

Appendix D

CH2M Beca Hospital Prince of Wales Reservoir, Upper Playing Field, Preliminary Contamination Investigation - 2012



21 Pitt Street
PO Box 6345, Auckland 1141, New Zealand
T: +64 9 300 9000 // F: +64 9 300 9300
E: info@beca.com // www.ch2mbea.co.nz

Capacity Infrastructure Services
Private Bag 39804
Lower Hutt 5045
New Zealand

31 October 2012

Attention: Keith Woolley

Dear Keith

Hospital Prince of Wales Reservoir, Upper Playing Field, Preliminary Contamination Investigation

CH2M Beca Ltd (Beca) has been commissioned by Wellington City Council (WCC) to provide a preliminary soil contamination assessment of the upper playing field at the Prince of Wales Park, Mt Cook, Wellington.

We understand that the park area may previously have been the site of a clay brick manufacturing facility. Brickworks usually require kilns to fire the bricks, which produce ash and clinker requiring disposal - often on site. Ash and clinker can contain heavy metals and products of combustion such as polycyclic aromatic hydrocarbons (PAH). The use of the area in recent times as a sports turf also indicates the possibility of pesticides and herbicide use for the maintenance of the turf area.

At the client's request, soil samples were collected during the preliminary geotechnical works on the periphery pitch area of the upper playing field and analysed for contaminants to give an initial indication of their likely presence.

Brief details of the sampling are included in this interim report, along with the results of the chemical laboratory analysis of the samples. It should be noted that this report does not constitute a full contamination assessment, rather a preliminary indication of whether contaminants are present.

1 Site Assessment Methodology

1.1 Approach to Ground Investigation

A geotechnical site investigation was undertaken between 11 and 21 September 2012 by J.Wall Ltd, with the borehole drilling subcontracted to Griffiths Drilling (NZ) Ltd, under the supervision of Beca.

The site investigations comprised the following:

- Two machine boreholes (BH01 and BH02) to depths of 8.45m and 10m respectively;
- Seven machine excavated test pits (ST02, ST05 and TP01 to TP05) to depths ranging from 0.36m to 3.7m;
- Four hand augers for geotechnical purposes (HA01, HA02, HA03B and HA04) to depths ranging from 0.9m to 3.45m to verify ground conditions.
- Four hand augers samples (HAS 1 (NW), HAS 2 (SE), HAS 3 (NE), HAS 4 (SW)) from the top 150mm to provide soil samples for contamination testing.

A map of the sampling locations for this report is included as **Attachment 1**.

For further details including sampling locations please refer to the report *Hospital Prince of Wales Reservoir Geotechnical Report – Addendum*, Beca, October 2012.

It should be noted that as agreed with the client this contamination investigation is not in accordance with Ministry for the Environment guidelines, and should be viewed as a preliminary contamination investigation only.

1.2 Site Investigation Activities

Soil samples for the purposes of contamination testing were collected from locations BH01, BH02 and HAS 1 (NW), HAS 2 (SE), HAS 3 (NE) and HAS 4 (SW). A map of the sampling locations is included as **Attachment 1**.

One surface (0m – 0.15m below ground level (bgl)) sample was collected at each location. Additional deeper samples were collected from locations BH01 and BH02 at approximate 1m intervals, as dictated by encountered lithology.

A total of 11 samples were collected. Sample details are provided in **Table 1**.

1.3 Laboratory testing

All chemical laboratory analyses were performed by R J Hill Laboratories Ltd (Hill Laboratories) who are IANZ accredited. The analysis suite is provided in **Table 1**. All samples submitted to Hill Laboratories for testing were accompanied by Chain of Custody forms which detailed the required handling and testing instructions. Copies of the Chain of Custody forms are available on request. The Hill Laboratories report is included as **Attachment 3**.

Table 1 – Summary of Soil Sampling and Analysis

| Location | Investigation hole depth (m bgl) | Laboratory Number | Sample Depth (m) | Soil Type | Analysis Suite |
|------------|----------------------------------|-------------------|------------------|-----------|------------------|
| HAS 1 (NW) | 0.15 | 1051240.1 | 0 – 0.15 | Silt | HM, OCP/ONP, PAH |
| HAS 2 (SE) | 0.15 | 1051240.2 | 0 – 0.15 | Silt | HM, OCP/ONP, PAH |
| HAS 3 (NE) | 0.15 | 1051240.3 | 0 – 0.15 | Silt | HM, OCP/ONP, PAH |
| HAS 4 (SW) | 0.15 | 1051240.4 | 0 – 0.15 | Silt | HM, OCP/ONP, PAH |
| BH01 | 8.45 | 1051240.5 | 0 – 0.15 | Silt | HM, PAH |
| | | 1051240.6 | 0.9 – 1.2 | Silt | HM, PAH |
| | | 1051240.7 | 1.9 – 2.2 | Silt | HM, PAH |
| | | 1051240.8 | 2.9 – 3.1 | Silt | HM, PAH |
| BH02 | 10.0 | 1051240.9 | 0 – 0.15 | Silt | HM, PAH |
| | | 1051241.10 | 0.9 – 1.2 | Silt | HM, PAH |
| | | 1051241.11 | 1.9 – 2.1 | Silt | HM, PAH |

HM = Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc).

OCP/ONP = Organochlorine and Organonitro&phosphate Pesticides

PAH = Polycyclic Aromatic Hydrocarbons

The analysis suite for each sample was selected based on the history of the site, the potentially contaminating activities that may have occurred, and the likely contaminants associated with those activities.

2 Investigation Results

The results of the investigation showed the presence of low levels of organochlorine pesticide, DDT, and heavy metals (cadmium, lead and nickel) in shallow surface samples collected from the hand auger locations within the sports turf area. Low levels of PAH were also detected in these samples, as well as the shallow surface samples from the borehole locations.

Results of the sampling were compared against 'commercial/industrial outdoor worker' and 'recreational' assessment criteria selected from the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES (Soil)).

A Regional Resource Consent assessment has not been undertaken at this stage.

There were no results which exceeded the NES (Soil) criteria, although there were some elevated levels of heavy metals (cadmium, lead and nickel) and PAH above background levels. The assessment criteria at this stage indicate whether or not there is a potential human health risk to construction workers or current site users (i.e. above recreational or commercial/industrial assessment criteria).

A summary of the analytical results and adopted assessment criteria is presented in the Laboratory Results Summary Sheet in **Attachment 2**.

3 Discussion

The results of the investigation show that there has been historical application of DDT to the sports playing field (noting three sampling positions are located on the periphery of the field). There is also the presence of low levels of PAH in shallow soil samples, and some elevated levels of heavy metals above background levels. Certain elements or compounds of anthropogenic origin are widespread in the environment and accumulate in soils and are also present at what are effectively background levels. Such compounds include trace metals and hydrocarbons, including PAH.

3.1 Regulatory Requirements

The use of persistent pesticides on a sports turf is an activity listed on the Hazardous Activities and Industries List (HAIL). The NES (Soil) Regulations apply to a piece of land where a HAIL activity has occurred. The NES (Soil) Regulations provide a set of nationally consistent set of planning controls for certain activities occurring on HAIL land, including soil disturbance, underground tank removal, soil sampling, subdivision and land use change.

As the development activities at the sports turf involve soil disturbance by removing the top soil, then the activity must comply with the NES (Soil) Regulations.

For the soil disturbance to be a Permitted Activity under Regulation 8(3) of the NES (Soil), then no more than 25m³ per 500m² of soil can be disturbed and no more than 5m³ can be disposed of off site. The sports turf is approximately 7700m² and is assumed to have had pesticides applied across the entire area. Therefore 385m³ can be disturbed and 77m³ can be disposed. The disturbance and disposal volumes required for the project are significantly higher than this, and so the activity cannot comply with the Permitted Activity conditions.

A resource consent will be required to undertake the soil disturbance under either Regulation 9, 10 or 11 of the NES (Soil). Where a Detailed Site Investigation (DSI) report exists which states that the soil contamination does not exceed the standards in Regulation 7, then the activity can proceed as a Controlled Activity. Where a Detailed Site Investigation (DSI) report exists which states that the soil contamination does exceed the standards in Regulation 7, then the activity proceeds as a Restricted Discretionary Activity. Where no DSI exists, the activity proceeds as a Discretionary Activity.

The Regulations apply regardless of the level of contamination and control certain types of activities on contaminated land including soil disturbance.

4 Recommendations

Should WCC wish to undertake a DSI then we would recommend the following:

- Undertake an intrusive investigation in accordance with MfE Guidelines. This would involve the collection of additional samples from the surface of the sports turf to confirm the anticipated uniform presence of DDT. Further investigation may be required where there are known areas of ash/clinker deposits from the old brickworks. Consideration should be given as to whether a potentially contaminating activity has occurred within the area being excavated for the reservoir.
- Reporting of the DSI to MfE Guidelines, and preparation of a management and/or remediation plan for the disturbance of soils on site.
- Submission of DSI report and management plan alongside an application for land use consent under Regulation 9 or 10 of the NES (Soil) (depending on the risk posed by the contaminants identified through the investigation).

Alternatively, WCC may wish to default to an application for a Discretionary Activity consent under Regulation 11 of the NES (Soil), rather than undertaking a DSI. The implications of this are that the consenting team in WCC would have full discretion over how the works are managed, and may require an investigation to be undertaken.

We would be pleased to discuss the options available with WCC and provide a cost estimate for carrying out a DSI.

Yours faithfully

Genevieve Smith
Senior Environmental Scientist

on behalf of

CH2M Beca Ltd

Direct Dial: +64 9 308 4576

Email: genevieve.smith@beca.com

Attachment 1 – Map of Sample Locations

Attachment 2 – CH2M Beca Laboratory Results Summary Sheet

Attachment 3 – Hill Laboratories Report

Attachment 1
Geotechnical Site Plan
(Showing Sampling Locations)



Survey Legend

| FEATURE | DESCRIPTION |
|---------|---------------------|
| --- | Bottom of Bank |
| --- | Top of Bank |
| --- | Building |
| --- | Edge of Concrete |
| --- | Centreline of Ditch |
| --- | Breakline |
| --- | Fence |
| --- | Gate |
| --- | Edge of Track |
| --- | Edge of Seal |
| --- | Road Centreline |
| --- | Post |
| --- | Manhole |
| --- | Power Pole |
| --- | Fire Hydrant |
| --- | Sign |
| --- | Spot Height |
| --- | Water Meter |
| --- | Sluice Valve |
| -70.0- | Major Contour 5m |
| -70.0- | Minor Contour 1m |

Notes:
Height Datum: New City Datum
Origin of Heights: Wellington PrimaryTGRM
11.58m Wellington VD 1953
(New City Datum = Wellington V.D. 1953)

Coordinate Datum: NZTM2000
Origin of Coordinates: Wellington Airport
(WGTN) LINZ continuous tracking station

Pot holing survey programmed for September

Geotechnical Legend

| | |
|-----|--|
| --- | APPROXIMATE LOCATION OF PROPOSED RESERVOIR |
| --- | ALIGNMENT OF SLOPE STABILITY SECTION |
| --- | BOREHOLE (OPUS, 2011) |
| --- | TEST PIT (OPUS, 2011) |
| --- | BOREHOLE (BECA, 2012) |
| --- | TEST PIT (BECA, 2012) |
| --- | CONTAMINATION SAMPLES (BECA, 2012) |

| | |
|-----------------|---------|
| DEFECTS: | |
| --- | BEDDING |
| --- | JOINT |
| --- | SHEARED |

FOR INFORMATION
NOT FOR CONSTRUCTION

| | | | | | |
|-----|---------------------------------|-----|-----|------|----------|
| C | ADDENDUM REPORT | WZC | SS | SAE | 31.10.12 |
| B | PEER REVIEW COMMENTS | WZC | JS | SAE | 03.10.12 |
| A | FOR INITIAL GEOTECHNICAL REPORT | HLV | SRW | SAE | 27.07.12 |
| No. | Revision | By | Chk | Appd | Date |

Drawing Originator:

| | | |
|-------------------------|--|---------------------|
| Original Scale (A1) 500 | Design JDB | Approved For Issue* |
| Reduced Scale (A3) 1000 | Drawn HLY | 26.07.12 |
| | Checked JDB | 26.06.12 |
| | Dwg Check SAE | 27.06.12 |
| | * Refer to Revision 1 for Original Signature | |

Client:

Project: HOSPITAL PRINCE OF WALES RESERVOIR

Title: GEOTECHNICAL SITE PLAN APPENDIX A

| | |
|-------------|----------------|
| Discipline | GEOTECHNICAL |
| Drawing No. | 6517439-CE-250 |
| Rev. | C |

Attachment 2

CH2M Beca Laboratory Results Summary Sheet

| CH2M BECA SOIL ANALYSIS RESULTS - WCC PRINCE OF WALES PARK | | | | | | | | | | | | Assessment Criteria | | | |
|--|-----------------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|------------|--------------------------------|---------------------------|---|---|
| Sample Date | 20-Sep-12 | 21-Sep-12 | 21-Sep-12 | 21-Sep-12 | 21-Sep-12 | 21-Sep-12 | 21-Sep-12 | 21-Sep-12 | 20-Sep-12 | 20-Sep-12 | 20-Sep-12 | | | | |
| Hand Auger/BH Number | HAS 01 (NW) | HAS 02 (SE) | HAS 3 (NE) | HAS 4 (SW) | BH01 (NW) | BH01 (NW) | BH01 (NW) | BH01 (NW) | BH02 | BH02 | BH02 | Background levels ^a | Recreational ^b | Commercial / industrial outdoor worker (unpaved) ^b | |
| Sample Number | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | 12:123 | | | | |
| Laboratory Number | 1051240.1 | 1051240.2 | 1051240.3 | 1051240.4 | 1051240.5 | 1051240.6 | 1051240.7 | 1051240.8 | 1051240.9 | 1051241.1 | 1051241.11 | | | | |
| Sample Depth (m) | 0 - 0.15 | 0 - 0.15 | 0 - 0.15 | 0 - 0.15 | 0 - 0.15 | 0.9 - 1.2 | 1.9 - 2.2 | 2.9 - 3.1 | 0 - 0.15 | 0.9 - 1.2 | 1.9 - 2.1 | | | | |
| Soil Type | Silt | Silt | Silt | Silt | Silt | Silt | Silt | Silt | Silt | Silt | Silt | | | | |
| Heavy metals (mg/kg) | | | | | | | | | | | | | | | |
| Arsenic | 7 | 3 | 5 | 5 | 5 | 2 | 2 | 4 | 3 | 3 | 3 | <2-7 | 80 | 70 | |
| Cadmium | 0.29 | 0.11 | 0.15 | 0.14 | 0.17 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | <0.1-0.1 | 400 | 1,300 | |
| Chromium | 12 | 12 | 14 | 13 | 13 | 19 | 17 | 15 | 12 | 19 | 18 | 6-16 | 2,700 | 6,300 | |
| Copper | 11 | 9 | 19 | 11 | 16 | 16 | 12 | 14 | 9 | 16 | 16 | 3-25 | >10,000 | >10,000 | |
| Lead | 57 | 49 | 100 | 123 | 80 | 24 | 25 | 40 | 47 | 22 | 21 | 5.9-78.6 | 880 | 3,300 | |
| Nickel | 7 | 6 | 7 | 8 | 8 | 14 | 11 | 10 | 7 | 13 | 15 | 4-13 | 130 ^c | 1,800 ^c | |
| Zinc | 73 | 50 | 88 | 61 | 83 | 85 | 60 | 87 | 54 | 65 | 76 | 24-105 | 23,000 ^d | 31,000 ^d | |
| Organochlorine Pesticides (mg/kg) | | | | | | | | | | | | | | | |
| 2,4'-DDD | < 0.010 | < 0.010 | < 0.010 | < 0.010 | Not tested | | | | | | | - | - | - | |
| 4,4'-DDD | 0.017 | 0.035 | 0.023 | 0.032 | Not tested | | | | | | | - | - | - | |
| 2,4'-DDE | < 0.010 | < 0.010 | < 0.010 | < 0.010 | Not tested | | | | | | | - | - | - | |
| 4,4'-DDE | 0.081 | 0.079 | 0.28 | 0.189 | Not tested | | | | | | | - | - | - | |
| 2,4'-DDT | 0.029 | < 0.010 | 0.014 | 0.073 | Not tested | | | | | | | - | - | - | |
| 4,4'-DDT | 0.162 | 0.44 | 0.24 | 0.38 | Not tested | | | | | | | - | - | - | |
| Total DDT | 0.309 | 0.584 | 0.577 | 0.694 | Not tested | | | | | | | - | 400 | 1,000 | |
| All Other Compounds | Below Detection | | | | Not tested | | | | | | | - | - | - | |
| Organonitro&phosphorus Pesticides (mg/kg) | | | | | | | | | | | | | | | |
| All Compounds | Below Detection | | | | - | - | - | - | - | - | - | - | - | - | - |
| Polycyclic Aromatic Hydrocarbons (mg/kg) | | | | | | | | | | | | | | | |
| Acenaphthene | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | - | - | - | |
| Acenaphthylene | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | - | - | - | |
| Anthracene | < 0.03 | < 0.04 | 0.09 | < 0.04 | < 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | <0.002-0.05 | - | - | |
| Benzo[a]anthracene | 0.05 | 0.04 | 0.23 | 0.04 | 0.08 | < 0.04 | < 0.03 | < 0.04 | 0.07 | < 0.03 | < 0.03 | - | - | - | |
| Benzo[a]pyrene (BAP) | 0.06 | 0.05 | 0.24 | 0.05 | 0.08 | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 | < 0.03 | <0.02-0.27 | - | - | |
| Benzo[b]fluoranthene | 0.07 | 0.06 | 0.3 | 0.06 | 0.11 | < 0.04 | < 0.03 | < 0.04 | 0.11 | < 0.03 | < 0.03 | - | - | - | |
| Benzo[g,h,i]perylene | 0.06 | 0.06 | 0.23 | 0.06 | 0.1 | < 0.04 | < 0.03 | < 0.04 | 0.1 | < 0.03 | < 0.03 | - | - | - | |
| Benzo[k]fluoranthene | 0.04 | < 0.04 | 0.14 | < 0.04 | 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | - | - | - | |
| Chrysene | 0.07 | 0.05 | 0.26 | 0.05 | 0.09 | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 | < 0.03 | - | - | - | |
| Dibenzo[a,h]anthracene | < 0.03 | < 0.04 | 0.04 | < 0.04 | < 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | - | - | - | |
| Fluoranthene | 0.15 | 0.1 | 0.66 | 0.09 | 0.19 | < 0.04 | < 0.03 | < 0.04 | 0.19 | < 0.03 | < 0.03 | <0.002-0.55 | - | - | |
| Fluorene | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 | < 0.03 | - | - | - | |
| Indeno(1,2,3-c,d)pyrene | 0.06 | 0.05 | 0.21 | 0.05 | 0.08 | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 | < 0.03 | - | - | - | |
| Naphthalene | < 0.15 | < 0.16 | < 0.17 | < 0.16 | < 0.3 | < 0.16 | < 0.15 | < 0.16 | < 0.3 | < 0.14 | < 0.14 | <0.002-0.01 | - | - | |
| Phenanthrene | 0.12 | 0.06 | 0.49 | 0.05 | 0.1 | < 0.04 | < 0.03 | < 0.04 | 0.11 | < 0.03 | < 0.03 | <0.002-0.26 | - | - | |
| Pyrene | 0.16 | 0.12 | 0.68 | 0.11 | 0.22 | < 0.04 | < 0.03 | 0.04 | 0.22 | < 0.03 | < 0.03 | <0.002-0.57 | - | - | |
| BaP equivalent | 0.099 | 0.089 | 0.377 | 0.088 | 0.140 | <0.1 | <0.07 | <0.1 | 0.153 | <0.07 | <0.07 | - | 40 | 35 | |

^a Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 2 (Greywacke)' have been used.

^b Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES)

^c Environment Agency (EA). Soil Guideline Values for nickel in soil. Science report SC050021 / Nickel SGV (2009). 'Commercial' land use values used for outdoor worker exposure, 'Residential' land use values conservatively used for recreational user exposure

^d United States Environmental Protection Agency (USEPA). Regional Screening Level Summary Table April 2012. 'Industrial' soil values used for outdoor worker exposure, 'Residential' values used as conservative assessment for recreational user exposure

Grey shading indicates values above background levels.

Bold indicates values above NES criteria

- indicates no guideline value



Attachment 3

Hill Laboratories Report



ANALYSIS REPORT

Page 1 of 5

| | | | | |
|-----------------|---------------------------------|--------------------------|--------------|------|
| Client: | Beca Infrastructure Limited | Lab No: | 1051240 | SPV1 |
| Contact: | Kate Jackson | Date Registered: | 25-Sep-2012 | |
| | C/- Beca Infrastructure Limited | Date Reported: | 09-Oct-2012 | |
| | PO Box 6345 | Quote No: | | |
| | Wellesley Street | Order No: | | |
| | AUCKLAND 1141 | Client Reference: | 12:123 | |
| | | Submitted By: | Kate Jackson | |

| Sample Type: Soil | | | | | | |
|---|--|--|--|--|--|------|
| Sample Name: | 12:123 HAS 1 (NW) 20-Sep-2012 10:30 am | 12:123 HAS 2 (SE) 21-Sep-2012 10:00 am | 12:123 HAS 3 (NE) 21-Sep-2012 10:15 am | 12:123 HAS 4 (SW) 21-Sep-2012 12:00 pm | 12:123 BH01 (NW) 0-15cm 21-Sep-2012 12:45 pm | |
| Lab Number: | 1051240.1 | 1051240.2 | 1051240.3 | 1051240.4 | 1051240.5 | |
| Individual Tests | | | | | | |
| Dry Matter | g/100g as rcvd | 79 | 75 | 75 | 79 | 58 |
| Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn | | | | | | |
| Total Recoverable Arsenic | mg/kg dry wt | 7 | 3 | 5 | 5 | 5 |
| Total Recoverable Cadmium | mg/kg dry wt | 0.29 | 0.11 | 0.15 | 0.14 | 0.17 |
| Total Recoverable Chromium | mg/kg dry wt | 12 | 12 | 14 | 13 | 13 |
| Total Recoverable Copper | mg/kg dry wt | 11 | 9 | 19 | 11 | 16 |
| Total Recoverable Lead | mg/kg dry wt | 57 | 49 | 100 | 123 | 80 |
| Total Recoverable Nickel | mg/kg dry wt | 7 | 6 | 7 | 8 | 8 |
| Total Recoverable Zinc | mg/kg dry wt | 73 | 50 | 88 | 61 | 83 |
| Organochlorine Pesticides Screening in Soil | | | | | | |
| Aldrin | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| alpha-BHC | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| beta-BHC | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| delta-BHC | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| gamma-BHC (Lindane) | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| cis-Chlordane | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| trans-Chlordane | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Total Chlordane [(cis+trans)* 100/42] | mg/kg dry wt | < 0.04 | < 0.04 | < 0.04 | < 0.04 | - |
| 2,4'-DDD | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| 4,4'-DDD | mg/kg dry wt | 0.017 | 0.035 | 0.023 | 0.032 | - |
| 2,4'-DDE | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| 4,4'-DDE | mg/kg dry wt | 0.081 | 0.079 | 0.28 | 0.189 | - |
| 2,4'-DDT | mg/kg dry wt | 0.029 | < 0.010 | 0.014 | 0.073 | - |
| 4,4'-DDT | mg/kg dry wt | 0.162 | 0.44 | 0.24 | 0.38 | - |
| Dieldrin | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endosulfan I | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endosulfan II | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endosulfan sulphate | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endrin | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endrin Aldehyde | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Endrin ketone | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Heptachlor | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Heptachlor epoxide | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Hexachlorobenzene | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |
| Methoxychlor | mg/kg dry wt | < 0.010 | < 0.010 | < 0.010 | < 0.010 | - |



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

| Sample Type: Soil | | | | | | |
|--|--------------|---|--|--|---|---|
| Sample Name: | | 12:123 HAS 1 (NW) 20-Sep-2012 10:30 am | 12:123 HAS 2 (SE) 21-Sep-2012 10:00 am | 12:123 HAS 3 (NE) 21-Sep-2012 10:15 am | 12:123 HAS 4 (SW) 21-Sep-2012 12:00 pm | 12:123 BH01 (NW) 0-15cm 21-Sep-2012 12:45 pm |
| Lab Number: | | 1051240.1 | 1051240.2 | 1051240.3 | 1051240.4 | 1051240.5 |
| Organonitro&phosphorus Pesticides Screen in Soil by GCMS | | | | | | |
| Acetochlor | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Alachlor | mg/kg | < 0.05 | < 0.05 | < 0.05 | < 0.05 | - |
| Atrazine | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Atrazine-desethyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Atrazine-desisopropyl | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Azaconazole | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Azinphos-methyl | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Benalaxyl | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Bitertanol | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Bromacil | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Bromopropylate | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Butachlor | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Captan | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Carbaryl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Carbofuran | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Chlorfluazuron | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Chlorothalonil | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Chlorpyrifos | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Chlorpyrifos-methyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Chlortoluron | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Cyanazine | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Cyfluthrin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Cyhalothrin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Cypermethrin | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Deltamethrin (Tralomethrin) | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Diazinon | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Dichlofuanid | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Dichloran | mg/kg | < 0.2 | < 0.2 | < 0.2 | < 0.2 | - |
| Dichlorvos | mg/kg | < 0.09 | < 0.09 | < 0.09 | < 0.09 | - |
| Difenoconazole | mg/kg | < 0.09 | < 0.09 | < 0.09 | < 0.09 | - |
| Dimethoate | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Diphenylamine | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Diuron | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Fenpropimorph | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Fluazifop-butyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Fluometuron | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Flusilazole | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Fluvalinate | mg/kg | < 0.05 | < 0.05 | < 0.05 | < 0.05 | - |
| Furalaxyl | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Haloxifop-methyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Hexaconazole | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Hexazinone | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| IPBC (3-Iodo-2-propynyl-n-butylcarbamate) | mg/kg dry wt | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| Iprodione | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Kresoxim-methyl | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Linuron | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Malathion | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Metalaxyl (Mefenoxam) | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Methamidophos | mg/kg | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| Metolachlor | mg/kg | < 0.05 | < 0.05 | < 0.05 | < 0.05 | - |
| Metribuzin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Molinate | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Myclobutanil | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |

| Sample Type: Soil | | | | | | |
|--|--------------|---|--|--|---|---|
| Sample Name: | | 12:123 HAS 1 (NW) 20-Sep-2012 10:30 am | 12:123 HAS 2 (SE) 21-Sep-2012 10:00 am | 12:123 HAS 3 (NE) 21-Sep-2012 10:15 am | 12:123 HAS 4 (SW) 21-Sep-2012 12:00 pm | 12:123 BH01 (NW) 0-15cm 21-Sep-2012 12:45 pm |
| Lab Number: | | 1051240.1 | 1051240.2 | 1051240.3 | 1051240.4 | 1051240.5 |
| Organonitro&phosphorus Pesticides Screen in Soil by GCMS | | | | | | |
| Naled | mg/kg | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| Norflurazon | mg/kg | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Oxadiazon | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Oxyfluorfen | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Paclobutrazol | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Parathion-ethyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Parathion-methyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Pendimethalin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Permethrin | mg/kg | < 0.02 | < 0.02 | < 0.02 | < 0.02 | - |
| Pirimicarb | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Pirimiphos-methyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Prochloraz | mg/kg | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| Procymidone | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Prometryn | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Propachlor | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Propanil | mg/kg | < 0.2 | < 0.2 | < 0.2 | < 0.2 | - |
| Propazine | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Propiconazole | mg/kg | < 0.05 | < 0.05 | < 0.05 | < 0.05 | - |
| Pyriproxyfen | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Quizalofop-ethyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Simazine | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Simetryn | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Sulfentrazone | mg/kg | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan] | mg/kg dry wt | < 0.12 | < 0.13 | < 0.13 | < 0.12 | - |
| Tebuconazole | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Terbacil | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Terbufos | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Terbumeton | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Terbutylazine | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Terbutylazine-desethyl | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Terbutryn | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Thiabendazole | mg/kg | < 0.3 | < 0.4 | < 0.4 | < 0.3 | - |
| Thiobencarb | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Tolylfluanid | mg/kg | < 0.03 | < 0.04 | < 0.04 | < 0.03 | - |
| Triazophos | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Trifluralin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Vinclozolin | mg/kg | < 0.06 | < 0.07 | < 0.07 | < 0.06 | - |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | | | | | | |
| Acenaphthene | mg/kg dry wt | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 |
| Acenaphthylene | mg/kg dry wt | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 |
| Anthracene | mg/kg dry wt | < 0.03 | < 0.04 | 0.09 | < 0.04 | < 0.05 |
| Benzo[a]anthracene | mg/kg dry wt | 0.05 | 0.04 | 0.23 | 0.04 | 0.08 |
| Benzo[a]pyrene (BAP) | mg/kg dry wt | 0.06 | 0.05 | 0.24 | 0.05 | 0.08 |
| Benzo[b]fluoranthene + Benzo[j] fluoranthene | mg/kg dry wt | 0.07 | 0.06 | 0.30 | 0.06 | 0.11 |
| Benzo[g,h,i]perylene | mg/kg dry wt | 0.06 | 0.06 | 0.23 | 0.06 | 0.10 |
| Benzo[k]fluoranthene | mg/kg dry wt | 0.04 | < 0.04 | 0.14 | < 0.04 | 0.05 |
| Chrysene | mg/kg dry wt | 0.07 | 0.05 | 0.26 | 0.05 | 0.09 |
| Dibenzo[a,h]anthracene | mg/kg dry wt | < 0.03 | < 0.04 | 0.04 | < 0.04 | < 0.05 |
| Fluoranthene | mg/kg dry wt | 0.15 | 0.10 | 0.66 | 0.09 | 0.19 |
| Fluorene | mg/kg dry wt | < 0.03 | < 0.04 | < 0.04 | < 0.04 | < 0.05 |
| Indeno(1,2,3-c,d)pyrene | mg/kg dry wt | 0.06 | 0.05 | 0.21 | 0.05 | 0.08 |
| Naphthalene | mg/kg dry wt | < 0.15 | < 0.16 | < 0.17 | < 0.16 | < 0.3 |

| Sample Type: Soil | | | | | | |
|--|--|--|---|--|--|--------|
| Sample Name: | 12:123 HAS 1 (NW) 20-Sep-2012 10:30 am | 12:123 HAS 2 (SE) 21-Sep-2012 10:00 am | 12:123 HAS 3 (NE) 21-Sep-2012 10:15 am | 12:123 HAS 4 (SW) 21-Sep-2012 12:00 pm | 12:123 BH01 (NW) 0-15cm 21-Sep-2012 12:45 pm | |
| Lab Number: | 1051240.1 | 1051240.2 | 1051240.3 | 1051240.4 | 1051240.5 | |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | | | | | | |
| Phenanthrene | mg/kg dry wt | 0.12 | 0.06 | 0.49 | 0.05 | 0.10 |
| Pyrene | mg/kg dry wt | 0.16 | 0.12 | 0.68 | 0.11 | 0.22 |
| Sample Name: | 12:123 BH01 (NW) 0.9-1.2m 21-Sep-2012 12:50 pm | 12:123 BH01 (NW) 1.9-2.2m 21-Sep-2012 12:55 pm | 12:123 BH01 (NW) 2.9-3.1m 21-Sep-2012 1:00 pm | 12:123 BH02 0-15cm 20-Sep-2012 1:15 pm | 12:123 BH02 0.9-1.3m 20-Sep-2012 1:20 pm | |
| Lab Number: | 1051240.6 | 1051240.7 | 1051240.8 | 1051240.9 | 1051240.10 | |
| Individual Tests | | | | | | |
| Dry Matter | g/100g as rcvd | 80 | 79 | 79 | 41 | 81 |
| Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn | | | | | | |
| Total Recoverable Arsenic | mg/kg dry wt | 2 | 2 | 4 | 3 | 3 |
| Total Recoverable Cadmium | mg/kg dry wt | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Recoverable Chromium | mg/kg dry wt | 19 | 17 | 15 | 12 | 19 |
| Total Recoverable Copper | mg/kg dry wt | 16 | 12 | 14 | 9 | 16 |
| Total Recoverable Lead | mg/kg dry wt | 24 | 25 | 40 | 47 | 22 |
| Total Recoverable Nickel | mg/kg dry wt | 14 | 11 | 10 | 7 | 13 |
| Total Recoverable Zinc | mg/kg dry wt | 85 | 60 | 87 | 54 | 65 |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | | | | | | |
| Acenaphthene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Acenaphthylene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Anthracene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Benzo[a]anthracene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.07 | < 0.03 |
| Benzo[a]pyrene (BAP) | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 |
| Benzo[b]fluoranthene + Benzo[j]fluoranthene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.11 | < 0.03 |
| Benzo[g,h,i]perylene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.10 | < 0.03 |
| Benzo[k]fluoranthene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Chrysene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 |
| Dibenzo[a,h]anthracene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Fluoranthene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.19 | < 0.03 |
| Fluorene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | < 0.06 | < 0.03 |
| Indeno(1,2,3-c,d)pyrene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.09 | < 0.03 |
| Naphthalene | mg/kg dry wt | < 0.16 | < 0.15 | < 0.16 | < 0.3 | < 0.14 |
| Phenanthrene | mg/kg dry wt | < 0.04 | < 0.03 | < 0.04 | 0.11 | < 0.03 |
| Pyrene | mg/kg dry wt | < 0.04 | < 0.03 | 0.04 | 0.22 | < 0.03 |
| Sample Name: | 12:123 BH02 1.9-2.1m 20-Sep-2012 1:25 pm | | | | | |
| Lab Number: | 1051240.11 | | | | | |
| Individual Tests | | | | | | |
| Dry Matter | g/100g as rcvd | 83 | - | - | - | - |
| Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn | | | | | | |
| Total Recoverable Arsenic | mg/kg dry wt | 3 | - | - | - | - |
| Total Recoverable Cadmium | mg/kg dry wt | < 0.10 | - | - | - | - |
| Total Recoverable Chromium | mg/kg dry wt | 18 | - | - | - | - |
| Total Recoverable Copper | mg/kg dry wt | 16 | - | - | - | - |
| Total Recoverable Lead | mg/kg dry wt | 21 | - | - | - | - |
| Total Recoverable Nickel | mg/kg dry wt | 15 | - | - | - | - |
| Total Recoverable Zinc | mg/kg dry wt | 76 | - | - | - | - |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | | | | | | |
| Acenaphthene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Acenaphthylene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Anthracene | mg/kg dry wt | < 0.03 | - | - | - | - |

| Sample Type: Soil | | | | | | |
|--|--------------|--|---|---|---|---|
| Sample Name: | | 12:123 BH02 1.9-2.1m 20-Sep-2012 1:25 pm | | | | |
| Lab Number: | | 1051240.11 | | | | |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | | | | | | |
| Benzo[a]anthracene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Benzo[a]pyrene (BAP) | mg/kg dry wt | < 0.03 | - | - | - | - |
| Benzo[b]fluoranthene + Benzo[j]fluoranthene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Benzo[g,h,i]perylene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Benzo[k]fluoranthene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Chrysene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Dibenzo[a,h]anthracene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Fluoranthene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Fluorene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Indeno(1,2,3-c,d)pyrene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Naphthalene | mg/kg dry wt | < 0.14 | - | - | - | - |
| Phenanthrene | mg/kg dry wt | < 0.03 | - | - | - | - |
| Pyrene | mg/kg dry wt | < 0.03 | - | - | - | - |

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.

| Sample Type: Soil | | | |
|---|--|-------------------------|---------|
| Test | Method Description | Default Detection Limit | Samples |
| 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%. | - | 1-11 |
| Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn | Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level. | - | 1-11 |
| Organochlorine/nitro&phosphorus Pest.s Screen in Soils, GCMS | Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample | - | 1-4 |
| Polycyclic Aromatic Hydrocarbons Screening in Soil | Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. | - | 1-11 |
| Dry Matter (Env) | Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis). | 0.10 g/100g as rcvd | 1-11 |
| Total Recoverable digestion | Nitric / hydrochloric acid digestion. US EPA 200.2. | - | 1-11 |

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 report must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental Division