample Analysis

Sample Name	A2 VS9	A2 VS10	A2 VS11	A2 VS12	A2 VS13	A2 VS14	A2 VS15	Human Health Criteria – Residential Land Use – 10% produce	Human Health Criteria - Commercial / Industrial Outdoor Worker (Unpaved)[a]	Regional Background - Trace Elements (Level 2)[b]
Date	27 May 2024			7 June 2024						
Soil Type	Silt – topsoil									
Location	Area 2 – former glass house									
Sample Depth, m	0.0-0.2	0.3	0.3	0.5	0.5	0.0-0.3	0.0-0.3			
Heavy Metals in soil, mg/kg										
Arsenic	18	**23**	8	4	4	5	4	20	70	12.58
Cadmium[c]	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3	1,300	0.19
Chromium[d]	13	13	13	14	14	12	13	460	6,300	22.7
Copper	10	6	5	4	4	5	5	> 10,000	> 10,000	20.3
Lead	18.5	13.9	15.2	15.4	12.6	12.8	14	210	3,300	40.96
Nickel	8	8	9	10	9	11	11	400[c]	6,000[c]	20.7
Zinc	75	64	58	54	50	37	37	7,400[c]	400,000[c]	93.94

[a] Human health criteria from the NES except where noted.

Bold text indicates that the concentration exceeds the Residential land use criterion.

[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Exceedances are shaded.

[c] Assumes soil pH of 5.

Area 3

An initial five samples were collected from across remedial Area 3, former animal pen area with analysis for lead only. Samples were collected from the base of the grid and one from each wall of the excavation. All five samples were reported below the applicable NES land use criteria. Four samples were reported above the background values for the site. It was recommended that additional excavations were completed on the walls of the grid to try and remove the remaining contamination. An additional three samples were collected after additional remedial excavations. Two of the samples were still reported above the background values, however at much lower concentrations, 60 mg/kg and 44 mg/kg with the background value at 40.96 mg/kg. No further remediation is required.

Table 7: Area 3 Validation Sample Analysis

Sample Name	A3 VS1	A3 VS2	A3 VS3	A3 VS4	A3 VS5	A3 VS6	A3 VS7	A3 VS8	Human Health Criteria – Residential Land Use – 10% produce	Human Health Criteria - Commercial / Industrial Outdoor Worker (Unpaved)[a]	Regional Background - Trace Elements (Level 2)[b]
Date	27 May 2024					7 June 2024					
Soil Type	Silt – topsoil										
Location	Area 3 – former animal pen										
Sample Depth, m	0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3			
Heavy Metals in soil, mg/kg											
Lead	13.4	51	63	199	188	28	60	44	210	3,300	40.96

[a] Human health criteria from the NES except where noted.

Bold text indicates that the concentration exceeds the Residential land use criterion.

[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Exceedances are shaded.

[c] Assumes soil pH of 5.

[d] Criteria for chromium were conservatively selected.

Area 4

The remedial contractor initial only undertook a 200 mm remedial excavation under the burn pile. Two initial soil samples were collected after the first excavation with analysis for heavy metals. Both samples reported arsenic above the NES residential land use criteria. The two initial samples were also reported at much lower concentrations, it was determined that the remaining soil was suitable for disposal to Frews Hororata. An additional excavation was undertaken across the entire remedial area with an additional 100 mm excavation. Five additional soil samples were collected, one from the base and one each from each wall. All five samples were reported below the NES residential land use criteria and below the site-specific regional background levels. No further remediation was required.

Table 8: Area 1 Validation Sample Analysis

Sample Name	A4 VS1	A4 VS2	A4 VS3	A4 VS4	A4 VS5	A4 VS6	A4 VS7	Duplicate (A4 VS3)	Human Health Criteria – Residential Land Use – 10% produce	Human Health Criteria - Commercial / Industrial Outdoor Worker (Unpaved)[a]	Regional Background - Trace Elements (Level 2)[b]
Date	27 May 2024		7 June 2024								
Soil Type	Silt – topsoil										
Location	Area 4 – burn pile										
Sample Depth, m	0.2	0.2	0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3			
Heavy Metals in soil, mg/kg											
Arsenic	**30**	**30**	5	5	4	7	7	9	20	70	12.58
Cadmium[c]	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3	1,300	0.19
Chromium[d]	26	13	16	12	12	13	13	20	460	6,300	22.7
Copper	5	8	5	5	5	5	5	6	> 10,000	> 10,000	20.3
Lead	13.5	20	13.4	14.8	15.1	13.9	14	14.4	210	3,300	40.96
Nickel	9	9	12	8	8	9	9	12	400[c]	6,000[c]	20.7
Zinc	48	58	46	50	53	57	55	48	7,400[c]	400,000[c]	93.94

[a] Human health criteria from the NES except where noted.

Bold text indicates that the concentration exceeds the Residential land use criterion.

[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Exceedances are shaded.

[c] Assumes soil pH of 5.

[d] Criteria for chromium were conservatively selected.

9 Conceptual Site Model

A conceptual site model consists of four primary components. For contaminants to present a risk to human health or an environmental receptor, all four components are required to be present and connected. The four components of a conceptual site model are:

- Source of contamination;
- Pathway(s) in which contamination could potentially mobilise along (e.g., vapour or groundwater migration);
- Sensitive receptor(s) which may be exposed to the contaminants; and
- An exposure route, where the sensitive receptors and contaminants come into contact (e.g., ingestion, inhalation, dermal contact).

The potential source, pathway, receptor linkages at this subject site are provided in Table 9.

Table 9: Conceptual Site Model

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk?
Area 1 – Former shed	Heavy metals	Dermal contact with impacted soil, inhalation of dust and incidental ingestion during earthworks and long-term use of the site. Groundwater migration.	Redevelopment workers Future subsurface maintenance workers Future site users Surrounding environment	**Likely,** Heavy metals present below land use criteria.
Area 2 – Former glasshouse	Asbestos	Dermal contact with impacted soil, inhalation of dust and incidental ingestion during earthworks and long-term use of the site. Groundwater migration.	Redevelopment workers Future subsurface maintenance workers Future site users	**Likely,** Heavy metals present below land use criteria.
Area 3 – Former animal pen	Lead	Dermal contact with impacted soil, inhalation of dust and incidental ingestion during earthworks and long-term use of the site. Groundwater migration.	Redevelopment workers Future subsurface maintenance workers Future site users Surrounding environment	**Likely,** Lead present below land use criteria.

Area 4 – burn pit	Heavy metals	Dermal contact with impacted soil, inhalation of dust and incidental ingestion during earthworks and long-term use of the site. Groundwater migration.	Redevelopment workers Future subsurface maintenance workers Future site users Surrounding environment	**Likely,** Heavy metals present below land use criteria.

10 Conclusions

Following the completion of remedial works described in ENGEO's Remedial Action Plan (RAP), ENGEO was engaged by Urban Estates Limited to complete a site validation and reporting to determine if the site is suitable for the proposed residential land use (10% produce consumption).

A total of 38 validation soil samples were collected from across the four validation areas. The validation samples were analysed for contaminants of concern associated with the former land uses that were previously identified as being above the proposed land use guideline criteria.

The material from across the four remedial areas were all decided to be remediated through excavation and off-site disposal to an appropriate landfill facility.

During the validation sampling, some of the areas reported concentrations of contaminants above the NES residential (10% produce) land use criteria or in exceedances of the background concentrations, therefore additional excavations were completed in these areas. The final validation results indicate that the soils left within the remedial areas are suitable for the proposed end land use. Therefore, due to the concentrations of contaminants of concern below the adopted land use, it is considered that the site has been suitably remediated and considered suitable for the development. Some concentrations of heavy metals were identified in the remedial areas marginally above the site-specific regional background levels, and are considered to be a low risk to human health and the surrounding environment.

Received disposal documentation indicates a total of 154.4 tonnes of material was disposed of off-site. Initial soils excavated from Area 4 were disposed of to Enviro NZ which totalled 43.48 tonnes. The remainder of the contaminated soil was excavated and disposed of to Frews Hororata.

Area 1 – 4

Based on our investigation, aforementioned documents, and laboratory analysis results, further remediation of the identified areas of concern are not considered to be required, and the site is therefore deemed suitable for the intended residential land use.

Area 5

Area 5 around the dwelling still requires remediation. This will be completed at a later stage of the development works.

In relation to the Selwyn District Council consent conditions outlined in Section 1.2, it is considered that the remedial works are completed in general accordance with the conditions.

It is recommended that the remainder of the site redevelopment work is completed under a contractor earthworks plan that provides contingency measures should additional areas of concern be identified during any soil disturbance works.

11 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Urban Estates Limited, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

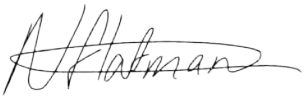
iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by



Natalie Flatman, CEnvP

Environmental Scientist

Report reviewed by

Dave Robotham, CEnvP SC

Principal Environmental Consultant

12 References

ECan (2007a). *Background Concentrations of Selected Trace Elements in Canterbury Soils. Addendum 1: Additional Samples and Timaru Specific Background Levels.* Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number R07/1/2. Tonkin & Taylor Reference: 50875.003.

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

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MfE (2021a). *Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites*.

MfE (2021b). *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*.

FIGURES

Legend

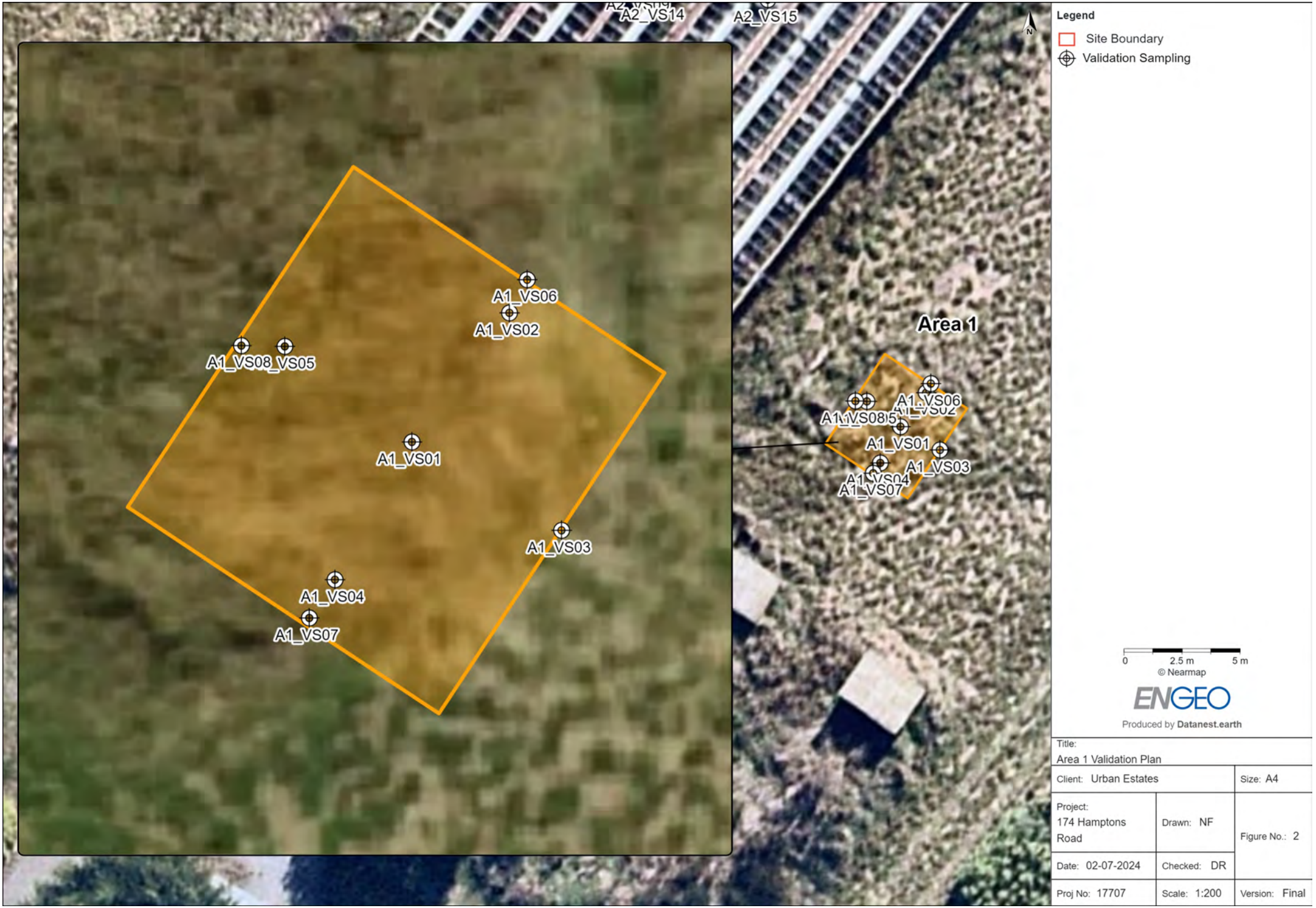
- Site Boundary
- Remedial Areas

0 10 m 20 m

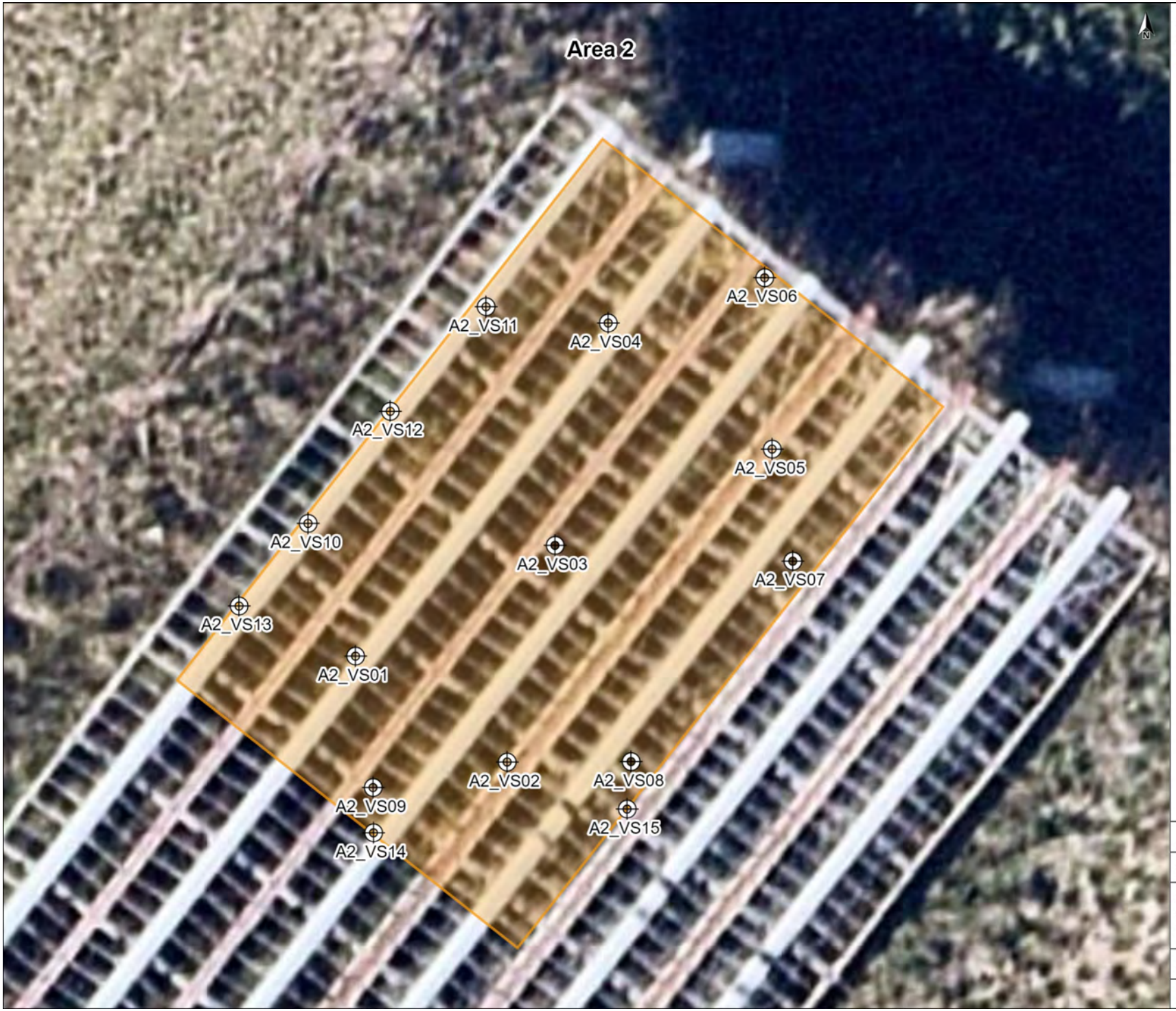
ENGEO

Produced by **Datanest.earth**

Title: Remedial Areas - Overview		
Client: Urban Estates		Size: A4
Project: 174 Hamptons Road	Drawn: NF	Figure No.: 1
Date: 01-06-2023	Checked: DR	
Proj No: 17707	Scale: 1:1000	Version: Final



Title: Area 1 Validation Plan		
Client: Urban Estates		Size: A4
Project: 174 Hamptons Road	Drawn: NF	Figure No.: 2
Date: 02-07-2024	Checked: DR	
Proj No: 17707	Scale: 1:200	Version: Final



Legend

- Validation Sampling
- Remedial Areas

0 2.5 m 5 m

© Nearmap

ENGEO

Produced by **Datanest.earth**

Title: Area 2 Validation Plan		
Client: Urban Estates		Size: A4
Project: 174 Hamptons Road	Drawn: NF	Figure No.: 3
Date: 02-07-2024	Checked: DR	
Proj No: 17707	Scale: 1:125	Version: Final

Legend

- Validation Sampling
- Remedial Areas

0 1 m 2 m

ENGEO

Produced by **Datanest.earth**

Title: Area 3 Validation Plan		
Client: Urban Estates		Size: A4
Project: 174 Hamptons Road	Drawn: NF	Figure No.: 4
Date: 02-07-2024	Checked: DR	
Proj No: 17707	Scale: 1:100	Version: Final

Legend

- Validation Sampling
- Remedial Areas

0 1 m 2 m

ENGEO

Produced by **Datanest.earth**

Title: Area 4 Validation Plan		
Client: Urban Estates		Size: A4
Project: 174 Hamptons Road	Drawn: NF	Figure No.: 5
Date: 02-07-2024	Checked: DR	
Proj No: 17707	Scale: 1:100	Version: Final

APPENDIX 1:

Waste Dockets

Inwards Goods Form

Account:	☑	Cash Sale:	☐

Company Name: Frews	Enviro NZ Work Order:
Customer Name:	
Phone:	Date Received: 28/05/24.
Purchase Order: 20896.	Weighed By:
Customer Email:	

№	Type	Waste Description	Weight	Class
		- Dirty Soil.		

Enviro NZ
10 Barton St
Woolston, Christchurch
03 384 0318

5/28/2024 2:04:07 PM
Progressive 4756
Mpp code 2344
Data recall.....4694

1.Weight IN 27680 kg

Vehicle Registration

Enviro NZ
10 Barton St
Woolston, Christchurch
03 384 0318

5/28/2024 2:40:13 PM
Progressive 4757
Mpp code 2345
Data recall.....4695

1.Weight IN 15800 kg

Vehicle Registration

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : C37719

Vehicle : FRE697 - FREWS

Charge To : FREWCO - FREWS

Product : MIXED C&D/WASTE (TN)

Order : 20466 - URBAN ESTATES

Notes : 174 HAMPTONS RD (ACX)

Tare **: 16.9 9:00:58 AM 30-May**

Gross **: 20.42 9:00:58 AM 30-May**

Net **: 3.52**

Delivery : Supply Only

Printed : 9:00:58 AM 30/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : C37622

Vehicle : FRE697 - FREWS

Charge To : FREWCO - FREWS

Product : MIXED C&D/WASTE (TN)

Order : 20466 - URBAN ESTATES

Notes : 174 HAMPTONS RD (ACX)

Tare **: 16.26 2:30:47 PM 23-May**

Gross **: 20.04 2:30:47 PM 23-May**

Net **: 3.78**

Delivery : Supply Only

Printed : 2:30:47 PM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : C37529

Vehicle : FRE665 - FREWS

Charge To : FREWCO - FREWS

Product : MIXED C&D/WASTE (TN)

Order : 20466 - URBAN ESTATES

Notes : 174 HAMPTONS RD (ACX)

Tare **: 15.96 9:29:45 AM 17-May**

Gross **: 20.72 9:29:46 AM 17-May**

Net **: 4.76**

Delivery : Supply Only

Printed : 9:29:46 AM 17/05/2024

Signature:

PH: 03 348 8567

trish@frews.co.nz

www.frews.co.nz

WAYNE B

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36631

Vehicle : FRE726 - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 15.5 9:57:00 AM 23-May**

Gross **: 29 9:57:46 AM 23-May**

Net **: 13.5**

Delivery : Supply Only

Printed : 9:57:46 AM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36632

Vehicle : FRE726 - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 9 9:57:58 AM 23-May**

Gross **: 22.58 10:03:05 AM 23-May**

Net **: 13.58**

Delivery : Supply Only

Printed : 10:03:05 AM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36635

Vehicle : FRE608 - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 10.04 11:30:39 AM 23-May**

Gross **: 18.06 11:38:57 AM 23-May**

Net **: 8.02**

Delivery : Supply Only

Printed : 11:38:57 AM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36638

Vehicle : FRE721TT - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 24.52 12:40:04 PM 23-May**

Gross **: 45.48 12:42:12 PM 23-May**

Net **: 20.96**

Delivery : Supply Only

Printed : 12:42:12 PM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36646

Vehicle : FRE726T - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 25.2 1:56:23 PM 23-May**

Gross **: 50.7 1:56:53 PM 23-May**

Net **: 25.5**

Delivery : Supply Only

Printed : 1:56:53 PM 23/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P36654

Vehicle : FRE726T - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 25.2 7:09:33 AM 24-May**

Gross **: 46.28 7:10:27 AM 24-May**

Net **: 21.08**

Delivery : Supply Only

Printed : 7:10:27 AM 24/05/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

Frews Quarries Ltd

Plantation Road, Hororata, Christchurch

GST: 113 453 222

Docket No : P37016

Vehicle : FRE726T - FREWS

Charge To : FREWCO - FREWS

Product : SPECIAL WASTE LOWER

Order : 2107 - 174 HAMPTONS ROAD,

Notes : DRIVE SAFE

Tare **: 24 11:25:35 AM 10-Jun**

Gross **: 50.56 11:26:07 AM 10-Jun**

Net **: 26.56**

Delivery : Supply Only

Printed : 11:26:07 AM 10/06/2024

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

APPENDIX 2:

Demolition Survey

URBAN ESTATES

Asbestos Demolition Survey

Urban Estates Limited
174 Hamptons Road - Outbuildings
174 Hamptons Road, Prebbleton, 7676

Surveyed on 21 May, 2024
Report Version 1, 24 May, 2024

ENGEO

Table of Contents

ENGEO

Document Control

Survey Type		Demolition	
Survey Location		174 Hamptons Road, Prebbleton, 7676	
Survey Date		21/05/2024	
Report Version		1, 24/05/24	
Project Number		17707.000.001	
Client	Urban Estates Limited	Client Contact	Brad Wilson Phone: Email: brad@wilsonbuilt.co.nz
Client Address		Level 2, Building One, 181 High Street, Christchurch, 8144	

Surveyed By

Ethan Collier
Licensed Asbestos Assessor
AA24040014, BSc, BOHS I402

Josh Green
Environmental Scientist

Reviewed By

Natalie Flatman
Licensed Asbestos Assessor
IP402, Asbestos Assessor

1. Executive Summary

Asbestos containing materials (ACM) have not been identified during this Demolition Survey. In situations where ACM's are identified they are listed in the tables below and categorized according to the risk assessment completed during the survey. The risk assessment considers the hazard the ACM itself presents . The risk assessment scores generated are combined to form a total risk assessment score. The results of the assessment indicate the priority for action as well as the risk from the material. As no ACM's or inaccessible areas have been identified there are no specific management requirements of the surveyed materials.

Asbestos demolition survey of four outbuildings located at 174 Hamptons Road. The power was turned off and the buildings were unoccupied at the time of the survey. Please note that the dwelling was out of scope for this survey and will require an asbestos demolition survey to be completed at a later date prior to refurbishment or demolition works.

1.1 High Risk Materials

No high risk items recorded.

1.2 Medium Risk Materials

No medium risk items recorded.

1.3 Low Risk Materials

No low risk items recorded.

1.4 Inaccessible areas presumed to contain asbestos

No Inaccessible areas recorded.

1.5 Building Notes

The following interior and exterior building items observed during the survey have been summarised below;

Interior Notes
Concrete, timber and gravel floors. Corrugated metal, concrete and brick walls. Corrugated metal and timber ceilings throughout buildings.
Exterior Notes
Concrete slab foundations and timber. Exterior concrete block and brick walls. Corrugated metal cladding and roof.

1.6 Out of Scope

No rooms are recorded as being out of scope.

2. Introduction

ENGEO were engaged by Urban Estates Limited to undertake an Asbestos Demolition Survey survey of interior and exterior of 174 Hamptons Road - Outbuildings located at 174 Hamptons Road.

An asbestos demolition survey was completed to assist Urban Estates Limited with meeting their requirements under the Health and Safety at Work (Asbestos) Regulations 2016. The information included in this survey should be used by Urban Estates Limited to manage demolition work at the site and if applicable create a management plan in accordance with the regulations.

This survey was led by Ethan Collier AA24040014, BSc, BOHS I402 on 21 May, 2024 and undertaken in accordance with ENGEO technical procedures, which are based on the Health and Safety at Work (Asbestos) Regulations 2016 and Good Practice Guidelines: Conducting Asbestos Surveys (Worksafe, 2017). A summary of the survey methodology is included in Appendix 1.

This survey report is organised into the following sections:

- **Identified asbestos containing materials** - Section 4 of the report identifies where positive asbestos containing materials have been identified or presumed/strongly presumed to be present;
- **Non-asbestos containing materials** - Appendix 2 highlights materials which have been sampled but did not contain asbestos;
- **Survey Summary** - Appendix 3 provides a summary of each room surveyed within the building, including the room notes. Where a room indicates no Visible PACM observed, PACM may be present within or below the building materials on the surface and this should be taken into account when undertaking intrusive work;
- **Asbestos Register** - Appendix 4 provides a complete register of all asbestos items identified within this survey.

2.1 Asbestos Demolition Survey

2.1.1 Survey Type & Extent

The purpose of an asbestos demolition survey is to help Urban Estates Limited locate all the asbestos in a workplace (or the relevant part) before work commences. Refurbishment and demolition surveys are technically more challenging than management surveys, as their purpose is to identify all ACM within a particular building area or within the whole premises, so this can be removed.

The Asbestos Regulations require all asbestos likely to be disturbed by refurbishment or demolition work to be removed, so far as is reasonably practicable, before the work commences.

The survey information may be used to help in the tendering process for removing asbestos and ACM from the building before the work starts. Urban Estates Limited should supply the survey report to designers and contractors who may be tendering for the work, so they can address the asbestos risks. If the asbestos is being identified so it can be removed, the survey does not normally assess the condition of the asbestos, other than to indicate areas of damage or where additional asbestos debris may be present. If the asbestos removal may not take place for some time, the ACM's condition will need to be assessed and managed.

2.1.2 Survey Objective

The aim of this demolition survey is to;

1. Locate and record the location, extent, and product type as far as reasonably practicable of known or presumed ACM's.
2. Inspect and record information on the accessibility, condition and surface treatment of known or presumed ACM's.
3. Determine and record the asbestos type based on sampling or making presumption based on others present, the product type and/or its appearance.

2.1.3 Management Plan Requirement

If an asbestos material is not being removed or the demolition will not occur within 3 months of receiving this report, Urban Estates Limited should use the information contained within this survey to create a management plan which is compliant with the Asbestos Regulations and ACOP. The management plan must include, amongst other things, a risk assessment of materials, controls for asbestos items, emergency response plans, key contact for emergency, a method for identifying asbestos, communication plan to all employees and contractors and a register of workers who may undertake asbestos related work.

This report provides information on asbestos containing materials identified within the premises, so that the Urban Estates Limited can carry out a risk assessment and prepare a suitable management plan in accordance with the Asbestos Regulations 2016 and as outlined in the ACOP (2016)

3. Survey Methodology

3.1 Sampling and Analysis

The objective of bulk sampling is to confirm if asbestos is present within the suspected material. Once confirmed, the nature and extent of identified asbestos containing material or asbestos containing dust can be made.

Bulk sampling was undertaken in accordance with recognised safe procedures where safe to do so and where required. Where possible, sampling was undertaken when a room was unoccupied to minimise the risk of inhalation of airborne asbestos fibres and so not to disturb the occupants. Bulk samples were taken in accordance with documented ENGEO technical procedures, following guidelines detailed in 'Good Practice Guidelines: Conducting Asbestos Surveys' (October 2016). Materials that are 'strongly presumed' appeared to be visually similar to materials that had already been sampled. These materials are recorded in the comments section of the survey data sheets and referenced against the original sampled material.

Bulk samples were collected by the survey team under controlled conditions and placed in labelled zip lock bags. Samples were placed inside a lockable container and submitted under a chain of custody to the appointed laboratory. The sample bags indicate the site identification, sample number, material type and the time and date taken, so it can be cross referenced to this report and its location identified.

Bulk sample analysis was carried out at an IANZ accredited laboratory, in accordance with AS 4964-2004 'Method for the qualitative identification of asbestos in bulk samples'. Samples were examined under a low magnification stereomicroscope and polarised light microscopy and dispersion staining in accordance with the aforementioned method.

The laboratory report summarising the bulk sample analysis is included in Appendix 5.

3.2 Risk Assessment Methodology

Asbestos containing materials (ACM) have been identified during the Demolition Survey, the risk associated with each material has been developed using the United Kingdom Health and Safety Executive (HSE) asbestos risk assessment algorithms.

The risk assessment algorithm takes into account the risk from the material itself. This will include the material type, condition, surface treatment, and asbestos type.. The score generated from the material is then added to a secondary score which takes into account the occupancy of the building and the potential for disturbance of the ACM.

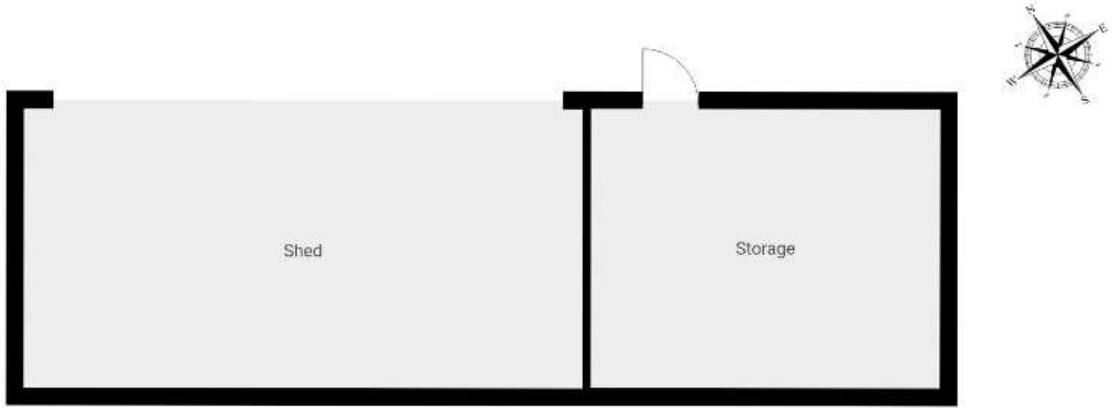
The total risk assessment score generated from the combined scores indicates the priority for management and remedial actions. Whilst this survey report recommends various management techniques these could be reviewed and reassessed during production of the asbestos management plan.

The algorithm used to calculate the risk ratings are included in Appendix 6.

4. Identified Asbestos Materials

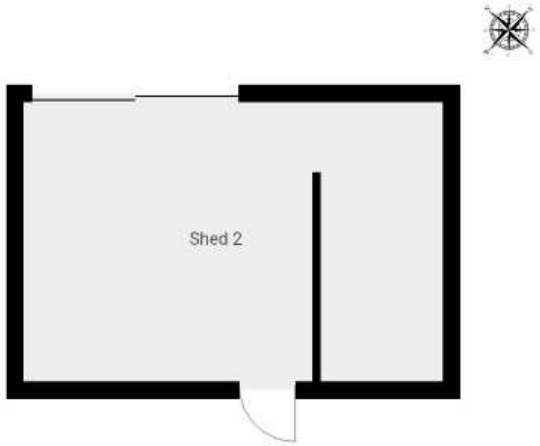
No asbestos materials were identified or presumed during this survey.

Shed 1



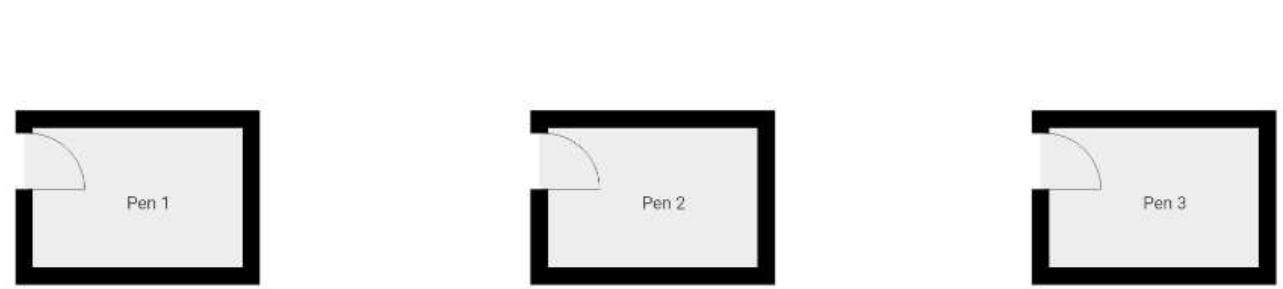
Key:	Positive Asbestos Material:	Inaccessible Area/Item:	Out of Scope:	No PACM Observed:

Shed 2



Key: Positive Asbestos Material: Inaccessible Area/Item: Out of Scope: No PACM Observed:

Pig Pens



Key: Positive Asbestos Material: Inaccessible Area/Item: Out of Scope: No PACM Observed:

5. Recommendations

To assist with compliance with the 'New Zealand Health and Safety at Work (Asbestos) Regulations 2016', and the 'Health and Safety at Work Act 2015', the following are recommended;

- All information included in this survey report should be reviewed by the applicable building PCBUs;
- If demolition is not completed within a reasonable timeframe, all identified asbestos is to be physically reviewed regularly and the risk assessment updated and revised as necessary;
- The information within this survey report details the risk presented by asbestos material and highlights generic asbestos management options available to eliminate or minimise the potential for exposure to asbestos of the building occupants;
- During the course of the survey it may not have been possible to access all areas of the site. Details of areas requiring further access are identified within the Data Sheets of this report. In accordance with WorkSafe (October 2016) Guidelines, asbestos has been presumed to be present within these areas and should be treated accordingly until further inspection and analysis of building fabric proves otherwise;
- Where 'Unidentified Mineral Fibre' is reported, this material must be presumed to be an amosite asbestos fibre type, and treated as such, until further analysis either confirms or refutes the presumption;
- The findings of this report should not be solely relied upon in obtaining costs for proposed asbestos abatement work. Any proposed abatement/removal of the asbestos should be undertaken against a detailed specification;
- The workplace PCBU has a duty to ensure that exposure of a person at the workplace to airborne asbestos is eliminated so far as is reasonably practicable; and if it is not reasonably practicable to eliminate exposure to airborne asbestos, exposure is minimised so far as is reasonably practicable. For materials which have been identified as being in poor condition air monitoring should be undertaken to identify whether the airborne contamination standard for asbestos is exceeded at the workplace;
- The workplace PCBU has a responsibility to indicate the presence of asbestos within the building, this may include:
    - Placing colour-coded labels on ACM (if it is safe to do so) and informing all workers of the presence of these labels and their meaning;
    - Placing a sign at the entrance to the workplace or the work area containing asbestos materials;
    - Identifying its presence and location on site plans, making them accessible to all workers, and making sure workers are aware of the presence, meaning and purpose of the plans.

6. Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Urban Estates Limited, professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
ii. The management and staff of ENGEO have taken every feasible action to ensure that the quality and integrity of this report is true to type. The information and knowledge in this report should not be relied upon in its entirety. Any commercial decisions made should be done in consultation with other documentation, and advice not solely from this document.
iii. ENGEO will provide written recommendation pursuant to engaged services, however at all times prior, during and following this is in good faith, as such ENGEO servants, employees and agents are not subject to liability whatsoever (whether by reason of lack of due care and attention or otherwise) and the client releases and discharges ENGEO and its servants, agents or employees from all actions, suits claims, demands, causes of actions, costs and expenses, legal equitable under statute and otherwise and all other liabilities of any nature (whether or not the parties were or could have been aware of them) which the client may have; or but for this disclaimer, could or might have had against ENGEO and its servants, agents or employees in any way related to the information provided, or the circumstances recited in this disclaimer or allegations arising out of or in any way related to the information provided, or the circumstances recited in this disclaimer or allegations arising out of, or in any way related to the information provided to the client of ENGEO.
iv. This report relates only to the identification of asbestos containing materials (ACM) used in the construction of the property and does not include the identification of dangerous goods, or hazardous substances in the form of chemicals used, stored or manufactured with the property or plant.
v. This report is not to be used for contractual purposes unless the front signatory sheet is signed where indicated by both the person conducting the survey and the report approver.
vi. All measurements detailing the extent of materials are estimates only. It is the responsibility of contractors quoting for any refurbishment or removal works to take their own measurements to establish the precise extent of the works prior to tendering.
vii. This report shall not be reproduced without full written approval of ENGEO.
viii. For safety reasons it is not possible to inspect internal areas of plant, machinery, building materials and/or structure.
ix. Where areas have been designated as 'no access' or 'restricted access', unless further inspection/sampling proves otherwise, the presumption has been made that these structures/areas contain ACM's.
x. During the course of the survey it may not have been possible to access all areas of the site. Details of areas requiring further access are identified within the Data Sheets of this report. In accordance with 'Good Practice Guidelines', asbestos is presumed to be present within these areas and should be treated accordingly until further inspection and analysis of building fabric and services proves otherwise.
xi. Residual asbestos material may be present beneath re-lagged services and cannot be detected unless the re-lagging is systematically removed. Caution should therefore be taken when working on such materials for the potential presence of asbestos residue.
xii. Jointing compound and textured coatings such as "Stipple" may contain a trace quantity of Chrysotile asbestos. Due to this low asbestos content, applications of this product may be non-homogenous and may elicit both positive and negative samples. Where both positive and negative samples are obtained from the same area, the client should presume that the jointing compound and textured coatings contains Chrysotile throughout even though a non-detected result has been obtained.
xiii. This report does not include investigations into land contamination associated with asbestos or any other contaminant
xiv. Access behind or above known ACMs were not assessed within the survey to reduce the risk of airborne contamination.

Appendix 1
Survey Methodology

- This survey has been undertaken in general accordance with 'Good Practice Guidelines: Conducting Asbestos Surveys' (October 2016) and ENGEO technical procedures.
- Clients of ENGEO that have signed our terms and conditions are deemed to have agreed, and accepted, our surveying approach, our sampling strategy, and our standard planning, surveying and reporting format unless they have made specific requests to the contrary.
- The information provided by the client or their representative are recorded in the planning document and have been used to define the scope of the survey.
- Photographs of suspected ACM's were taken at the time of the survey unless the client expressly requested otherwise. Sampling points and suspected ACM's have not been identified with labels unless the client expressly requested otherwise.
- Fibrous materials and items have been included in the survey unless, in the surveyor's professional opinion, these items can be excluded (e.g. Wood, wallpaper, man-made mineral fibre). Samples of thermoplastic floor coverings were taken unless, in the surveyor's professional opinion, such items can be excluded. Textured coatings and novel bituminous were sampled.
- Areas that could not be accessed were presumed to have ACM's present until proven otherwise. Each area requiring further inspection is documented within the Executive summary (Inaccessible areas).
- Materials that could not be accessed and in the surveyor's opinion cannot be dismissed will be presumed to be ACM unless proven otherwise. Materials that are not sampled but, in the surveyor's opinion, fall under one of the following categories will be strongly presumed to be similar to the sampled material;
  (1) lab analysis has confirmed the presence of asbestos in a similar construction material,
  (2) asbestos is known to have been commonly used in the material at the time of installation,
  (3) the material has the appearance of asbestos, or
  (4) the material has a similar appearance, location, and function as a previously sampled material.
- The quantity of samples taken may have been minimized by using 'strongly presumed' as defined above.
- Intrusive damage that is required to gain access to an area/location, that is within the scope of the survey, has been agreed with the client or the client's representative. Any remedial action agreed was put in place before such action was attempted. If remedial action could not be arranged, no attempt to access the area was made and the reasons recorded. The area/location was presumed to have ACM's present until proven otherwise.
- Non-fibrous materials and items known not to contain asbestos (e.g. Breeze block, plaster, plasterboard plastics and non-textured paints) have been excluded from the survey unless the surveyor suspected that these materials have been contaminated with asbestos from other sources or specifically requested to be assessed by the client.
- Older electrical equipment, which cannot be shown to contain ACM's, have been presumed to have ACM's present unless, in the surveyor's professional opinion, such items could be excluded.

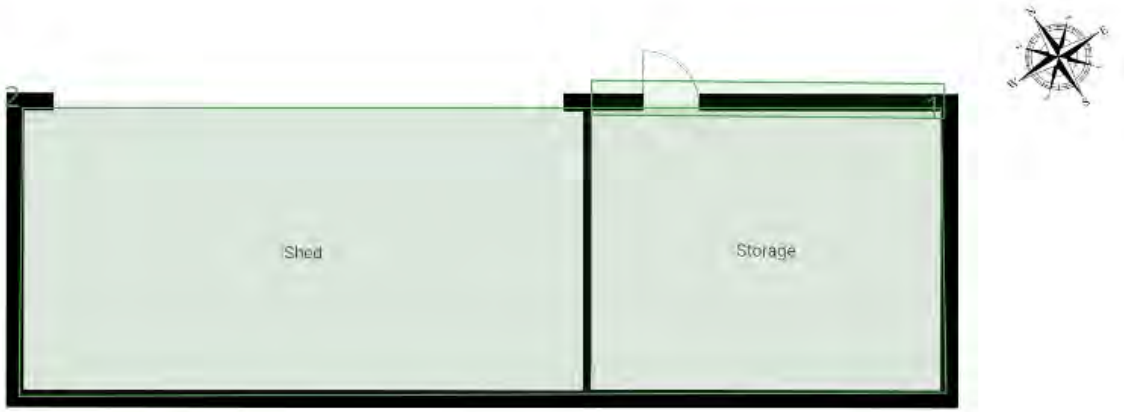
Appendix 2
Negative Survey Results

Negative Asbestos Materials

The following section details plans locating areas investigated which did not contain asbestos and survey data sheets detailing information on each item.

Shed 1

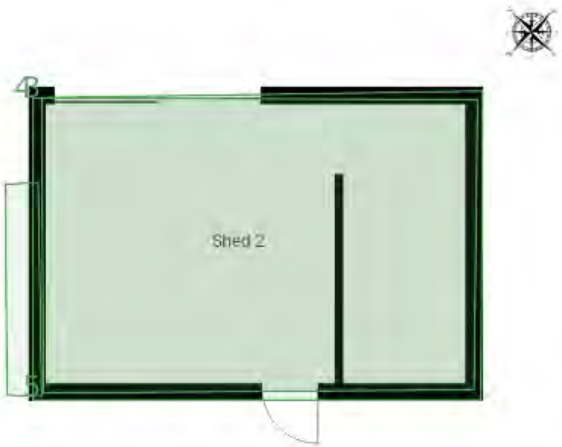
Sample #	Name
1	Window putty
2	Building paper



Key: Positive Asbestos Material: | Inaccessible Area/Item: | Negative Sample: | Out of Scope: | No PACM Observed:

Shed 2

Sample #	Name
3	Building paper
4	Bitumen D.P.C
5	Window putty



Key: Positive Asbestos Material: Inaccessible Area/Item: Negative Sample: Out of Scope: No PACM Observed:

Pig Pens

Sample #	Name
AS-6	Building paper
6	Building paper

Key: Positive Asbestos Material: Inaccessible Area/Item: Negative Sample: Out of Scope: No PACM Observed:

Item	Window putty
Product Type	Negative
Sample ID	1
Sample Type	Sampled
Location	Window putty around window frames
Room	Exterior
Floor	Shed 1
Building	174 Hamptons Road - Outbuildings
Amount	6 Linear metres
Friable?	Non-Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0

Recommendations

Location of Material on Plan

Item	Building paper
Product Type	Negative
Sample ID	2
Sample Type	Sampled
Location	Building paper on ceiling
Room	Interior
Floor	Shed 1
Building	174 Hamptons Road - Outbuildings
Amount	45 m^2
Friable?	Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan

Item	Building paper
Product Type	Negative
Sample ID	3
Sample Type	Sampled
Location	Building paper on ceiling
Room	Interior
Floor	Shed 2
Building	174 Hamptons Road - Outbuildings
Amount	30 m^2
Friable?	Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan

Item	Window putty
Product Type	Negative
Sample ID	5
Sample Type	Sampled
Location	Window putty around window frames
Room	Exterior
Floor	Shed 2
Building	174 Hamptons Road - Outbuildings
Amount	4 Linear metres
Friable?	Non-Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan

Item	Bitumen D.P.C
Product Type	Negative
Sample ID	4
Sample Type	Sampled
Location	Bitumen D.P.C between timber framing and concrete block walls.
Room	Interior
Floor	Shed 2
Building	174 Hamptons Road - Outbuildings
Amount	1 Unknown
Friable?	Non-Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan

Comments	Please note: The total amount of D.P.C is unknown. The D.P.C is presumed to be present were timber framing meets concrete.

Item	Building paper
Product Type	Negative
Sample ID	6
Sample Type	Sampled
Location	Building paper on ceiling
Room	Pig Pen 1 Interior
Floor	Pig Pens
Building	174 Hamptons Road - Outbuildings
Amount	10 m^2
Friable?	Friable

Sample Location Photograph

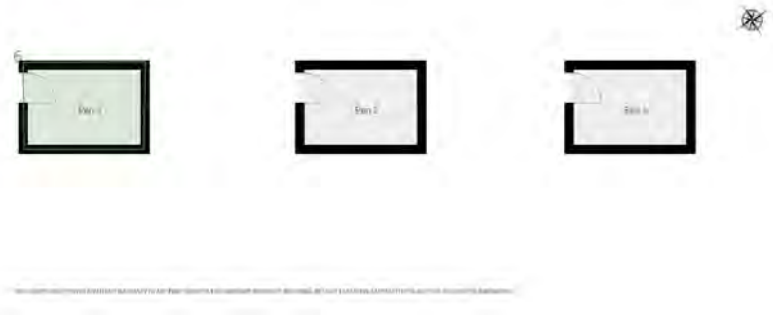
Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan



Item	Building paper
Product Type	Negative
Sample ID	AS-6
Sample Type	Sampled As
Location	Building paper on ceiling
Room	Pig Pen 2 Interior
Floor	Pig Pens
Building	174 Hamptons Road - Outbuildings
Amount	4 m^2
Friable?	Friable

Sample Location Photograph

Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan

Original sample location:

Item	Building paper
Product Type	Negative
Sample ID	AS-6
Sample Type	Sampled As
Location	Building paper on ceiling
Room	Pig Pen 3 Interior
Floor	Pig Pens
Building	174 Hamptons Road - Outbuildings
Amount	3 m^2
Friable?	Friable

Sample Location Photograph

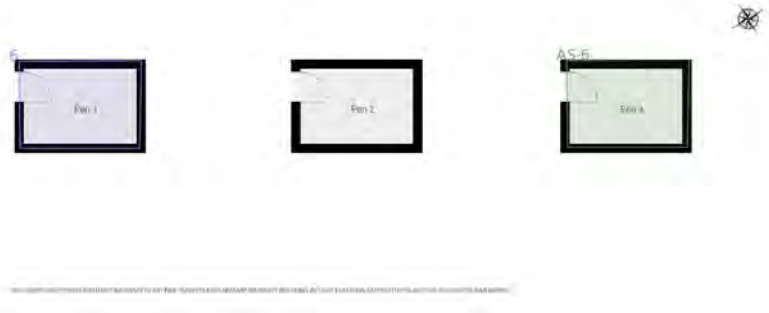
Material Risk Assessment

Product Type	Surface Treatment	Condition	Asbestos Type	Score
N/A	N/A	N/A	Negative (0)	N/A

Priority Risk Assessment

Occupancy Activity	Likelihood	Human Exposure	Maintenance	Score
0	0	0	0	
	0	0	0	
	0	0		
Average: 0	Average: 0	Average: 0	Average: 0	0
Risk Rating	Negative			0
Recommendations				

Location of Material on Plan



Original sample location:

Appendix 3
Room Notes

Building	Floor	Room Name	Room Notes
174 Hamptons Road - Outbuildings	Shed 1	Interior	Concrete floor. Timber framing to corrugated metal walls. Modern switchboard on plasterboard on timber framing. Timber framing below wire mesh below building paper below metal roof.
174 Hamptons Road - Outbuildings	Shed 1	Exterior	Concrete slab. Corrugated metal cladding and roof. Window putty around window frames.
174 Hamptons Road - Outbuildings	Shed 2	Interior	Concrete floor. Timber traming to corrugated meral walls. Concrete cinderblockwalls. Bitumen D.P.C. Timber framing below wire mesh below building paper below metal roof.
174 Hamptons Road - Outbuildings	Shed 2	Exterior	Concrete slab. Exterior brick and concrete block walls. Corrugated metal cladding and roof. Window party around window frames.
174 Hamptons Road - Outbuildings	Pig Pens	Pig Pen 1 Interior	Timber floor. Timber framing to metal walls. Building paper below timber framing below metal roof.
174 Hamptons Road - Outbuildings	Pig Pens	Pig pen Exteriors	Timber foundations. Metal Walls. Corrugated metal roofs.
174 Hamptons Road - Outbuildings	Pig Pens	Pig Pen 2 Interior	Timber floor. Timber framing to metal walls. Building paper below timber framing below metal roof.
174 Hamptons Road - Outbuildings	Pig Pens	Pig Pen 3 Interior	Timber floor. Timber framing to metal walls. Building paper below timber framing below metal roof.

Appendix 4
Survey Register

Building	Floor	Asbestos Type and Location	Sample ID	Condition	Surface Treatment	Asbestos Type	Amount	Accessibility	Material Score	Occupancy Score	Total risk rating	Recommendations
174 Hamptons Road - Outbuildings	Shed 1	Window putty around window frames	1	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Shed 1	Building paper on ceiling	2	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Shed 2	Building paper on ceiling	3	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Shed 2	Window putty around window frames	5	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Shed 2	Bitumen D.P.C between timber framing and concrete block walls.	4	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Pig Pens	Building paper on ceiling	6	N/A	N/A	Negative	N/A	N/A	0	0	0	
174 Hamptons Road - Outbuildings	Pig Pens	Building paper on ceiling	AS-6	N/A	N/A	Negative	N/A	N/A	0	0	0	

Building	Floor	Asbestos Type and Location	Sample ID	Condition	Surface Treatment	Asbestos Type	Amount	Accessibility	Material Score	Occupancy Score	Total risk rating	Recommendations
174 Hamptons Road - Outbuildings	Pig Pens	Building paper on ceiling	AS-6	N/A	N/A	Negative	N/A	N/A	0	0	0	

Appendix 5
Chain Of Custody

Hill Laboratories (Christchurch)
1/17 Print Place, Middleton, Christchurch, 8024

Chain Of Custody		
Company Name	ENGEO	Email Results To ecollier@engeo.co.nz
Company Address	124 Montreal Street, Sydenham, Christchurch, 8023	
Job Number	17707.000.001	
Site Address	174 Hamptons Road, Prebbleton, 7676	
Lead Surveyor	Ethan Collier	
Survey Date	May 21, 2024	

Analysis - Asbestos				
Sample #	Sample Location	Sample Description	Analysis Type	Turnaround
17707.000.001.1	Exterior	Window putty around window frames	Bulk Sample	Standard
17707.000.001.2	Interior	Building paper on ceiling	Bulk Sample	Standard
17707.000.001.3	Interior	Building paper on ceiling	Bulk Sample	Standard
17707.000.001.5	Exterior	Window putty around window frames	Bulk Sample	Standard
17707.000.001.4	Interior	Bitumen D.P.C between timber framing and concrete block walls.	Bulk Sample	Standard
17707.000.001.6	Pig Pen 1 Interior	Building paper on ceiling	Bulk Sample	Standard

Office use only		
Relinquished By: Ethan Collier	Date: May 24, 2024	Signed:
Received By:	Date:	Signed:
Comments/Instructions		

R J Hill Laboratories Limited
1/17 Print Place
Middleton
Christchurch 8024 New Zealand

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

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	3588220	A2Pv1
Contact:	Ethan Collier	**Date Received:**	22-May-2024	
	C/- Engeo Limited	**Date Reported:**	24-May-2024	
	PO Box 373	**Quote No:**	82742	
	Christchurch 8140	**Order No:**		
		Client Reference:	12903.000.017	
		Submitted By:	Josh Green	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
Window Putty Shed 1	3588220.1	Other #1	2.12	Asbestos NOT detected. Organic fibres detected.	N/A
Building Paper Shed 1	3588220.2	Bituminous Product	0.83	Asbestos NOT detected. Organic fibres detected.	N/A
Building Paper Shed 2	3588220.3	Bituminous Product	6.02	Asbestos NOT detected. Organic fibres detected.	N/A
Bitumen Packer Shed 2	3588220.4	Bituminous Product	1.90	Asbestos NOT detected. Organic fibres detected.	N/A
Window Putty Shed 2	3588220.5	Other #1	3.39	Asbestos NOT detected. Organic fibres detected.	N/A
Building Paper Animal Sheds	3588220.6	Bituminous Product	1.20	Asbestos NOT detected. Organic fibres detected.	N/A

Glossary of Terms

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

For further details, please contact the Asbestos Team.

Analyst's Comments

#1 Putty

Appendix No.1 - Chain of Custody

Summary of Methods

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

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-6
Sample Weight on receipt	Sample weight (approximate). Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.01 g	1-6
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-6

Sample Type: Building Material			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Description of Asbestos in Non Homogeneous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-6

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

Testing was completed between 23-May-2024 and 24-May-2024. For completion dates of individual analyses please contact the laboratory.

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

Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

Hill Labs

ANALYSIS REQUEST

R J Hill Laboratories Limited
1/17 Print Place
Middleton
Christchurch 8024, New Zealand

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

Job No: **358 8220**

Date Recv: 22-May-24 10:14

Received by: Jack Boyd

3135882209

Quote No	82742
Primary Contact	Ethan Collier
Submitted By	Josh Green
Client Name	Engeo Christchurch
Address	124 Montreal Street
Postcode	8023
Phone	0220985439
Mobile	
Email	
Charge To	Engeo Christchurch
Client Reference	12903.000.017
Order No	

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

☒ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☐ *Email Other*

☐ *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time: 21/05/2024

Name: Josh Green

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

Signature:

Samples will be processed at a Hill Labs site with the appropriate testing capability and capacity. Please inform the lab if you wish samples to be retained and analysed at the site of receipt.

Received at Hill Laboratories

Date & Time: 21/05/2024

Name: Josh Green

Signature:

ADDITIONAL INFORMATION

Priority ☐ **Low** ☒ **Normal** ☐ **High**

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

Requested Reporting Date:

*Please ensure all asbestos samples are **individually double bagged** upon submission to the laboratory.*

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (if not as per Quote)
1	Window Putty	putty	Shed 1	21/05/2024	Asbestos
2	Building Paper	paper	Shed 1	21/05/2024	Asbestos
3	Building Paper	paper	Shed 2	21/05/2024	Asbestos
4	Bitumen Packer	packer	Shed 2	21/05/2024	Asbestos
5	Window Putty	putty	Shed 2	21/05/2024	Asbestos
6	Building Paper	Paper	nimal She	21/05/2024	sbestos
7					
8					
9					
10					
11					
12					

Appendix 6
Risk Assessment Algorithm

Material Risk Assessment Algorithm

Product Type (or Debris From Product)

Score	Example of scores
0	No Asbestos, (for negative samples only)
1	Asbestos reinforced composites (plastic, resins, mastics, roofing felts, vinyl floor tiles, semi-rigid paints or decorative finishes, asbestos cement)
2	Asbestos insulating board, mill boards, other low density insulation boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper and felt.
3	Thermal installation (i.e. pipe and boiler lagging), sprayed asbestos, loose asbestos, asbestos mattresses and packing.

Extent Of Damage / Deterioration

Score	Example of scores
0	Good condition: no visible damage.
1	Low damages: a few scratches or surfaces marks, broken edges of 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 Treatment

Score	Example of scores
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 sheet etc.
2	Unsealed asbestos insulating board, or encapsulated lagging and sprays.
3	Unsealed laggings and sprays.

Asbestos Type

Score	Examples of scores
2	Awaiting Result
0	Negative
1	Chrysotile
2	Amosite
3	Crocidolite
3	Other Amphibole
2	Chrysotile and Amosite
3	Chrysotile and Crocidolite
3	Crocidolite and Amosite
3	Chrysotile, Amosite and Crocidolite

Priority Risk Assessment Algorithm

Assessment Factor		Score	Examples of score variables
Normal occupant activity	Main Type Of Activity In Area	0	Rare disturbance activity (i.e. little used store room)
		1	Low disturbance (i.e. Office type activity)
		2	Periodic disturbance (i.e. industrial or vehicular activity which may contact ACM's)
		3	High levels of disturbance (i.e. fire doors with asbestos insulating board sheet in constant use)
Likelihood of disturbance	Location	0	Outdoors
		1	Large room or well ventilated areas
		2	Room up to 100m2
		3	Confined spaces
	Accessibility	0	Usually inaccessible or unlikely to be disturbed
		1	Occasionally likely to be disturbed
		2	Easily disturbed
		3	Routinely disturbed
	Extent/Amount	0	Small amounts or single items (eg strings, gaskets)
		1	Less than 10 sq metres area, or 10 metre pipe run
		2	10 to 50 sq metres area or 10 to 50 metres pipe run
		3	more than 50 sq metres, or 50 metres pipe run
Human exposure potential	Number Of Occupants	0	None
		1	1 to 3 people
		2	4 to 10 people
		3	>10 people
	Frequency Of Use Area	0	Infrequent
		1	Monthly
		2	Weekly
		3	Daily
	Average Time Area Is In Use	0	< 1 hour
		1	> 1 to < 3 hours
		2	> 3 to < 6 hours
		3	> 6 hours
Maintenance Activity	Type	0	Minor disturbance (i.e. possibility of contact when gaining access)
		1	Low disturbance (i.e. changing light bulbs in asbestos insulating board ceiling)
		2	Medium disturbance (i.e. lifting one or two asbestos insulating board ceiling tiles to access a valve)
		3	High levels of disturbance (i.e. removing a number of asbestos insulating board ceiling tiles to replace a valve or for re-cabling)

	Frequency Of Maintenance Activity	0	ACM unlikely to be disturbed for maintenance
		1	< 1 per year
		2	> 1 per year
		3	> 1 per month

APPENDIX 3:

Soil Results

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

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

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	3593017 SPv1
Contact:	Natalie Flatman C/- Engeo Limited PO Box 25047 Wellington 6146	**Date Received:**	28-May-2024
		Date Reported:	30-May-2024
		Quote No:	82742
		Order No:	
		Client Reference:	17707.000.006
		Submitted By:	Josh Green

Sample Type: Soil

		Sample Name:	A1_VS01 27-May-2024 11:10 am	A1_VS02 27-May-2024 11:15 am	A1_VS03 27-May-2024 11:20 am	A1_VS04 27-May-2024 11:25 am	A1_VS05 27-May-2024 11:30 am
		Lab Number:	3593017.1	3593017.2	3593017.3	3593017.4	3593017.5
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		4	5	4	7	5
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	0.13	0.13	0.19	0.14
Total Recoverable Chromium	mg/kg dry wt		13	12	12	14	12
Total Recoverable Copper	mg/kg dry wt		5	8	7	13	8
Total Recoverable Lead	mg/kg dry wt		13.9	37	27	99	28
Total Recoverable Nickel	mg/kg dry wt		8	8	8	8	7
Total Recoverable Zinc	mg/kg dry wt		61	110	91	157	121

		Sample Name:	A2_VS01 27-May-2024 11:45 am	A2_VS02 27-May-2024 11:50 am	A2_VS03 27-May-2024 11:55 am	A2_VS04 27-May-2024 12:00 pm	A2_VS05 27-May-2024 12:05 pm
		Lab Number:	3593017.6	3593017.7	3593017.8	3593017.9	3593017.10
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		3	4	4	5	5
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt		10	12	13	14	14
Total Recoverable Copper	mg/kg dry wt		3	4	4	5	5
Total Recoverable Lead	mg/kg dry wt		10.5	10.2	13.3	15.5	14.0
Total Recoverable Nickel	mg/kg dry wt		7	8	9	10	10
Total Recoverable Zinc	mg/kg dry wt		40	41	56	62	63

		Sample Name:	A2_VS06 27-May-2024 12:10 pm	A2_VS07 27-May-2024 12:15 pm	A2_VS08 27-May-2024 12:20 pm	A2_VS09 27-May-2024 12:25 pm	A2_VS10 27-May-2024 12:30 pm
		Lab Number:	3593017.11	3593017.12	3593017.13	3593017.14	3593017.15
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		4	10	14	18	23
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt		14	12	14	13	13
Total Recoverable Copper	mg/kg dry wt		5	5	5	10	6
Total Recoverable Lead	mg/kg dry wt		15.9	15.6	12.2	18.5	13.9
Total Recoverable Nickel	mg/kg dry wt		11	8	11	8	8
Total Recoverable Zinc	mg/kg dry wt		75	68	44	75	64

Sample Type: Soil						
Sample Name:		A2_VS11 27-May-2024 12:35 pm	A3_VS1 27-May-2024 12:55 pm	A3_VS2 27-May-2024 1:00 pm	A3_VS3 27-May-2024 1:05 pm	A3_VS4 27-May-2024 1:10 pm
Lab Number:		3593017.16	3593017.17	3593017.18	3593017.19	3593017.20
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	-	13.4	51	63	199
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	8	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	5	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	15.2	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	9	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	58	-	-	-	-

Sample Name:		A3_VS5 27-May-2024 1:15 pm
Lab Number:		3593017.21
Individual Tests		
Total Recoverable Lead	mg/kg dry wt	188

Analyst's Comments

Appendix No.1 - Chain of Custody

Summary of Methods

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

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-21
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	17-21
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-16
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	17-21
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	17-21

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

Testing was completed between 28-May-2024 and 30-May-2024. For completion dates of individual analyses please contact the laboratory.

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

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

Job No: 359 3017 Date Recv: 28-May-24 06:43

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

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

Received by: Nathaniel Sue

3135930176

Quote No 82742
Primary Contact Natalie Flatman
Submitted By Josh Green
Client Name ENGEO Ltd
Address 124 Montreal Street
Postcode 8023
Phone 027 335 0114 *Mobile*
Email nflatman@engeo.co.nz
Charge To ENGEO Ltd
Client Reference 17707.000.006
Order No

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

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client
☐ Email Other
☐ Other

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the Laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
Date & Time: 27/05/2024
Name: Josh Green
☐ *Tick if you require COC to be emailed back*
Signature:

Received at Hill Laboratories
Date & Time:
Name:
Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen
Temp: 11.0

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ Low ☑ Normal ☐ High
☐ Urgent (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	A1_VS01	27/05	11.10	S	HM
2	A1_VS02	27/05	11.15	S	HM
3	A1_VS03	27/05	11.20	S	HM
4	A1_VS04	27/05	11.25	S	HM
5	A1_VS05	27/05	11.30	S	HM
6	A2_VS01	27/05	11.45	S	HM
7	A2_VS02	27/05	11.50	S	HM
8	A2_VS03	27/05	11.55	S	HM
9	A2_VS04	27/05	12.00	S	HM
10	A2_VS05	27/05	12.05	S	HM
11	A2_VS06	27/05	12.10	S	HM
12	A2_VS07	27/05	12.15	S	HM

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	A2_VS08	27/05	12.20	S	HM
14	A2_VS09	27/05	12.25	S	HM
15	A2_VS10	27/05	12.30	S	HM
16	A2_VS11	27/05	12.35	S	HM
17	A3_VS01	27/05	12.55	S	Lead
18	A3_VS02	27/05	1.00	S	Lead
19	A3_VS03	27/05	1.05	S	Lead
20	A3_VS04	27/05	1.10	S	Lead
21	A3_VS05	27/05	1.15	S	Lead
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40					

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

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

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	3595125	SPv1
Contact:	Natalie Flatman	**Date Received:**	30-May-2024	
	C/- Engeo Limited	**Date Reported:**	04-Jun-2024	
	PO Box 25047	**Quote No:**	82742	
	Wellington 6146	**Order No:**		
		Client Reference:	17707.000.006	
		Submitted By:	Josh Green	

Sample Type: Soil

		Sample Name:	A4_VS01 27-May-2024 1:15 pm	A4_VS02 27-May-2024 1:20 pm
		Lab Number:	3595125.1	3595125.2
Heavy Metals, Screen Level				
Total Recoverable Arsenic	mg/kg dry wt		30	30
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt		26	13
Total Recoverable Copper	mg/kg dry wt		5	8
Total Recoverable Lead	mg/kg dry wt		13.5	20
Total Recoverable Nickel	mg/kg dry wt		9	9
Total Recoverable Zinc	mg/kg dry wt		48	58

Summary of Methods

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

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-2
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-2

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

Testing was completed between 30-May-2024 and 04-Jun-2024. For completion dates of individual analyses please contact the laboratory.

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

Kim Harrison MSc
Client Services Manager - Environmental