



Certificate of Analysis

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Client:	Revital Fertilisers	Lab No:	1937589	SPV1
Contact:	D Gibson C/- Revital Fertilisers PO Box 8045 New Plymouth 4342	Date Received:	06-Mar-2018	
		Date Reported:	21-Mar-2018	
		Quote No:		
		Order No:		
		Client Reference:	Radner 2 Drill Cuttings	
		Submitted By:	D Gibson	

Sample Type: Soil						
Sample Name:	Unlabelled Soil Sample					
Lab Number:	1937589.1					
Individual Tests						
Dry Matter	g/100g as rcvd	80	-	-	-	-
Total Recoverable Potassium	mg/kg dry wt	2,500	-	-	-	-
Total Recoverable Sodium	mg/kg dry wt	3,400	-	-	-	-
Chloride*	mg/kg dry wt	9,800	-	-	-	-
pH*	pH Units	10.7	-	-	-	-
Total Nitrogen*	g/100g dry wt	0.07	-	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	16	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	33	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	40	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	59	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	24	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	159	-	-	-	-
BTEX in Soil by Headspace GC-MS						
Benzene	mg/kg dry wt	< 0.05	-	-	-	-
Toluene	mg/kg dry wt	0.18	-	-	-	-
Ethylbenzene	mg/kg dry wt	0.09	-	-	-	-
m&p-Xylene	mg/kg dry wt	0.38	-	-	-	-
o-Xylene	mg/kg dry wt	0.17	-	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	2.6	-	-	-	-
2-Methylnaphthalene	mg/kg dry wt	6.2	-	-	-	-
Perylene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	< 0.3	-	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	< 0.4	-	-	-	-
Acenaphthylene	mg/kg dry wt	0.32	-	-	-	-
Acenaphthene	mg/kg dry wt	3.2	-	-	-	-
Anthracene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.12	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.12	-	-	-	-

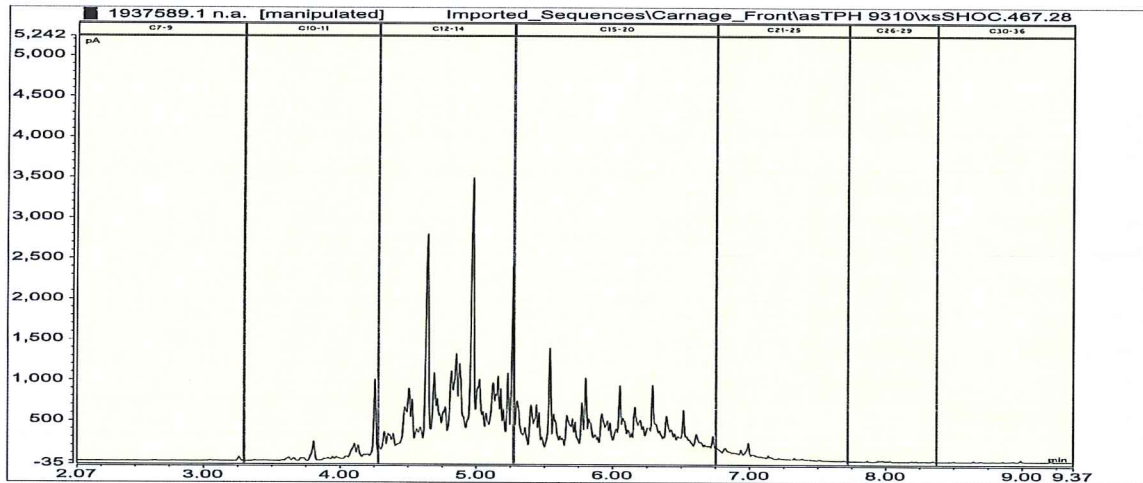


Sample Type: Soil

Sample Name:	Unlabelled Soil Sample				
Lab Number:	1937589.1				

Polycyclic Aromatic Hydrocarbons Screening in Soil						
Chrysene	mg/kg dry wt	< 0.12	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.12	-	-	-	-
Fluoranthene	mg/kg dry wt	< 0.12	-	-	-	-
Fluorene	mg/kg dry wt	0.66	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.12	-	-	-	-
Naphthalene	mg/kg dry wt	3.7	-	-	-	-
Phenanthrene	mg/kg dry wt	1.10	-	-	-	-
Pyrene	mg/kg dry wt	< 0.12	-	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	190	-	-	-	-
C10 - C14	mg/kg dry wt	65,000	-	-	-	-
C15 - C36	mg/kg dry wt	50,000	-	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	116,000	-	-	-	-

1937589.1
 Unlabelled Soil Sample
 Client Chromatogram for TPH by FID



Analyst's Comments

Only plastic containers were supplied for the sample 1937589/1. Please note that glass containers should be used for TPH/PAH/VOC/BTEX analysis to avoid loss of volatile's and possible plastic contamination.

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 clean 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.

Test	Method Description	Default Detection Limit	Sample No
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	1
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:5786,2805,10734;2695]	0.002 - 60 mg/kg dry wt	1
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
BTEX in Soil by Headspace GC-MS	Solvent extraction, Headspace GC-MS analysis US EPA 8260B. Tested on as received sample [KBIs:5782,26687,3629]	0.05 - 0.10 mg/kg dry wt	1
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

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
esiCextn*	(1:5) ratio of sample (g):0.02M potassium dihydrogen ortho-phosphate extractant (mL), analysis by Ion Chromatography. In House.	-	1
Total Recoverable Potassium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	100 mg/kg dry wt	1
Total Recoverable Sodium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	40 mg/kg dry wt	1
Chloride*	Ion Chromatography determination of a potassium phosphate extract of an environmental solid.	3 mg/kg dry wt	1
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH.	0.1 pH Units	1
Total Nitrogen*	Catalytic Combustion (900°C, O ₂), separation, Thermal Conductivity Detector [Elementar Analyser].	0.05 g/100g dry wt	1
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from Benz(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 + Chrysene x 0.01 + Dibenz(a,h)anthracene x 1 + 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
Benzo[a]pyrene Toxic Equivalence (TEF)	BaP Toxic Equivalence calculated from Benzo(a)anthracene x 0.1 + BaP x 1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.1 + 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

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

