ENGEO

Celebrating 10 YEARS IN NZ

Soil Validation Report

Southeast Faringdon

Selwyn Road, Rolleston

Submitted to:

Hughes Developments Ltd
8 Mill Lane
Christchurch

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ACENZ

Contents

Tables

Figures

Appendices

ENGEO Document Control:

Report Title	Soil Validation Report - Southeast Faringdon, Selwyn Road, Rolleston			
Project No.	12903.000.006	Doc ID	112	
Client	Hughes Developments Ltd	Client Contact	Kelvin Back	
Distribution (PDF)	Hughes Developments Ltd			
Date	Revision Details/Status	WP	Author	Reviewer
01/12/2020	Issued to Client	VB	NF	DR
04/12/2020	Revision 1	-	NF	DR
13/01/2021	Revision 2	DF	NF	DR
09/03/2021	Revision 3	DF	NF	DR

1 Introduction

ENGEO Ltd was requested by Hughes Developments Ltd to prepare a soil validation report of the property at Southeast Faringdon, Selwyn Road, Rolleston (herein referred to as 'the site'). During the intrusive environmental investigation at the site, concentrations of heavy metals were observed in a burn pile and waste pit at 417 Springston Rolleston Road, Rolleston. The concentrations of heavy metals were reported above the proposed residential 10 % produce end use, therefore remedial earthworks were required to enable the redevelopment of the site. Validation samples were performed following the removal of the impacted material from the previously identified areas. Figure 1 and 2 appended shows the areas of validation sampling.

1.1 Objectives of Site Validation Report

The objective of the validation report is to detail the site works undertaken and provide evidence that the site is suitable for its end use.

The validation report is required to be sent to Selwyn District Council (SDC) and Environment Canterbury to seek acknowledgement that the contaminants of concern relating to the site are below the relevant residential land use standards. Following acknowledgement from SDC that the contamination has been successfully remediated to the appropriate level, it is anticipated that the redevelopment works can continue.

Please note that this report is for the validation of the targeted remediation area only and does not seek to provide a full characterisation of soil across the whole site as this is described in the report produced by ENGEO, 2019.

2 Site Description

2.1 Site Location

Site information is summarised in Table 1 below.

Table 1: Site Information

Item	Description
Location	417 Springston Rolleston Road 694 Selwyn Road 700 Selwyn Road 708 Selwyn Road 710 Selwyn Road 728 Selwyn Road
Legal Description	LOT 1 DP 60892 BLK III LEESTON SD, LOT 2 DP 341771 BLK III LEESTON SD, LOT 1 DP 341771 BLK III LEESTON SD, LOT 2 DP 479375, LOT 1 DP 479375 LOT 1 DP 441634 and LOT 2 DP 63632 LOT 3 DP 441634
Current Land Use	Residential and undeveloped land (previous grazing)
Proposed Land Use	Residential
Site Area	Approximately 35.32 ha
Territorial Authority	Selwyn District Council

3 Previous Environmental Investigations

ENGEO has previously completed the following environmental reports within this site:

- 417 Springston Rolleston Road dated 13 December 2018;
- 694 Selwyn Road dated 13 December 2016;
- 728 Selwyn Road dated 17 May 2017;
- 700 Selwyn Road dated 1 May 2017; and
- 708 & 710 Selwyn Road dated 3 October 2019.

A summary of the environmental works undertaken to date are included in Table 2 below.

Table 2: Summary of Environmental Works

Address	Phase	Work required
417 Springston Rolleston Road	PSI completed, two areas identified – rubbish pit and burn off area.	DSI for rubbish pit & burn off area. Asbestos demolition survey of buildings required as constructed prior to 2000.
694 Selwyn Road	DSI completed – no exceedances reported against residential criteria.	Asbestos demolition survey of buildings required as constructed prior to 2000.
700 Selwyn Road	PSI completed, burn drum identified.	DSI for burn drum. Asbestos demolition survey of buildings required as constructed prior to 2000.
708 Selwyn Road	DSI completed	One area of land disturbance (potential waste offal pit) required to be excavated.
710 Selwyn Road	DSI completed	No exceedances against the NES.
728 Selwyn Road	PSI completed, no areas of concern.	NA

ENGEO also received correspondence from Selwyn District Council that they were not satisfied that enough samples were collected from an area of imported soils at 694 Selwyn Road. It was therefore decided that this area would be sampled during the DSI for the site (ENGEO, 2020).

Correspondence received from Selwyn District Council indicated that further sampling of the burn pile at 694 Selwyn Road was required. ENGEO returned to site and sampled the soils which were remaining in the area of the burn pile. Two soil samples were reported as exceeding the NES residential land use criteria for arsenic, therefore targeted removal of these soils was detailed in ENGEO's RAP for the site. Validation samples from this area following removal of the impacted soils are included within this report.

A small community garden was also present along the western boundary line at 728 Selwyn Road. The garden has recently been established to provide fresh fruit and vegetables to residents in the area. ENGEO currently understands that the garden is to remain in situ, therefore sampling was not undertaken as a part of this DSI.

3.1 Human Health and Environmental Risks

The potential human health risks identified at the site prior to the removal of soils and based on the current and proposed land use are presented in Table 3 below.

Table 3: Conceptual Site Model - DSI

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk?
Area 1 – Waste pit	Heavy metals, PAHs	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	**No**. Heavy metals present above land use criteria.
Area 2 – Burn pile	Heavy metals, PAHs	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	**No**. Heavy metals present above land use criteria.
Area 7 – Burn pile	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	**No**. Heavy metals present above land use criteria.

4 Remediation

4.1 Remedial Method

The preferred remedial method was excavation of the impacted material and disposal off-site. The soil samples collected from the burn pile and waste pit met the Burwood Resource Recovery Park values. All remediation was overseen by Natalie Flatman of ENGEO and was undertaken in accordance with the remedial action plan for the site (ENGEO, 2020).

The inorganic material (timber, metal and plastics) from the waste pit and burn pile was removed from the two areas and disposed to Kate Valley with other waste material from the development site. The soils were then excavated from the burn pile and waste pit and stockpiled on-site before being loaded into a bin for disposal. Soil samples were collected from the two areas on 30 September 2020. One sample from the burn pile, sample VS3, collected from the eastern extent of the pile reported arsenic above the NES residential land use value. An additional excavation was undertaken on 6 October 2020 to remove the hotspot from around VS3 which was subsequently mixed with soils from on-site with a mixing ratio of 1:3 of contaminated soils to clean soil. Sampling occurred after the mixing of the additional remedial area and mixed stockpile.

The preferred remedial method for Area 7 was excavation of the impacted burn pile material with disposal off-site. The soil samples collected from the burn pile during the DSI met the Frews Hororata acceptance criteria. A total of three soil samples were collected from the base of the burn pile remedial area for validation.

4.2 Validation Sampling

Upon completion of the removal of the burn pile and waste pit at 417 Springston Rolleston Road and the burn pile at 694 Selwyn Road, ENGEO undertook validation sampling which included:

- Collection of soil samples from the walls and base of the excavations using a hand trowel (burn pile) and excavator (waste pit). The samples were compressed directly into laboratory supplied containers using a new pair or 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;
- Inspection of each sample for visual and olfactory indicators of contamination; and
- Submission of soil samples to RJ Hill Laboratories (Hills) in Hamilton under standard ENGEO chain of custody for analysis of contaminants of concern (heavy metals).

Validation samples were not required at the other burn pits as samples during the investigation did not return concentrations above residential criteria.

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 for the samples;
- The use of Hills, an International Accreditation New Zealand (IANZ) laboratory, to conduct all laboratory analysis. To maintain their accreditation, Hills undertakes rigorous cross checking and routine duplicate sample testing to ensure the accuracy of their results; and
- During the site sampling, every attempt was made to ensure that cross contamination did not occur through the use of the procedures outlined within this document.

Site photographs of the remediation are provided in Figure 1 below.

Figure 2: Site Photographs

Photo 1: Area 1: Waste pit after removal

Photo 2: Area 1: Waste pit after removal

Photo 3: Area 2: Burn pile after removal

Photo 4: Area 2: Burn pile after removal

Photo 5: Area 7: Burn pile after removal

Photo 6: Area 7: Burn pile after removal

5 Contractor Documentation

The following documentation was provided by Hughes Developments who were involved in the remedial works including both the excavation of the material and the cartage off-site. All waste dockets are provided in Appendix 1.

- Waste manifests issued by Burwood Resource Recovery Park indicated that approximately 1.06 tonnes of material were removed from the site and disposed of at Burwood.
- Waste manifests issued by Frews Hororata indicated that approximately 7.08 tonnes of material were removed from the site and disposed of at Hororata.

6 Adopted Investigation 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 ingestion) as this is the proposed land use of the site following remediation.

7 Site Validation Results

Table 4 compares the soil concentrations in the samples tested with the adopted investigation criteria. Full analytical results are included in Appendix 2.

Discussion of Results

Area 1: All samples collected from the waste pit have reported below the NES SCS concentrations for residential land use and below the site specific regional background levels for heavy metals.

Area 2: Burn pile – one sample, SV3, returned concentrations of arsenic above the NES residential land use criteria. This sample also reported arsenic, chromium, copper and zinc above the site specific regional background values. All other samples collected from the burn pile were below the applicable NES SCS and below the background values for the site. After the additional removal of the hotspot in the burn pile, one additional sample was collected from the eastern wall of the burn pile which returned concentrations below the NES residential criteria. The sample collected from the mixed stockpile reported copper and zinc above the site specific regional background values. As these values were below the NES SCS, further remediation was not required. These soils were subsequently placed into an on-site borrow pit. Please refer to Figure 3 attached for the location of the Borrow Pit.

Area 7: All samples collected from the waste pit have reported below the NES SCS concentrations for residential land use and below the site specific regional background levels for heavy metals.

Table 4: Laboratory Analysis Results

Sample Name	VS1	VS2	VS3	VS4	VS5	VS6	VS7	VS8	VS9	VS10	S11	S12	S13	A7_ VS1	A7 VS2	A7 VS3	Human health criteria – Residential land use ALL PATHWAYS[af g]	Human health criteria - Commercial / industrial outdoor worker (unpaved)[ag]	Regional background - Trace Elements (Level 2)[b]
Soil Type	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT			
Sample Depth, m	0.2	0.2	0.2	0.2	0.2	1.5	1.5	1.5	1.5	1.5	0.35	Stkpile	Stkpile	0.3	0.3	0.3			
Heavy Metals in soil, mg/kg																			
Arsenic	4	3	**57**	4	6	7	5	4	6	5	4	8	8	4	4	4	20	70	12.58
Cadmium	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.13	0.11	<0.1	<0.1	<0.1	3	1,300	0.19
Chromium[d]	14	12	30	12	13	14	14	12	14	14	12	13	12	13	13	12	460	6,300	22.7
Copper	5	4	56	7	5	7	6	5	7	5	8	2,100	14	4	5	5	>10,000	>10,000	20.3
Lead	14.4	15.3	23	19.6	14.6	15.6	15.8	13.5	14.4	18.5	26	31	27	14.5	15.9	15.5	210	3,300	40.96
Nickel	7	8	8	8	8	7	10	9	10	9	8	7	8	10	9	9	400	6,000[c]	20.7
Zinc	47	46	330	58	56	39	53	41	47	72	67	123	93	52	53	50	7,4000	400,000[c]	93.94

Notes:

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

Italics text indicates that the concentration exceeds the commercial / industrial land use criterion.

Underlined text indicates that the concentrations exceeds the inhalation criterion.

[a] MfE (2012) Human health criteria from the NES except where noted.

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

[d] Criteria for Chromium VI were conservatively selected.

8 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 5.

Table 5: Conceptual Site Model

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk? So samples meet acceptance criteria?
Burn pile Area 1	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 commercial users Surrounding environment	**Yes.** All samples collected from the Burn Pile area have returned below the NES residential land use criteria.
Waste pit Area 2	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 commercial users Surrounding environment	**Yes.** All samples collected from the Waste Pit area have returned below the NES residential land use criteria.

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk? So samples meet acceptance criteria?
Burn Pile Area 3	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 commercial users Surrounding environment	**Yes.** All samples collected from the Burn Pile area have returned below the NES residential land use criteria.

9 Conclusions

Following the completion of the remedial works described in ENGEO's Remedial Action Plan (RAP), ENGEO was engaged by Hughes Developments Limited to complete site validation sampling and reporting for the remedial areas to determine if the site is suitable for the proposed residential land use.

A total of five samples were taken from burn pile after the remedial excavation of impacted soils down to 0.2 m bgl. The soil samples were analysed for heavy metals and reported concentrations below the residential criteria and commercial / industrial outdoor worker criteria. One sample returned high concentrations of arsenic which was above the NES SCS land use criteria for residential land use. The hotspot soil was excavated stockpiled and mixed with other soils from the site. The subsequent sample from the burn pile remedial area returned concentrations below the NES SCS for residential land use criteria. The mixed stockpile samples returned below the NES SCS residential land use criteria. Copper and zinc were reported in the stockpile above the site specific background values so was therefore placed in the borrow pit on-site.

A total of five samples were collected from the waste pit to a depth of 1.5 m depth. The soil samples were analysed for heavy metals and reported concentrations below the residential criteria and below the site specific regional background values.

A total of three samples were collected from the burn pile at 694 Selwyn Road at 0.3 m depth (Area 7). The soil samples were analysed for heavy metals and reported concentrations below the residential criteria and below the site specific regional background values.

A waste manifest from Burwood Resource Recovery Park indicates that approximately 1.06 tonnes of material was excavated from the waste pit and burn pile areas from 417 Springston Rolleston Road and transported to Burwood for disposal. A waste manifest from Frews Hororata show that approximate 7.09 tonnes of material was excavated from the burn pile at 694 Selwyn Road (Area 7) and transported to Hororata for disposal.

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

10 References

ENGEO (2020). Detailed Environmental Site Investigation – Faringdon Southeast, Rolleston. Ref: 12903.000.006_101.

ENGEO (2020). Remedial Action Plan – Faringdon Southeast, Rolleston, Canterbury. Ref: 12903.000.006_102.

ECan (2007) Background Concentrations of Polycyclic Aromatic Hydrocarbons in Christchurch Urban Soils. Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number: R07/19. Tonkin & Taylor Reference: 50875.004.

ECan (2007) 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.

Forsyth, P.J.; Barrell, D.J.A; Jongens, R. 2008: Sheet 16 - Geology of the Christchurch Area 1:250,000. Institute of Geological and Nuclear Sciences, Lower Hutt.

MfE Oct 2011: Ministry for the Environment Hazardous Activities and Industries List.

MfE 2012: Users' guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

MfE 2011: Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values.

MfE 2011: Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils.

National Environmental Protection Council 1999: National Environment Protection Measure Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater.

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, Hughes Developments Ltd, 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

Environmental Scientist

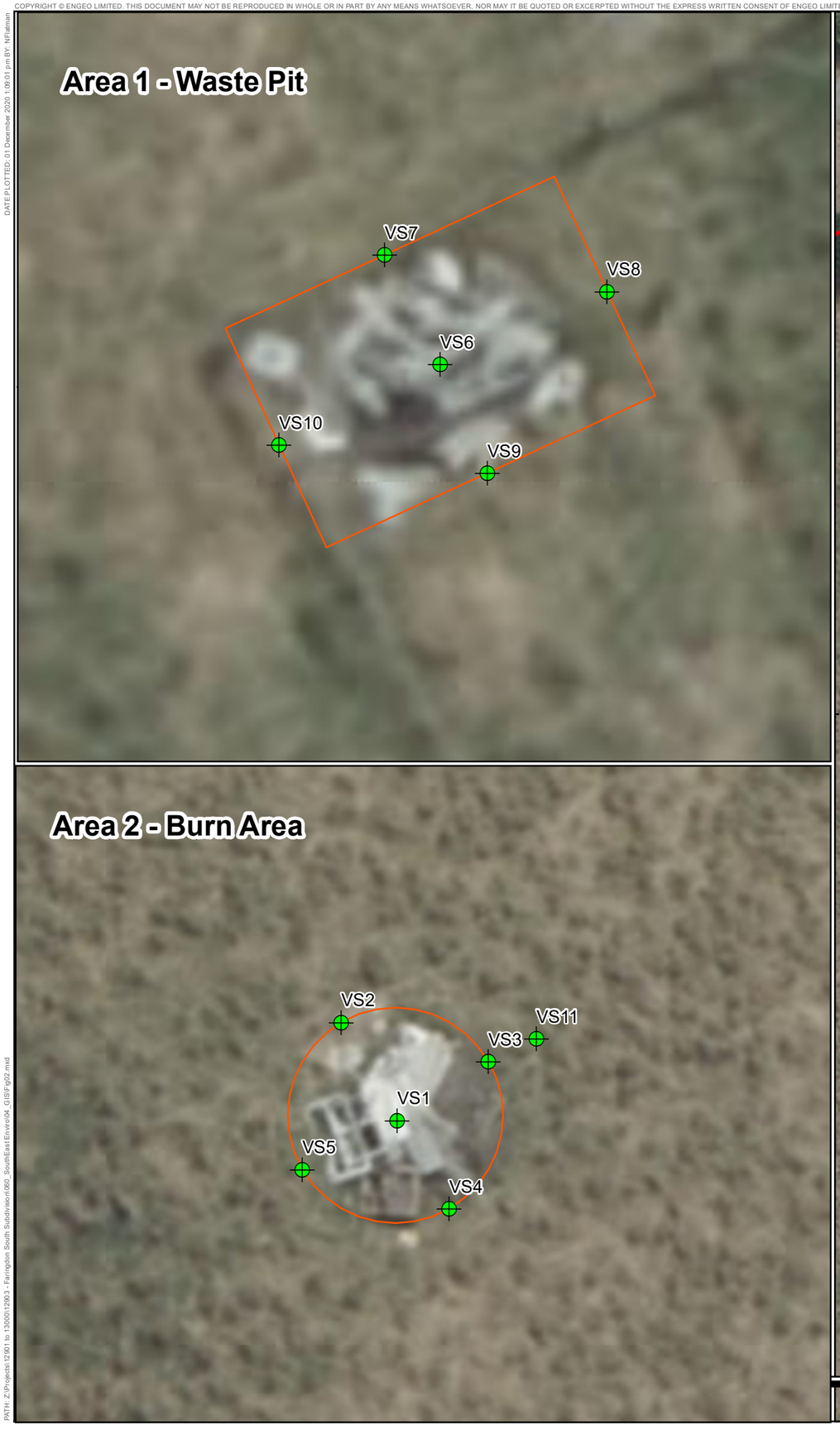
Report reviewed by

Dave Robotham, CEnvP SC

Principal Environmental Consultant

FIGURES

DATE PLOTTED: 01 December 2020 1:09:01 pm BY: NFlatman



Legend

- Validation Sample Location
- Site Boundaries
- Areas of Concern

Aerial: LINZ and Eagle Technology, CC BY 4.0.
Map image: Eagle Technology.

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

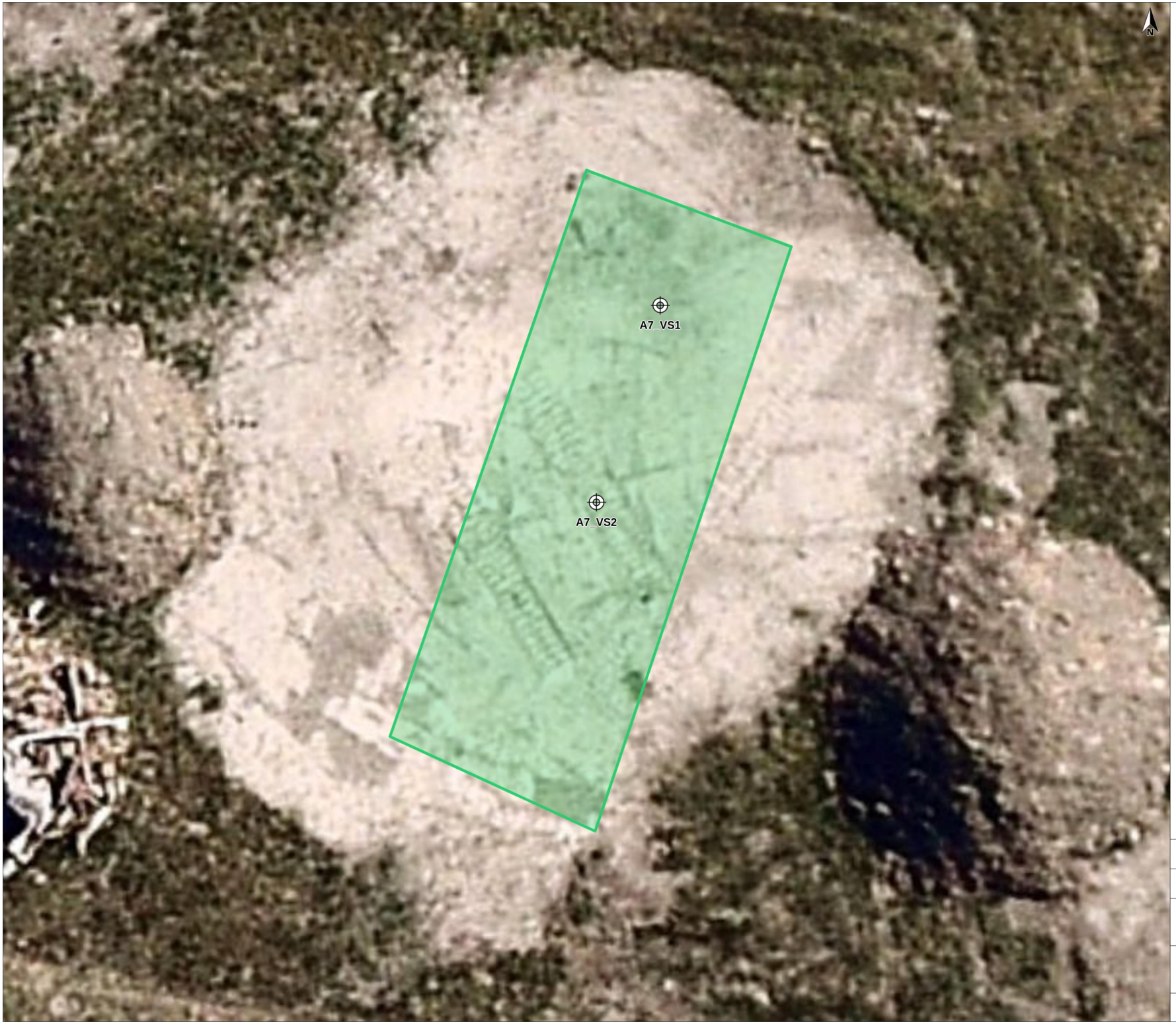
Christchurch Office
124 Montreal Street Sydenham, Christchurch 8023
Tel: 03 328 9012, www.engeo.co.nz

Title:
Remedial Areas and Validation Sample Locations

Client: Hughes Developments Ltd		Figure No: 1
Project: Faringdon Southeast Rolleston	Designed: NF Drawn: NF Checked: DR Date: Dec 20	Size: A3
Proj No: 12903.000.060	Scale: 1:500	Revision: A

ORIGINAL FIGURE PRINTED IN COLOUR

PATH: Z:\Projects\12901 to 13000\12903 - Faringdon South Subdivision\060_SouthEast Environ\04_GIS\Fig02.mxd



Legend

- Sample Locations
- Remedial Excavation

0 1.7 3m

ENGEO

Produced by **Evalu8.earth**

Title: 694 Selwyn Road - Remedial Area		
Client: Hughes Developments		Figure No: 2
Project: 694 Selwyn Road	Drawn: NF	
Date: 18-02-2021	Checked: DR	Size: A4
Proj No: 12903.000.000_694		Version: 1.0

AMENDMENTS :		
AMENDMENT	DATE	DESCRIPTION
R1	12.11.20	LOTS 1001 & 1002 AMENDED
R2	18.11.20	DIMENSIONS TO EX. BUILDING ADDED

Lot 2 DP 82966

Lot 1 DP 82966

546.52

303.80

32.97

17.04

34.00

28.50

NORTHMOOR BOULEVARD

Lot 282 DP 512548

Lot 283 DP 512548

Lot 284 DP 512548

Lot 285 DP 521415

Lot 286 DP 521415

Lot 287 DP 521415

Lot 288 DP 521415

Lot 289 DP 521415

Lot 290 DP 521415

Lot 291 DP 521415

Lot 292 DP 521415

Lot 293 DP 521415

Lot 294 DP 521415

Lot 295 DP 521415

Lot 296 DP 521415

Lot 297 DP 521415

THAMES DRIVE

HURLEY DRIVE

Lot 497 DP 521415

Lot 498 DP 524389

Lot 1002
13.1972ha

185.18

40.05

Lot 2 DP 63632 RT 549973

X

Lot 2 DP 479375 RT 667882

Lot 1001
11.7921ha

SPRINGSTON ROLLESTON ROAD

192.26

309.81

4.71

Lot 2 DP 341771 RT 171912

Lot 1 DP 341771 RT 171911

Lot 1000
10.2676ha

Lot 1 DP 60892 RT CB36A/800

254.98

260.11

25.50

17.00

12.75

30.00

4.69

30.00

Lot 1 DP 479375 RT 667881

Lot 3 DP 441634 RT 549973

17.79

17.00

19.08

36.40

33.00

20.4

33.00

12.8

5.1

21.49

Lot 1 DP 441634 RT 667881

81.67

27.88

8.48

76.0

442.92

32.00

8.48

360.23

21.20

SELWYN ROAD

NOTES:

1) Areas and dimensions are approximate & subject to final survey and deposit of plans.

2) Service easements to be created as required.

3) This plan has been prepared for subdivision consent purposes only. No liability is accepted if the plan is used for any other purpose.

4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.

5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.

6) This plan has been prepared for the use of Hughes Developments Limited only and no liability is accepted in relation to any other parties.

7) Orion Kiosk Lots have not been shown and are to be created as required following a detail electrical design.

Legend

Building to be removed.

Building to remain.

JOB TITLE:

Hughes Developments Limited
South East
Rolleston

SHEET TITLE:

Proposed Subdivision of Lot 1 DP 60892, Lot 2 DP 63632, Lots 1 & 2 DP 341771, Lots 1 & 3 DP 441634 and Lots 1 & 2 DP 479375

Total Area : 35.2569ha (RT 35.2466ha)

Comprised in: RT's. CB36A/800, 171911, 171912, 549973, 667881 & 667882

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140, New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

DRAWING STATUS

For Subdivision Consent

SCALE : 1:1250@A1 1:2500@A3

DATE : November 2020

CAD FILE : J:\20184\SUBCON SE\P20184_3 LOTS SUBDIVISION_R2.dwg

REVISION : **R.2**

DRAWING No : **P20184 SE Subcon**

SHEET No:

APPENDIX 1:

Waste Dockets

Christchurch City Council

Christchurch City Council
Special Waste Permit

Permit number: 20/104

To be completed by Environmental Health Team

Permission is given to (Company Name)	Total Waste Solutions
to dispose of	4.22 (Units) m3
Of product description	Soil
Received from (source/company)	417 Springston Rolleston Road
At	Burwood Landfill Site
Resource Consent Number (if applicable)	
Suitable for surface cover?	☑ Yes ☐ No
Time	To be confirmed with the Landfill Kiosk Operator 03 383 1331, no less than 2 working days before commencement of disposal.
Date	14/10/2020
Signature	Agnes van der Erf

658750.

BURWOOD RESOURCE RECOVERY PARK

This is a Tax Invoice

GST Number : 106-854-270

Docket Number : 453144
Date In : 17/11/2020 11:28:36
Date Out : 17/11/2020 11:45:42

Transporter :
Vehicle : TPI Unknown Customer
Product : EJB317
: CCC Special Soil Cla

First Weight : 6,600 Kg
Second Weight : 5,540 Kg
Net Weight : 1,060 Kg

Job Number: CCC
Job Address: Misc
Billing Customer: CCC Landfill Custon
Manifest Number: 658750

Thankyou.
For all account enquiries,
please phone 0800 664 433

frews contracting

Manifest Number: 4529

CLEAN FILL TRANSFER MANIFEST

DATE: 22-2-21	TIME:

JOB DETAILS (POINT OF ORIGIN)

Job / Site Address:	Frews Job Number:
694 Selwyn rd	1191

BILLING CUSTOMER DETAILS

Billing Customer:	Contact Name:
Hughes Developments	Barry T

TRANSPORTER DETAILS

Transporter Name:	Truck Only / Truck & Trailer (TICK ONE)	Truck Rego:
Frews 647	☑	JRC 814

WASTE DETAILS

	Tick One
ASBESTOS CONTAINING MATERIAL	
MIXED HARDFILL	
Other (Please specify): Heavy Metals	✓

RECEIVED BY

NAME (Authorised Rep): Doug

SIGNATURE (Authorised Rep):

NOTES

1. A
2. .
3. /

FOR ALL E:

Issue: Ver 1

e Copy

irint.co.nz

Frews Quarries Ltd
Plantation Road, Horotata Christchurch
GST: 113 453 222
Docket No : P17621

Vehicle : FRE647 - FREWS
Charge To : FREWCO - FREWS
Product : SPECIAL WASTE (TN)
Order : 1191 HUGHES DEVELOPMENTS
Notes : DRIVE SAFE
Tare : 12,400 10:01:25 AM 22-Feb
Gross : 19,480 10:04:07 AM 22-Feb
Net : 7,080
Delivery : Supply Only
Printed : 10:04:07 AM 22/02/2021
Signature:

APPENDIX 2:

Laboratory Certificates

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
28 Duke Street Frankton 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

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	2447129 SPv1
Contact:	Natalie Flatman C/- Engeo Limited PO Box 373 Christchurch 8140	**Date Received:**	01-Oct-2020
		Date Reported:	05-Oct-2020
		Quote No:	82742
		Order No:	
		Client Reference:	12903.000.006
		Submitted By:	Natalie Flatman

Sample Type: Soil

		Sample Name:	VS1 30-Sep-2020	VS2 30-Sep-2020	VS3 30-Sep-2020	VS4 30-Sep-2020	VS5 30-Sep-2020
		Lab Number:	2447129.1	2447129.2	2447129.3	2447129.4	2447129.5
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		4	3	57	4	6
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	< 0.10	0.13	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt		14	12	30	12	13
Total Recoverable Copper	mg/kg dry wt		5	4	56	7	5
Total Recoverable Lead	mg/kg dry wt		14.4	15.3	23	19.6	14.6
Total Recoverable Nickel	mg/kg dry wt		7	8	8	8	8
Total Recoverable Zinc	mg/kg dry wt		47	46	330	58	56

		Sample Name:	VS6 30-Sep-2020	VS7 30-Sep-2020	VS8 30-Sep-2020	VS9 30-Sep-2020	VS10 30-Sep-2020
		Lab Number:	2447129.6	2447129.7	2447129.8	2447129.9	2447129.10
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		7	5	4	6	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		14	14	12	14	14
Total Recoverable Copper	mg/kg dry wt		7	6	5	7	5
Total Recoverable Lead	mg/kg dry wt		15.6	15.8	13.5	14.4	18.5
Total Recoverable Nickel	mg/kg dry wt		7	10	9	10	9
Total Recoverable Zinc	mg/kg dry wt		39	53	41	47	72

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 Laboratories, 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%.	-	1-10
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	1-10

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

Testing was completed on 05-Oct-2020. For completion dates of individual analyses please contact the laboratory.

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

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

Martin Cowell - BSc
Client Services Manager - Environmental

Hill Laboratories
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W www.hill-laboratories.com

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	2450580	SPv1
Contact:	Natalie Flatman	**Date Received:**	07-Oct-2020	
	C/- Engeo Limited	**Date Reported:**	09-Oct-2020	
	PO Box 373	**Quote No:**	82742	
	Christchurch 8140	**Order No:**		
		Client Reference:	12903.000.007	
		Submitted By:	Natalie Flatman	

Sample Type: Soil

		Sample Name:	S11 06-Oct-2020	S12 06-Oct-2020	S13 06-Oct-2020		
		Lab Number:	2450580.1	2450580.2	2450580.3		
Heavy Metals, Screen Level							
Total Recoverable Arsenic	mg/kg dry wt		4	8	8	-	-
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	0.13	0.11	-	-
Total Recoverable Chromium	mg/kg dry wt		12	13	12	-	-
Total Recoverable Copper	mg/kg dry wt		8	2,100	14	-	-
Total Recoverable Lead	mg/kg dry wt		26	31	27	-	-
Total Recoverable Nickel	mg/kg dry wt		8	7	8	-	-
Total Recoverable Zinc	mg/kg dry wt		67	123	93	-	-

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 Laboratories, 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%.	-	1-3
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	1-3

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

Testing was completed on 09-Oct-2020. 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
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ANALYSIS REQUEST

R J Hill Laboratories Limited
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Hamilton 3240, New Zealand

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E mail@hill-labs.co.nz
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Job No: **245 0580**

Date Recv: 07-Oct-20 05:57

Received by: Jonas Eyskens

3124505805

Quote No

Primary Contact Natalie Flatman

Submitted By Natalie Flatman

Client Name ENGEO Ltd

Address 124 Montreal Street, Sydenham

Christchurch *Postcode* 8023

Phone 033289012 *Mobile* 0273350114

Email nflatman@engeo.co.nz

Charge To ENGEO Ltd

Client Reference 12903.000.007

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*

ADDITIONAL INFORMATION

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
Date & Time: 6/10/2020 4:00pm
Name: N Flatman
☐ *Tick if you require COC to be emailed back*
Signature:

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

Condition ☐ *Room Temp* ☐ *Chilled* ☐ *Frozen* Temp: 8.8

☐ *Sample and Analysis details checked*
Signature:

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	S11	6/10/2020		ES	Heavy metals
2	S12	6/10/2020		ES	Heavy metals
3	S13	6/10/2020		ES	Heavy metals
4					
5					
6					
7					
8					
9					
10					
11					
12					

Continued on next page

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Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	2535407 SPv1
Contact:	Natalie Flatman	**Date Received:**	23-Feb-2021
	C/- Engeo Limited	**Date Reported:**	25-Feb-2021
	PO Box 373	**Quote No:**	82742
	Christchurch 8140	**Order No:**	
		Client Reference:	12903.000.000_694
		Submitted By:	Natalie Flatman

Sample Type: Soil

Sample Name:		A7_VS1 22-Feb-2021	A7_VS2 22-Feb-2021	A7_VS3 22-Feb-2021		
Lab Number:		2535407.1	2535407.2	2535407.3		
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	4	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	13	13	12	-	-
Total Recoverable Copper	mg/kg dry wt	4	5	5	-	-
Total Recoverable Lead	mg/kg dry wt	14.5	15.9	15.5	-	-
Total Recoverable Nickel	mg/kg dry wt	10	9	9	-	-
Total Recoverable Zinc	mg/kg dry wt	52	53	50	-	-

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 Laboratories, 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%.	-	1-3
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	1-3

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

Testing was completed on 25-Feb-2021. 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.

Martin Cowell - BSc
Client Services Manager - Environmental