



12 January 2024

Jo Young
Natural Resources Planner
Stevenson Aggregates Limited
4-10 Reliable Way
Mt Wellington
AUCKLAND 1061

Dear Jo,

UPDATED - SUTTON BLOCK EXTENSION TO DRURY QUARRY – SOIL CHARACTERISATION INVESTIGATION

1.0 Introduction

Pattle Delamore Partners Limited (PDP) has been engaged by Stevenson Aggregates Limited (SAL) to undertake a soil characterisation investigation of the surface and near surface material located within the Sutton Block, which comprises part properties located at 1189 Ponga Road and 121 MacWhinney Drive, Drury, Auckland (collectively referred henceforth as ‘the site’; refer white outline of property parcels in Figure 1). It is understood that that works proposed in the Sutton Block are to extend the current Drury Quarry with similar quarry operations including stripping of ‘overburden’ material – which is the subject surface and near-surface material at the site (refer to Section 1.1 below for a summary of the 2023 revised Sutton Block pit extension proposal). The proposed quarry pit extension (refer to Figure 1) is expected to cover:

- The majority of grassed land located on 1189 Ponga Road and excludes areas of native bush land in the northern and eastern sections of the property, and the area of Ballards Cone (orange border) in the south of the property; and
- The eastern area of grassed land located on 121 MacWhinney Drive, excluding areas of native bush land in the western and the southern parts of the property, and Ballards Cone within this property parcel.

This investigation builds upon the Updated Preliminary Site Investigation (PSI) report completed by PDP on 9 January 2024 for the Sutton Block, which identified potential areas/activities categorised under the Hazardous Activity and Industry List (HAIL)¹ (PDP, 2024) surrounding and including some of the existing farm buildings and structures. As such, these areas are excluded from this assessment (refer Figure 1). The PSI concluded that the remaining areas of the Sutton Block are confirmed to represent non-HAIL areas and will therefore be exempt from further requirements of the NES-CS (as described in Regulation 5 (7)) and the contaminated land rules of the AUP-OP.

¹ The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.



This soil characterisation investigation has been undertaken in these non-HAIL areas of the Sutton Block to support future options for onsite reuse, and offsite disposal options for the topsoil and clay overburden material.

This investigation has been overseen and reviewed by a Suitably Qualified and Experienced Practitioner (SQEP) with respect to contaminated land and has been undertaken in general accordance with the Ministry for the Environment (MfE) *Contaminated Land Management Guidelines No.1 – Reporting on Contaminated Sites in New Zealand* (MfE, 2021a) and *No.5 – Site Investigation and Analysis of Soils* (MfE, 2021b). This letter report provides the findings of the investigation.

1.1 Project Description for the 2023 Revised Sutton Block Pit Extension

SAL Drury Quarry is located in Drury, within the Auckland Region, and has been in operation for over 80 years. Drury Quarry is a greywacke hard rock quarry supplying concrete, asphalt and roading aggregate to the Auckland market. The Drury Quarry pit is located within the wider landholdings owned by SAL, which encompasses an area of approximately 562ha. This landholding includes quarry activities, a clean fill, farmland and large swathes of native vegetation.

Based on current demand estimates, the existing pit will provide approximately 20 years of aggregate supply to Auckland. To continue to provide a local supply of aggregate resource SAL proposes to develop a new pit within the existing site, called 'the Sutton Block'. The Sutton Block pit has been designed to provide approximately 185 million tonnes of additional aggregate to supply the market.

The Sutton Block is located to the northeast of the existing pit. The development of the Sutton Block will involve the staged development of an area of approximately 87.7 ha to a maximum pit depth of approximately 60 m RL. The Sutton Block is designed to be a separate quarry pit although it will be serviced by the existing Drury Quarry ancillary site infrastructure and facilities.

Further details are provided in the *Drury Quarry, Sutton Block, Assessment of Environmental Effects* (AEE) report (Tonkin + Taylor, in preparation).

2.0 Objective and Scope of Works

2.1 Objective

The key objective of this investigation is to characterise the contaminant concentrations within the surface and near-surface topsoil and clay materials within the site (in the non-HAIL areas).

The purpose of the characterisation is to confirm the material as complying with the 'cleanfill' definition within the Auckland unitary Plan – Operative in Part (AUP-OP) to permit unrestricted reuse onsite, and sale and removal/disposal to offsite locations.

The AUP-OP definition of cleanfill is *natural materials which do not contain contaminants at levels greater than background concentrations, and which have no adverse effects on the environment*.

2.2 Scope of Works

In order to achieve this objective, the following scope of works (as agreed with SAL) has been undertaken:

- ✧ Soil sampling of the topsoil and clay overburden in the non-HAIL areas across the site.
- ✧ Laboratory analysis of collected soil samples for a suite of heavy metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc), organochlorine pesticides (OCPs) and polycyclic aromatic hydrocarbons (PAHs).
- ✧ Assessment of analytical sample results against relevant soil contaminant definitions (i.e. 'cleanfill').
- ✧ Provision of this letter report.

3.0 Site Description

The site comprises the proposed quarry pit extension comprising parts of the properties located at 1189 Ponga Road and 121 MacWhinney Drive (refer Figure 1).

Table 1: Property Information	
Site Address	Description
1189 Ponga Road	SECT 2 SO 467566, ALLOT 37 Parish OF HUNUA, ALLOT 198 Parish OF HUNUA, ALLOT 190A Parish OF HUNUA, SPO 190 ALLT 190 PARO Hunua, ALLOT 191 Parish OF HUNUA, ALLOT 197 Parish OF HUNUA
121 MacWhinney Drive	LOT 4 DP 509893
Note: 1. 121 MacWhinney Drive also includes Lot 5 DP 509893 and Lot 1 DP 126627; however, these are excluded from the assessment area.	

The total area (two properties combined) is approximately 258.6 hectares in size; however, the proposed quarry pit extension (which is the focus of this soil characterisation investigation) will be significantly smaller in size (as shown in Figure 1). The remainder of the properties has not been assessed as part of this investigation as they are not expected to be impacted by the proposed quarry pit extension.

4.0 Geology and Hydrogeology

PDP has also been commissioned to advance six boreholes at the site as part of a separate groundwater investigation. A review of the available geological log (refer Appendix A) during this investigation indicates that surface and near-surface soils consist of clay (0-2 m below ground level (bgl)) with clayey/sandy silt (2-6 m bgl) subsurface soils and underlain by greywacke of the Waipapa Group. No groundwater or evidence of surficial fill was encountered in this borehole.

This description is in accordance with the published local geological description, generally consisting of sandy silt, clayey silt, silty sand and sandy gravel, underlain by greywacke (Edbrooke, 2001).

5.0 Sampling Methodology

Site investigation works were undertaken on 9 and 10 February 2022 and comprised the following:

- ✧ Site walkover and visual inspection of the site surface for any evidence of contamination (visual staining or olfactory odour, etc).
- ✧ Surface soil samples were collected at 0.1 and 0.3 m bgl from a total of 20 grid locations across the site (see Figure 1 for sampling location).
 - Samples from ~0.1 m depth are to be representative of topsoil contaminant character;
 - Samples from ~0.3 m depth are to be representative of underlying natural ground.
- ✧ All soil samples were sent to RJ Hill Laboratories Limited (Hills) and select samples were analysed for heavy metals, and selected OCPs and PAHs².

During the completion of soil sample collection, the soils were observed and logged.

² This analytical suite has been determined based on the likelihood of these contaminants potentially being present at the site based on the previous PSI investigations completed for the site. The collected soil samples have not been analysed for asbestos in soil as no fragments of asbestos containing material (ACM) were encountered.

Fresh nitrile gloves were worn, and sample collection equipment was decontaminated at each sample location. Samples were immediately placed into laboratory supplied glass and plastic jars, and chilled cool storage bins for subsequent transport to the IANZ accredited laboratory (Hills) under standard chain-of-custody procedures.

6.0 Applicable Assessment Criteria

The following assessment guidelines and criteria have been selected to enable assessment of the surface and near-surface materials against: the Background Concentrations of heavy metals in the Auckland Region (from the AUP-OP) to demonstrate compliance with the AUP-OP 'cleanfill' definition; and, in addition the nearby Drury Quarry – a Managed Fill facility operated nearby, which is expected to be the preferred facility for surplus soil disposal (if required).

6.1 Regional Background Concentrations

To assess heavy metal results, Auckland Council Background Concentrations for heavy metals are taken from the Non-volcanic Range Soils of Table E30.6.1.4.2 in the AUP-OP.

6.2 Anthropogenic Contaminants

Under the AUP-OP definitions of cleanfill, no concentration of anthropogenic contaminants such as PAHs and OCPs, above the laboratory limit of reporting (LLOR) that can be considered to be 'background'.

6.3 Waste Acceptance Criteria

As the Drury Quarry is the preferred disposal facility for any surplus soils at the site, the waste acceptance criteria as listed in the 'Decision on an application to change/cancel conditions of a resource consent under section 127 of the Resource Management Act 1991' for the Drury Quarry (DIS60083642-A) has been adopted. These values are in line with the AUP-OP Permitted Activity guideline values.

7.0 Results

Results from sampling observations and laboratory soil analyses are outlined below.

7.1 Sampling Observations

The following observations were made during the collection of soil samples:

- ✧ No visual and/or olfactory evidence of contamination were encountered.
- ✧ No fragments of asbestos have been encountered.
- ✧ No evidence of other sources of contamination including fill material were encountered.

7.2 Analytical Results

Laboratory analytical results of the analysed soil samples are summarised in Table 2. The Chain of Custody (CoC) documentation and laboratory analytical reports are provided in Appendix B (note some samples are blanked out as they are part of the Detailed Site Investigation of the area surrounding the farm buildings – not included in this assessment). See Figure 1 for sample locations.

Laboratory analytical results of the 20 analysed soil samples indicates the following:

- ✧ The concentrations of heavy metals in all of the analysed soil samples (excepting SQ_SS31 (0.3) are all within Auckland background ranges.
- ✧ The PAHs and OCPs concentrations in all of the analysed soil samples are below the LLOR.

- ✧ The concentrations of some heavy metals in sample SQ_SS31 (0.3) are above the Auckland background ranges, but within the AUP-OP Permitted Activity soil acceptance criteria.

8.0 Conclusions

A detailed soil characterisation investigation of the surface and near-surface materials (future overburden material) located at the Sutton Block (1189 Ponga Road and 121 MacWhinney Drive), Drury, Auckland confirms that these materials can comply with the AUP-OP definition of 'cleanfill' based on the soil contaminants analysed (i.e. heavy metals, polycyclic aromatic hydrocarbons and organochlorine pesticides).

The key findings of this soil characterisation investigation are as follows:

- ✧ No fill material was encountered.
- ✧ No visual or olfactory evidence of ground contamination were observed in any of the collected soil samples.
- ✧ Majority of sample results comply with the AUP-OP definition of cleanfill.

As a result, all surface and near-surface (i.e. overburden) materials excavated at the site may be re-used onsite, and/or removed offsite to another site or disposal facility at the discretion of the site operator (without restriction from a contamination perspective).

Based on the sample results and history review included in the referenced reports, the overburden material, excluding soil surrounding sample SQ_SS31(0.3) can be effectively classed as clean fill material (for the particular contaminants assessed).

Soil surrounding sample location SQ_SS31(0.3) cannot be considered as clean fill material but can be reused at the site. However, if removal of surface soils from this area is required, the soil in this location must be disposed as 'managed fill' to an appropriately licensed disposal facility (e.g. Drury Quarry).

It is noted that further AUP-OP rules with respect to trafficking soils have not been included in this assessment (i.e. permitted volumes, erosion and sediment controls and/or consent requirements, etc).

9.0 References

AUP:OP, 2021. Auckland Unitary Plan; Operative in Part. Updated March 2021. Auckland Council.

Edbrooke, S.W. (compiler) 2001: Geology of the Auckland area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences Limited. Institute of Geological & Nuclear Sciences 1:250,000 geological map 3. 74 p. + 1 folded map

MfE, 2021a. *Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand*. Ministry for the Environment.

MfE, 2021b. *Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils*. Ministry for the Environment.

PDP, 2024. *Updated - Sutton Block Extension to Drury Quarry – Preliminary Site Investigation*. Pattle Delamore Partners.

T+T, in preparation. *Drury Quarry, Sutton Block, Assessment of Environmental Effects*. Tonkin + Taylor.

10.0 Limitations

This document has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Stevenson Aggregates Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the document. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This document has been prepared based on the collection and laboratory analysis of 19 soil samples from 20 locations within the site for heavy metals, OCPs and/or PAHs. The site conditions as described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full site conditions.

This assessment is limited to collection and analysis of soil samples from discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

The information contained within this document applies to soil sampling undertaken on the dates stated in this document, or if none is stated, the date of this document. With time, the site conditions and environmental standards may change. Accordingly, the reported assessments and conclusions are not guaranteed to apply at a later date.

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Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

PP 

Myra Belkot

Environmental Scientist

Reviewed by



Stefan Yap

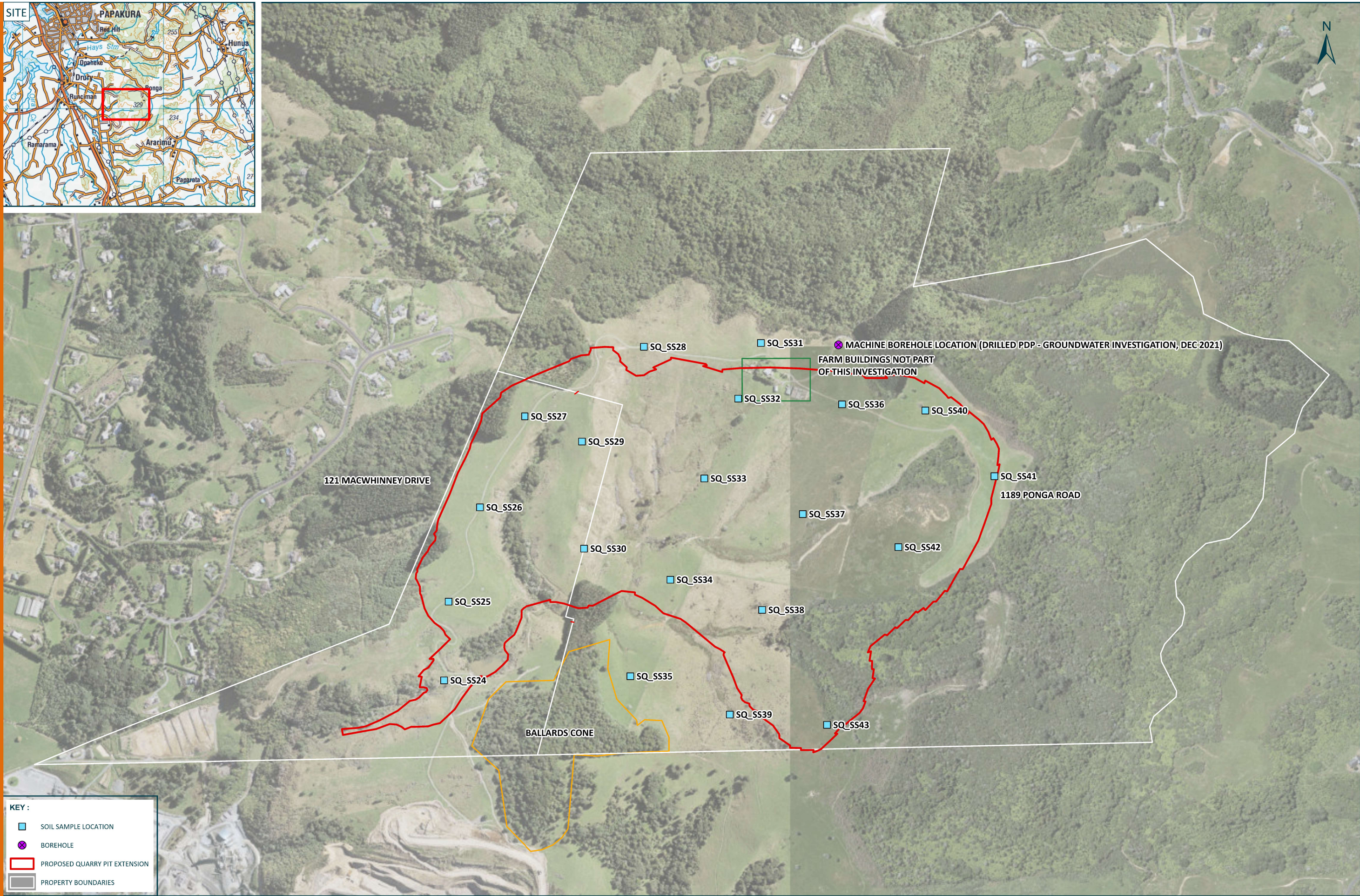
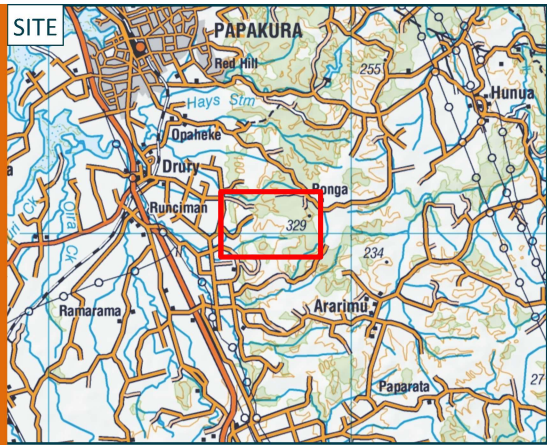
Service Leader – Contaminated Land

Approved by



Rod Lidgard – CEnvP (SC)

Technical Director – Contaminated Land



KEY :

- SOIL SAMPLE LOCATION
- BOREHOLE
- PROPOSED QUARRY PIT EXTENSION
- PROPERTY BOUNDARIES



0 100 200
METRES
SCALE : 1:8,500 (A3)

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D	FINAL	JAN 24	ME
C	ISSUED FOR REVIEW	OCT 23	TK
B	ISSUED FOR REVIEW	MAR 22	TK
A	ISSUED FOR REVIEW	DEC 21	TK
NO.	REVISION	DATE	BY

SOURCE:
1. AERIAL IMAGERY (FLOWN 2017) SOURCED FROM THE LINZ DATA SERVICE www.linz.govt.nz/about-linz-data-service/help/using-linz-data-attributing-aerial-imagery-data AND LICENCED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.
2. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.
3. BALLARDS CONE AND FUTURE QUARRY PT EXTENSION BOUNDARIES DERIVED FROM PLANS PROVIDED BY CLIENT.

CLIENT

STEVENSON

FIGURE
FIG 1: SAMPLE LOCATION PLAN

PROJECT
UPDATED - SUTTON BLOCK EXTENSION TO DRURY QUARRY – CLEANFILL ASSESSMENT

Appendix A: Geological Log

MONITORING WELL

Job No.: A02447709

Test No.: SG11D

Sheet: 1 of 5

Date: 10/12/21

Ground Level mRL:

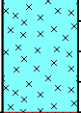
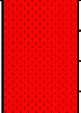
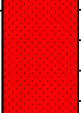
Ground

Client:
Stevenson Aggregates Ltd

Project:
Sutton Quarry

Site Address:
Quarry Road, Runciman 2578

Coordinates:
1777717.2mE, 5890562.6mN

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PLD (ppm)	Samples	Depth Remarks	Installation	Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.								
	CLAY, with some silt; orange brown. Dry, moderate plasticity.								
	Clayey SILT; brown with minor orange mottling. Dry, low plasticity; inclusion of fine sand (likely from bottom of sample).								
	SILT, with some sand, with trace clay; brown. Dry, non-plastic; sand, fine.								
	Sandy SILT; brown. Dry; sand, fine.								
	Completely weathered; grey; SANDSTONE; contains fine sandy/silt matrix [Greywacke].								
	18.0m: colour change to grey blue								
	24.0m: fine sandy/silt matrix decreases								
	26.0m: some chips contain stained orange/oxidation in samples from this depth onwards								
	28.5m: Small fracture at 28.5 m								
	29.0m: Moisture in samples first recorded at 29 m								
	30.0m: fine sandy/silt matrix changes from grey to brown between 30 to 32 m								
	Moderately weathered; grey blue; SANDSTONE; some chips contain stained orange/oxidation [Greywacke].								
	38.0m: some chips contain stained orange/oxidation and white calcite veins in samples from this depth onwards								
	39.5m: Small fracture at 39.5 m								
	Unweathered; grey blue; SANDSTONE; some chips contain stained orange/oxidation and white calcite veins in samples [Greywacke]..								
	42.0m: Flowing water during drilling from 42 m - beginning of fractured Greywacke								
	46.0m: contains fine sandy/silt matrix changes from 46 to 48 m								
Remarks								Investigation Type	Water
Reverse air blasting (RAB) from 0 to 19.5 Downhole hammer from 19.5 to Soil samples taken at 2 m intervals								☐ Hand Auger ☐ Test Pit ☒ Machine Hole	 Standing Water Level  In flow  Out flow
Contractor: Drillforce Ltd.	Rig/Plant Used: Truck mounted - air hammer	Driller:	Logged By: LG	Checked By:	Hole Depth: 250.00 m				

Groundwater Not Encountered

Client:
Stevenson Aggregates Ltd

Project:
Sutton Quarry

Site Address:
Quarry Road, Runciman 2578
Coordinates:
1777717.2mE, 5890562.6mN

[illegible]

Client:
Stevenson Aggregates Ltd

Project:
Sutton Quarry

Site Address:
Quarry Road, Runciman 2578
Coordinates:
1777717.2mE, 5890562.6mN

Interpretation	Geological Description Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation		Water
								Investigation Type ☐ Hand Auger ☐ Test Pit ☒ Machine Hole ▼ Standing Water Level ↰ In flow ↱ Out flow		Water
Contractor: Drillforce Ltd.		Rig/Plant Used: Truck mounted - air hammer		Driller:		Logged By: LG		Checked By:		Hole Depth: 250.00 m

Appendix B: Laboratory Report



Hill Laboratories

TRIED, TESTED AND TRUSTED

Quote No

Primary Contact Rod Lidgard

Submitted By Myra Belkot

Client Name Pattle Delamore Partners Limited

Address PO BOX 9528 Newmarket

Auckland 1149

Phone Mobile 0223026110

Email

Charge To PDP

Client Reference A02447108

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 Myra.belkot@pdp.co.nz

☒ Other Rod.lidgard@pdp.co.nz

ANALYSIS REQUEST

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

Job No: Date Recv: 09-Feb-22 17:15

286 2111

Received by: Sanaya Hansotia



3128621119

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

W www.hill-laboratories.com

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories Date & Time:

Tick if you require COC

☒ to be emailed back Signature:

Received at Hill Laboratories Date & Time:

(Refer to Lab created Job No above)

Name:

Signature:

Condition

Room Temp

Chilled

Frozen

Temp:

☐

☐

☐

14-0

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	SQ_SS01	09 /01/2022	—	S	Hold cold
2	SQ_SS02	09 /01/2022	—	S	
3	SQ_SS03	09 /01/2022	—	S	
4	SQ_SS04	/01/2022 09 /02/22	—	S	
5	SQ_SS05	/01/2022	—	S	
6	SQ_SS06	/01/2022	—	S	

7	SQ_SS07	9 /02/2022	S	HOLD Cold
8	SQ_SS08	9 /01/2022	S	
9	SQ_SS09	9 /01/2022	S	
10	SQ_SS10	/01/2022	S	
11	SQ_SS11	/01/2022	S	
12	SQ_SS12	/01/2022	S	
13	SQ_SS13	/01/2022	S	
14	SQ_SS14	/01/2022	S	
15	SQ_SS15	/01/2022	S	
16	SQ_SS16	/01/2022	S	
17	SQ_SS17	/01/2022	S	
18	SQ_SS18	/01/2022	S	
19	SQ_SS19	/01/2022	S	
20	SQ_SS20	/01/2022	S	
21	SQ_SS21	/01/2022	S	
22	SQ_SS22	/01/2022	S	
23	SQ_SS23	/01/2022	S	
24	SQ_SS24 01 (0.3)	/01/2022	S	
25	SQ_SS25 03 (0.3)	/01/2022	S	
26	SQ_SS26 04 (0.3)	/01/2022	S	
27	SQ_SS27 06 (0.2)	/01/2022	S	
28	SQ_SS28 08 (0.3)	/01/2022	S	
29	SQ_SS29 10 (0.25)	/01/2022	S	
30	SQ_SS30 12 (0.2)	/01/2022	S	
31	SQ_SS31 14 (0.25)	/01/2022	S	
32	SQ_SS32 16 (0.3)	/01/2022	S	
33	SQ_SS33 19 (0.3)	/01/2022	S	
34	SQ_SS34 22 (0.3)	/01/2022	S	
35	SQ_SS35 28 (0.3)	/01/2022	S	



Job Information Summary

Page 1 of 1

Client:	Pattle Delamore Partners Limited	Lab No:	2862111
Contact:	R Lidgard	Date Registered:	10-Feb-2022 5:49 pm
	C/- Pattle Delamore Partners Limited	Priority:	High
	PO Box 9528	Quote No:	81087
	Newmarket	Order No:	
	Auckland 1149	Client Reference:	A02447108
		Add. Client Ref:	
		Submitted By:	Myra Belkot
		Charge To:	Pattle Delamore Partners Limited
		Target Date:	14-Feb-2022 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	SQ_SS01 09-Feb-2022	Soil	cGSoil	Hold Cold
2	SQ_SS02 09-Feb-2022	Soil	GSoil300	Hold Cold
3	SQ_SS03 09-Feb-2022	Soil	GSoil300	Hold Cold
4	SQ_SS04 09-Feb-2022	Soil	GSoil300	Hold Cold
5	SQ_SS05 09-Feb-2022	Soil	GSoil300	Hold Cold
6	SQ_SS06 09-Feb-2022	Soil	GSoil300	Hold Cold
7	SQ_SS07 09-Feb-2022	Soil	GSoil300	Hold Cold
8	SQ_SS08 09-Feb-2022	Soil	GSoil300	Hold Cold
9	SQ_SS09 09-Feb-2022	Soil	GSoil300	Hold Cold
10	SQ_SS10 09-Feb-2022	Soil	GSoil300	Hold Cold
11	SQ_SS11 09-Feb-2022	Soil	GSoil300	Hold Cold
12	SQ_SS12 09-Feb-2022	Soil	GSoil300	Hold Cold
13	SQ_SS13 09-Feb-2022	Soil	GSoil300	Hold Cold
14	SQ_SS14 09-Feb-2022	Soil	GSoil300	Hold Cold
15	SQ_SS15 09-Feb-2022	Soil	cGSoil	Hold Cold
16	SQ_SS16 09-Feb-2022	Soil	GSoil300	Hold Cold
17	SQ_SS17 09-Feb-2022	Soil	GSoil300	Hold Cold
18	SQ_SS18 09-Feb-2022	Soil	GSoil300	Hold Cold
19	SQ_SS19 09-Feb-2022	Soil	GSoil300	Hold Cold
20	SQ_SS20 09-Feb-2022	Soil	GSoil300	Hold Cold
21	SQ_SS21 09-Feb-2022	Soil	cGSoil	Hold Cold
22	SQ_SS22 09-Feb-2022	Soil	GSoil300	Hold Cold
23	SQ_SS23 09-Feb-2022	Soil	cGSoil	Hold Cold
24	SQ_SS01 (0.3) 09-Feb-2022	Soil	GSoil300	Hold Cold
25	SQ_SS03 (0.3) 09-Feb-2022	Soil	GSoil300	Hold Cold
26	SQ_SS04 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
27	SQ_SS06 (0.2) 09-Feb-2022	Soil	cGSoil	Hold Cold
28	SQ_SS08 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
29	SQ_SS10 (0.25) 09-Feb-2022	Soil	cGSoil	Hold Cold
30	SQ_SS12 (0.2) 09-Feb-2022	Soil	cGSoil	Hold Cold
31	SQ_SS14 (0.25) 09-Feb-2022	Soil	cGSoil	Hold Cold
32	SQ_SS16 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
33	SQ_SS19 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
34	SQ_SS22 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
35	SQ_SS28 (0.3) 09-Feb-2022	Soil	cGSoil	Hold Cold
36	SQ_SS28 09-Feb-2022	Soil	cGSoil	Hold Cold



Certificate of Analysis

Page 1 of 4

Client:	Pattle Delamore Partners Limited	Lab No:	2862111	SPV3
Contact:	R Lidgard	Date Received:	09-Feb-2022	
	C/- Pattle Delamore Partners Limited	Date Reported:	24-Feb-2022	
	PO Box 9528	Quote No:	81087	
	Newmarket	Order No:		
	Auckland 1149	Client Reference:	A02447108	
		Submitted By:	Myra Belkot	

Sample Type: Soil

Sample Name:	
Lab Number:	
Individual Tests	
Dry Matter	g/100g as rcvd
Total Recoverable Lead	mg/kg dry wt
Heavy Metals, Screen Level	
Total Recoverable Arsenic	mg/kg dry wt
Total Recoverable Cadmium	mg/kg dry wt
Total Recoverable Chromium	mg/kg dry wt
Total Recoverable Copper	mg/kg dry wt
Total Recoverable Lead	mg/kg dry wt
Total Recoverable Nickel	mg/kg dry wt
Total Recoverable Zinc	mg/kg dry wt
Organochlorine Pesticides Screening in Soil	
Aldrin	mg/kg dry wt
alpha-BHC	mg/kg dry wt
beta-BHC	mg/kg dry wt
delta-BHC	mg/kg dry wt
gamma-BHC (Lindane)	mg/kg dry wt
cis-Chlordane	mg/kg dry wt
trans-Chlordane	mg/kg dry wt
2,4'-DDD	mg/kg dry wt
4,4'-DDD	mg/kg dry wt
2,4'-DDE	mg/kg dry wt
4,4'-DDE	mg/kg dry wt
2,4'-DDT	mg/kg dry wt
4,4'-DDT	mg/kg dry wt
Total DDT Isomers	mg/kg dry wt
Dieldrin	mg/kg dry wt
Endosulfan I	mg/kg dry wt
Endosulfan II	mg/kg dry wt
Endosulfan sulphate	mg/kg dry wt
Endrin	mg/kg dry wt
Endrin aldehyde	mg/kg dry wt
Endrin ketone	mg/kg dry wt
Heptachlor	mg/kg dry wt
Heptachlor epoxide	mg/kg dry wt
Hexachlorobenzene	mg/kg dry wt
Methoxychlor	mg/kg dry wt



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Sample Type: Soil		
Sample Name:		
Lab Number:		
Individual Tests		
Total Recoverable Lead	mg/kg dry wt	
Sample Name:		
Lab Number:		
Individual Tests		
Dry Matter	g/100g as rcvd	
Total Recoverable Lead	mg/kg dry wt	
Heavy Metals, Screen Level		
Total Recoverable Arsenic	mg/kg dry wt	
Total Recoverable Cadmium	mg/kg dry wt	
Total Recoverable Chromium	mg/kg dry wt	
Total Recoverable Copper	mg/kg dry wt	
Total Recoverable Lead	mg/kg dry wt	
Total Recoverable Nickel	mg/kg dry wt	
Total Recoverable Zinc	mg/kg dry wt	
Organochlorine Pesticides Screening in Soil		
Aldrin	mg/kg dry wt	
alpha-BHC	mg/kg dry wt	
beta-BHC	mg/kg dry wt	
delta-BHC	mg/kg dry wt	
gamma-BHC (Lindane)	mg/kg dry wt	
cis-Chlordane	mg/kg dry wt	
trans-Chlordane	mg/kg dry wt	
2,4'-DDD	mg/kg dry wt	
4,4'-DDD	mg/kg dry wt	
2,4'-DDE	mg/kg dry wt	
4,4'-DDE	mg/kg dry wt	
2,4'-DDT	mg/kg dry wt	
4,4'-DDT	mg/kg dry wt	
Total DDT Isomers	mg/kg dry wt	
Dieldrin	mg/kg dry wt	
Endosulfan I	mg/kg dry wt	
Endosulfan II	mg/kg dry wt	
Endosulfan sulphate	mg/kg dry wt	
Endrin	mg/kg dry wt	
Endrin aldehyde	mg/kg dry wt	
Endrin ketone	mg/kg dry wt	
Heptachlor	mg/kg dry wt	
Heptachlor epoxide	mg/kg dry wt	
Hexachlorobenzene	mg/kg dry wt	
Methoxychlor	mg/kg dry wt	
Polycyclic Aromatic Hydrocarbons Screening in Soil*		
Total of Reported PAHs in Soil	mg/kg dry wt	
1-Methylnaphthalene	mg/kg dry wt	
2-Methylnaphthalene	mg/kg dry wt	
Acenaphthylene	mg/kg dry wt	
Acenaphthene	mg/kg dry wt	
Anthracene	mg/kg dry wt	
Benzo[a]anthracene	mg/kg dry wt	
Benzo[a]pyrene (BAP)	mg/kg dry wt	
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	

Sample Type: Soil			
Sample Name:			SQ_SS28 09-Feb-2022
Lab Number:			2862111.36
Polycyclic Aromatic Hydrocarbons Screening in Soil*			
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt		< 0.012
Benzo[e]pyrene	mg/kg dry wt		< 0.012
Benzo[g,h,i]perylene	mg/kg dry wt		< 0.012
Benzo[k]fluoranthene	mg/kg dry wt		< 0.012
Chrysene	mg/kg dry wt		< 0.012
Dibenzo[a,h]anthracene	mg/kg dry wt		< 0.012
Fluoranthene	mg/kg dry wt		< 0.012
Fluorene	mg/kg dry wt		< 0.012
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt		< 0.012
Naphthalene	mg/kg dry wt		< 0.06
Perylene	mg/kg dry wt		< 0.012
Phenanthrene	mg/kg dry wt		< 0.012
Pyrene	mg/kg dry wt		< 0.012

Analyst's Comments

The matrix of samples 2862111.36 has affected the System Monitoring Compounds 1-methylnaphthalene-d10, Fluoranthene-d10 and Benzo[a]pyrene-d12 in the PAH analysis, whereby the recoveries ranged from 60%-65%. Therefore the results may be underestimated.

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%.	-	1-4, 6, 8, 10, 12, 14, 16, 18-19, 21-22, 36
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%.	-	4, 6, 8, 10, 12, 14, 16, 18-19, 21-22
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	36
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, 36
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1-3, 36
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	36
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-3, 36
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	4, 6, 8, 10, 12, 14, 16, 18-19, 21-22
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	4, 6, 8, 10, 12, 14, 16, 18-19, 21-22
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	36

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	36

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

Testing was completed between 17-Feb-2022 and 24-Feb-2022. 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.

Ara Heron BSc (Tech)
Client Services Manager - Environmental



ANALYSIS REQUEST

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

Job No: Date Recv: 10-Feb-22 16:53

286 4529

Received by: Sanaya Hansotia



3128645298

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

W www.hill-laboratories.com

CHAIN OF CUSTODY RECORD

Sent to **Hill Laboratories** Date & Time:

Tick if you require COC Name:

☒ to be emailed back Signature:

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

(Refer to Lab created Job No above) Name:

Signature:

Condition Temp:

☐ Room Temp ☒ Chilled ☐ Frozen

13-0

Quote No

Primary Contact Rod Lidgard

Submitted By Myra Belkot

Client Name Pattle Delamore Partners Limited

Address PO BOX 9528 Newmarket

Auckland 1149

Phone Mobile 0223026110

Email

Charge To PDP

Client Reference A02447108

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 Myra.belkot@pdp.co.nz;

☒ Other Rod.lidgard@pdp.co.nz

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	SQ_SS01 25 5525 SQ_SS24	10/01/2022		S	HC
2	SQ_SS02 25 5525 SQ_SS24 (0.3)	/01/2022		S	
3	SQ_SS03 25	/01/2022		S	
4	SQ_SS04 25 (0.25)	/01/2022		S	
5	SQ_SS05 26	/01/2022		S	
6	SQ_SS06 26 (0.1)	/01/2022		S	

7	SQ_SS07 27	10/01/2022	S	HC
8	SQ_SS08 27 (0.3)	/01/2022	S	
9	SQ_SS09 27	/01/2022	S	
10	SQ_SS10 30	/01/2022	S	
11	SQ_SS11 30 (0.2)	/01/2022	S	
12	SQ_SS12 31	/01/2022	S	
13	SQ_SS13 31 (0.3)	/01/2022	S	
14	SQ_SS14 32	/01/2022	S	
15	SQ_SS15 32 (0.3)	/01/2022	S	
16	SQ_SS16 33	/01/2022	S	
17	SQ_SS17 33 (0.3)	/01/2022	S	
18	SQ_SS18 34	/01/2022	S	
19	SQ_SS19 34 (0.3)	/01/2022	S	
20	SQ_SS20 35	/01/2022	S	
21	SQ_SS21 35 (0.3)	/01/2022	S	
22	SQ_SS22 36	/01/2022	S	
23	SQ_SS23 36 (0.3)	/01/2022	S	
24	SQ_SS24 37	/01/2022	S	
25	SQ_SS25 37 (0.3)	/01/2022	S	
26	SQ_SS26 38	/01/2022	S	
27	SQ_SS27 38 (0.3)	/01/2022	S	
28	SQ_SS28 39	/01/2022	S	
29	SQ_SS29 39 (0.3)	/01/2022	S	
30	SQ_SS30 40	/01/2022	S	
31	SQ_SS31 40 (0.3)	/01/2022	S	
32	SQ_SS32 41	/01/2022	S	
33	SQ_SS33 41 (0.3)	/01/2022	S	
34	SQ_SS34 42	/01/2022	S	
35	SQ_SS35 42 (0.3)	✓ /01/2022	S	

36	SQ_SS36 43	10/01/2022	S	Hc
37	SQ_SS37 43 (0.3)	/01/2022	S	
38	SQ_SS38 08	/01/2022	S	
39	SQ_SS39 08 (0.8)	/01/2022	S	
40	SQ_SS40 09	/01/2022	S	
41	SQ_SS41	/01/2022	S	
42	SQ_SS42	/01/2022	S	
43	SQ_SS43	/01/2022	S	
44	SQ_SS44	/01/2022	S	
45	SQ_SS45	/01/2022	S	
46	SQ_SS46	/01/2022	S	
47	SQ_SS47	/01/2022	S	
48	SQ_SS48	/01/2022	S	
49	SQ_SS49	/01/2022	S	
50	SQ_SS50	/01/2022	S	
51	SQ_SS51	/01/2022	S	
52	SQ_SS52	/01/2022	S	
53	SQ_SS53	/01/2022	S	
54	SQ_SS54	/01/2022	S	
55	SQ_SS55	/01/2022	S	
56	SQ_SS56	/01/2022	S	
57	SQ_SS57	/01/2022	S	
58	SQ_SS58	/01/2022	S	
59	SQ_SS59	/01/2022	S	
60	SQ_SS60	/01/2022	S	
61	SQ_SS61	/01/2022	S	
62	SQ_SS62	/01/2022	S	
63	SQ_SS63	/01/2022	S	
64	SQ_SS634	/01/2022	S	



Job Information Summary

Page 1 of 1

Client:	Pattle Delamore Partners Limited	Lab No:	2864529
Contact:	R Lidgard	Date Registered:	11-Feb-2022 2:27 pm
	C/- Pattle Delamore Partners Limited	Priority:	High
	PO Box 9528	Quote No:	81087
	Newmarket	Order No:	
	Auckland 1149	Client Reference:	A02447108
		Add. Client Ref:	Sampled: 10/02/22
		Submitted By:	Myra Belkot
		Charge To:	Pattle Delamore Partners Limited
		Target Date:	15-Feb-2022 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	SQ_SS24 10-Feb-2022	Soil	cGSoil	Hold Cold
2	SQ_SS24 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
3	SQ_SS25 10-Feb-2022	Soil	GSoil300	Hold Cold
4	SQ_SS25 (0.25) 10-Feb-2022	Soil	GSoil300	Hold Cold
5	SQ_SS26 10-Feb-2022	Soil	cGSoil	Hold Cold
6	SQ_SS26 (0.1) 10-Feb-2022	Soil	GSoil300	Hold Cold
7	SQ_SS27 10-Feb-2022	Soil	GSoil300	Hold Cold
8	SQ_SS27 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold
9	SQ_SS29 10-Feb-2022	Soil	cGSoil	Hold Cold
10	SQ_SS30 10-Feb-2022	Soil	cGSoil	Hold Cold
11	SQ_SS30 (0.2) 10-Feb-2022	Soil	cGSoil	Hold Cold
12	SQ_SS31 10-Feb-2022	Soil	GSoil300	Hold Cold
13	SQ_SS31 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold
14	SQ_SS32 10-Feb-2022	Soil	GSoil300	Hold Cold
15	SQ_SS32 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold
16	SQ_SS33 10-Feb-2022	Soil	GSoil300	Hold Cold
17	SQ_SS33 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
18	SQ_SS34 10-Feb-2022	Soil	cGSoil	Hold Cold
19	SQ_SS34 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
20	SQ_SS35 10-Feb-2022	Soil	GSoil300	Hold Cold
21	SQ_SS35 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
22	SQ_SS36 10-Feb-2022	Soil	GSoil300	Hold Cold
23	SQ_SS36 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
24	SQ_SS37 10-Feb-2022	Soil	GSoil300	Hold Cold
25	SQ_SS37 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
26	SQ_SS38 10-Feb-2022	Soil	GSoil300	Hold Cold
27	SQ_SS38 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold
28	SQ_SS39 10-Feb-2022	Soil	GSoil300	Hold Cold
29	SQ_SS39 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
30	SQ_SS40 10-Feb-2022	Soil	GSoil300	Hold Cold
31	SQ_SS40 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
32	SQ_SS41 10-Feb-2022	Soil	cGSoil	Hold Cold
33	SQ_SS41 (0.3) 10-Feb-2022	Soil	GSoil300	Hold Cold
34	SQ_SS42 10-Feb-2022	Soil	GSoil300	Hold Cold
35	SQ_SS42 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold
36	SQ_SS43 10-Feb-2022	Soil	GSoil300	Hold Cold
37	SQ_SS43 (0.3) 10-Feb-2022	Soil	cGSoil	Hold Cold



Certificate of Analysis

Page 1 of 7

Client:	Pattle Delamore Partners Limited	Lab No:	2864529	SPv1
Contact:	R Lidgard	Date Received:	10-Feb-2022	
	C/- Pattle Delamore Partners Limited	Date Reported:	23-Feb-2022	
	PO Box 9528	Quote No:	81087	
	Newmarket	Order No:		
	Auckland 1149	Client Reference:	A02447108	
		Submitted By:	Myra Belkot	

Sample Type: Soil

Sample Name:	SQ_SS24 10-Feb-2022	SQ_SS25 (0.25) 10-Feb-2022	SQ_SS26 10-Feb-2022	SQ_SS27 (0.3) 10-Feb-2022	SQ_SS29 10-Feb-2022
Lab Number:	2864529.1	2864529.4	2864529.5	2864529.8	2864529.9

Individual Tests

Dry Matter	g/100g as rcvd	73	-	85	76	-
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Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	7	2	10	4	8
Total Recoverable Cadmium	mg/kg dry wt	0.25	0.15	0.38	0.17	0.20
Total Recoverable Chromium	mg/kg dry wt	26	7	13	7	20
Total Recoverable Copper	mg/kg dry wt	17	3	8	6	14
Total Recoverable Lead	mg/kg dry wt	11.7	4.7	7.3	6.2	10.6
Total Recoverable Nickel	mg/kg dry wt	12	< 2	4	< 2	13
Total Recoverable Zinc	mg/kg dry wt	71	11	28	10	60

Organochlorine Pesticides Screening in Soil

Aldrin	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
alpha-BHC	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
beta-BHC	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
delta-BHC	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
cis-Chlordane	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
trans-Chlordane	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
2,4'-DDD	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
4,4'-DDD	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
2,4'-DDE	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
4,4'-DDE	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
2,4'-DDT	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
4,4'-DDT	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Total DDT Isomers	mg/kg dry wt	< 0.09	-	< 0.07	< 0.08	-
Dieldrin	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endosulfan I	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endosulfan II	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endrin	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endrin aldehyde	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Endrin ketone	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Heptachlor	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Methoxychlor	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-



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Sample Type: Soil						
Sample Name:		SQ_SS24 10-Feb-2022	SQ_SS25 (0.25) 10-Feb-2022	SQ_SS26 10-Feb-2022	SQ_SS27 (0.3) 10-Feb-2022	SQ_SS29 10-Feb-2022
Lab Number:		2864529.1	2864529.4	2864529.5	2864529.8	2864529.9
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	< 0.3	< 0.4	-
1-Methylnaphthalene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Acenaphthylene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Acenaphthene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Anthracene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[a]anthracene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	-	< 0.03	< 0.04	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	-	< 0.03	< 0.04	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[e]pyrene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Chrysene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Fluoranthene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Fluorene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Naphthalene	mg/kg dry wt	< 0.07	-	< 0.06	< 0.07	-
Perylene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Phenanthrene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Pyrene	mg/kg dry wt	< 0.014	-	< 0.012	< 0.013	-
Sample Name:		SQ_SS30 10-Feb-2022	SQ_SS31 (0.3) 10-Feb-2022	SQ_SS32 10-Feb-2022	SQ_SS33 (0.3) 10-Feb-2022	SQ_SS34 10-Feb-2022
Lab Number:		2864529.10	2864529.13	2864529.14	2864529.17	2864529.18
Individual Tests						
Dry Matter	g/100g as rcvd	-	78	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	12	69	3	3	6
Total Recoverable Cadmium	mg/kg dry wt	0.16	0.37	< 0.10	< 0.10	0.20
Total Recoverable Chromium	mg/kg dry wt	17	38	5	7	17
Total Recoverable Copper	mg/kg dry wt	14	68	3	4	12
Total Recoverable Lead	mg/kg dry wt	10.3	156	8.1	6.1	21
Total Recoverable Nickel	mg/kg dry wt	11	9	< 2	< 2	9
Total Recoverable Zinc	mg/kg dry wt	55	230	25	7	20
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.013	-	-	-
alpha-BHC	mg/kg dry wt	-	< 0.013	-	-	-
beta-BHC	mg/kg dry wt	-	< 0.013	-	-	-
delta-BHC	mg/kg dry wt	-	< 0.013	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.013	-	-	-
cis-Chlordane	mg/kg dry wt	-	< 0.013	-	-	-
trans-Chlordane	mg/kg dry wt	-	< 0.013	-	-	-
2,4'-DDD	mg/kg dry wt	-	< 0.013	-	-	-
4,4'-DDD	mg/kg dry wt	-	< 0.013	-	-	-
2,4'-DDE	mg/kg dry wt	-	< 0.013	-	-	-
4,4'-DDE	mg/kg dry wt	-	< 0.013	-	-	-
2,4'-DDT	mg/kg dry wt	-	< 0.013	-	-	-
4,4'-DDT	mg/kg dry wt	-	< 0.013	-	-	-
Total DDT Isomers	mg/kg dry wt	-	< 0.08	-	-	-
Dieldrin	mg/kg dry wt	-	< 0.013	-	-	-
Endosulfan I	mg/kg dry wt	-	< 0.013	-	-	-

Sample Type: Soil						
Sample Name:		SQ_SS30 10-Feb-2022	SQ_SS31 (0.3) 10-Feb-2022	SQ_SS32 10-Feb-2022	SQ_SS33 (0.3) 10-Feb-2022	SQ_SS34 10-Feb-2022
Lab Number:		2864529.10	2864529.13	2864529.14	2864529.17	2864529.18
Organochlorine Pesticides Screening in Soil						
Endosulfan II	mg/kg dry wt	-	< 0.013	-	-	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.013	-	-	-
Endrin	mg/kg dry wt	-	< 0.013	-	-	-
Endrin aldehyde	mg/kg dry wt	-	< 0.013	-	-	-
Endrin ketone	mg/kg dry wt	-	< 0.013	-	-	-
Heptachlor	mg/kg dry wt	-	< 0.013	-	-	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.013	-	-	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.013	-	-	-
Methoxychlor	mg/kg dry wt	-	< 0.013	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.4	-	-	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.013	-	-	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.013	-	-	-
Acenaphthylene	mg/kg dry wt	-	< 0.013	-	-	-
Acenaphthene	mg/kg dry wt	-	< 0.013	-	-	-
Anthracene	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[a]anthracene	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.04	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.04	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[e]pyrene	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.013	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.013	-	-	-
Chrysene	mg/kg dry wt	-	< 0.013	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.013	-	-	-
Fluoranthene	mg/kg dry wt	-	< 0.013	-	-	-
Fluorene	mg/kg dry wt	-	< 0.013	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.013	-	-	-
Naphthalene	mg/kg dry wt	-	< 0.07	-	-	-
Perylene	mg/kg dry wt	-	< 0.013	-	-	-
Phenanthrene	mg/kg dry wt	-	< 0.013	-	-	-
Pyrene	mg/kg dry wt	-	< 0.013	-	-	-
Sample Name:		SQ_SS35 (0.3) 10-Feb-2022	SQ_SS36 10-Feb-2022	SQ_SS37 (0.3) 10-Feb-2022	SQ_SS38 10-Feb-2022	SQ_SS39 (0.3) 10-Feb-2022
Lab Number:		2864529.21	2864529.22	2864529.25	2864529.26	2864529.29
Individual Tests						
Dry Matter	g/100g as rcvd	75	-	-	-	75
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	3	2	4
Total Recoverable Cadmium	mg/kg dry wt	0.10	0.20	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	32	6	7	10	10
Total Recoverable Copper	mg/kg dry wt	10	5	4	< 2	8
Total Recoverable Lead	mg/kg dry wt	16.0	13.8	13.1	7.0	12.7
Total Recoverable Nickel	mg/kg dry wt	9	3	3	3	< 2
Total Recoverable Zinc	mg/kg dry wt	23	25	13	12	16
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	-	-	-	< 0.014
alpha-BHC	mg/kg dry wt	< 0.013	-	-	-	< 0.014
beta-BHC	mg/kg dry wt	< 0.013	-	-	-	< 0.014
delta-BHC	mg/kg dry wt	< 0.013	-	-	-	< 0.014
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	-	-	-	< 0.014

Sample Type: Soil						
Sample Name:		SQ_SS35 (0.3) 10-Feb-2022	SQ_SS36 10-Feb-2022	SQ_SS37 (0.3) 10-Feb-2022	SQ_SS38 10-Feb-2022	SQ_SS39 (0.3) 10-Feb-2022
Lab Number:		2864529.21	2864529.22	2864529.25	2864529.26	2864529.29
Organochlorine Pesticides Screening in Soil						
cis-Chlordane	mg/kg dry wt	< 0.013	-	-	-	< 0.014
trans-Chlordane	mg/kg dry wt	< 0.013	-	-	-	< 0.014
2,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	< 0.014
4,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	< 0.014
2,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	< 0.014
4,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	< 0.014
2,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	< 0.014
4,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Total DDT Isomers	mg/kg dry wt	< 0.08	-	-	-	< 0.08
Dieldrin	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endosulfan I	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endosulfan II	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endosulfan sulphate	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endrin	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endrin aldehyde	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Endrin ketone	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Heptachlor	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Heptachlor epoxide	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Hexachlorobenzene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Methoxychlor	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	-	-	-	< 0.4
1-Methylnaphthalene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
2-Methylnaphthalene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Acenaphthylene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Acenaphthene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Anthracene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[a]anthracene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	-	-	-	< 0.04
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	-	-	-	< 0.04
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[e]pyrene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Chrysene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Fluoranthene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Fluorene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Naphthalene	mg/kg dry wt	< 0.07	-	-	-	< 0.07
Perylene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Phenanthrene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Pyrene	mg/kg dry wt	< 0.013	-	-	-	< 0.014
Sample Name:		SQ_SS40 10-Feb-2022	SQ_SS41 (0.3) 10-Feb-2022	SQ_SS42 10-Feb-2022	SQ_SS43 (0.3) 10-Feb-2022	
Lab Number:		2864529.30	2864529.33	2864529.34	2864529.37	
Individual Tests						
Dry Matter	g/100g as rcvd	79	81	78	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	2	3	3	-
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.11	< 0.10	0.12	-
Total Recoverable Chromium	mg/kg dry wt	37	12	12	12	-

Sample Type: Soil						
Sample Name:		SQ_SS40 10-Feb-2022	SQ_SS41 (0.3) 10-Feb-2022	SQ_SS42 10-Feb-2022	SQ_SS43 (0.3) 10-Feb-2022	
Lab Number:		2864529.30	2864529.33	2864529.34	2864529.37	
Heavy Metals, Screen Level						
Total Recoverable Copper	mg/kg dry wt	10	4	5	4	-
Total Recoverable Lead	mg/kg dry wt	19.4	11.8	13.6	11.3	-
Total Recoverable Nickel	mg/kg dry wt	8	3	2	3	-
Total Recoverable Zinc	mg/kg dry wt	24	17	18	21	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
alpha-BHC	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
beta-BHC	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
delta-BHC	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	< 0.08	-	-
Dieldrin	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endosulfan I	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endosulfan II	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endrin	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Endrin ketone	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Heptachlor	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Methoxychlor	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	< 0.4	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Acenaphthylene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Acenaphthene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Anthracene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	< 0.03	< 0.04	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Chrysene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Fluoranthene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Fluorene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Naphthalene	mg/kg dry wt	< 0.07	< 0.06	< 0.07	-	-
Perylene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-
Phenanthrene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-	-

Sample Type: Soil					
Sample Name:		SQ_SS40 10-Feb-2022	SQ_SS41 (0.3) 10-Feb-2022	SQ_SS42 10-Feb-2022	SQ_SS43 (0.3) 10-Feb-2022
Lab Number:		2864529.30	2864529.33	2864529.34	2864529.37
Polycyclic Aromatic Hydrocarbons Screening in Soil*					
Pyrene	mg/kg dry wt	< 0.013	< 0.012	< 0.013	-

Analyst's Comments

It has been noted that the spike for OCP on sample 2864529.21, was run as part of our in-house QC procedure, had lower than expected recoveries for Endosulphan sulphate (62%) and Methoxychlor (62%). Therefore the results maybe underestimated.

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, 4-5, 8-10, 13-14, 17-18, 21-22, 25-26, 29-30, 33-34, 37
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1, 5, 8, 13, 21, 29-30, 33-34
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, 4-5, 8-10, 13-14, 17-18, 21-22, 25-26, 29-30, 33-34, 37
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1, 5, 8, 13, 21, 29-30, 33-34
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	1, 5, 8, 13, 21, 29-30, 33-34
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 5, 8, 13, 21, 29-30, 33-34
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	1, 5, 8, 13, 21, 29-30, 33-34
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	1, 5, 8, 13, 21, 29-30, 33-34

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

Testing was completed between 17-Feb-2022 and 23-Feb-2022. 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.

A handwritten signature in blue ink, consisting of a large stylized 'K' followed by the name 'Harrison' in a cursive script.

Kim Harrison MSc
Client Services Manager - Environmental