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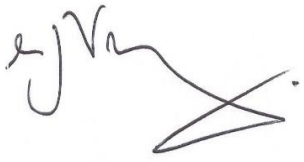
**THE ENVIRONMENTAL LABORATORY LTD**

| | |
|---|---|
| **Analytical Report Number:** | 19-25184 |
| **Issue:** | 1 |
| **Date of Issue:** | 15/10/2019 |
| **Contact:** | Derek Daniels |
| **Customer Details:** | TerraConsult Ltd<br>Bold Business Centre<br>Unit 34, Bold Lane<br>St Helens<br>MersevsideWA9 4TX |
| **Quotation No:** | Q18-01061 |
| **Order No:** | PO-005909 |
| **Customer Reference:** | 4738 |
| **Date Received:** | 08/10/2019 |
| **Date Approved:** | 15/10/2019 |
| **Details:** | English Martyrs |
| **Approved by:** |  |

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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## Sample Summary

**Report No.: 19-25184, issue number 1**

| Elab No. | Client's Ref. | Date Sampled | Date Scheduled | Description | Deviations |
|---|---|---|---|---|---|
| 186140 | TP1 0.20 | 04/10/2019 | 08/10/2019 | Sandy silty loam | |
| 186141 | TP2 0.25 | 04/10/2019 | 08/10/2019 | | |
| 186142 | HP1 0.10 | 04/10/2019 | 08/10/2019 | Sandy silty loam | |

# Results Summary

**Report No.: 19-25184, issue number 1**

| | | | | | |
|---|---|---|---|---|---|
| | | | ELAB Reference | 186140 | 186142 |
| | | | Customer Reference | | |
| | | | Sample ID | | |
| | | | Sample Type | SOIL | SOIL |
| | | | Sample Location | TP1 | HP1 |
| | | | Sample Depth (m) | 0.20 | 0.10 |
| | | | Sampling Date | 04/10/2019 | 04/10/2019 |
| **Determinand** | **Codes** | **Units** | **LOD** | | |
| **Soil sample preparation parameters** | | | | | |
| Moisture Content | N | % | 0.1 | 28.8 | 25.4 |
| Stones Content | N | % | 0.1 | 44.4 | 43.3 |
| Material removed | N | % | 0.1 | 44.4 | 43.3 |
| Description of Inert material removed | N | | 0 | Stones,brick,clinker | Stones,brick,clinker |
| **Metals** | | | | | |
| Arsenic | M | mg/kg | 1 | 179 | 43.7 |
| Cadmium | M | mg/kg | 0.5 | 2.5 | 0.8 |
| Chromium | M | mg/kg | 5 | 64.1 | 36.2 |
| Copper | M | mg/kg | 5 | 1530 | 169 |
| Lead | M | mg/kg | 5 | 2170 | 432 |
| Mercury | M | mg/kg | 0.5 | < 0.5 | < 0.5 |
| Nickel | M | mg/kg | 5 | 180 | 43.2 |
| Selenium | M | mg/kg | 1 | < 1.0 | 1.4 |
| Zinc | M | mg/kg | 5 | 1580 | 595 |
| **Anions** | | | | | |
| Water Soluble Sulphate | M | g/l | 0.02 | 0.26 | 1.63 |
| **Inorganics** | | | | | |
| Total Cyanide | M | mg/kg | 1 | < 1.0 | < 1.0 |
| Acid Soluble Sulphate (SO4) | U | % | 0.02 | 0.26 | 0.88 |
| **Miscellaneous** | | | | | |
| Acid Neutralisation Capacity | N | mol/kg | 0.1 | < 0.1 | < 0.1 |
| Loss On Ignition (450°C) | M | % | 0.01 | 10.4 | 8.82 |
| pH | M | pH units | 0.1 | 6.7 | 7.8 |
| Soil Organic Matter | U | % | 0.1 | 4.4 | 5.3 |
| Total Organic Carbon | N | % | 0.01 | 11 | 4.0 |
| **Organics** | | | | | |
| >C8-C10 BCB | N | mg/kg | 1 | < 1.0 | 3.3 |
| >C10-C12 BCB | N | mg/kg | 1 | < 1.0 | 3.8 |
| >C12-C16 BCB | N | mg/kg | 1 | < 1.0 | < 1.0 |
| >C16-C21 BCB | N | mg/kg | 1 | 1.3 | 3.9 |
| Diesel Range Organics (>C8-C21) | N | mg/kg | 1 | < 1 | 10 |
| **Phenols** | | | | | |
| Phenol | M | mg/kg | 1 | < 1 | < 1 |
| M,P-Cresol | N | mg/kg | 1 | < 1 | < 1 |
| O-Cresol | N | mg/kg | 1 | < 1 | < 1 |
| 3,4-Dimethylphenol | N | mg/kg | 1 | < 1 | < 1 |
| 2,3-Dimethylphenol | M | mg/kg | 1 | < 1 | < 1 |
| 2,3,5-trimethylphenol | M | mg/kg | 1 | < 1 | < 1 |
| Total Monohydric Phenols | N | mg/kg | 5 | < 5 | < 5 |

# Results Summary

**Report No.: 19-25184, issue number 1**

| | | | | | |
|---|---|---|---|---|---|
| | | | ELAB Reference | 186140 | 186142 |
| | | | Customer Reference | | |
| | | | Sample ID | | |
| | | | Sample Type | SOIL | SOIL |
| | | | Sample Location | TP1 | HP1 |
| | | | Sample Depth (m) | 0.20 | 0.10 |
| | | | Sampling Date | 04/10/2019 | 04/10/2019 |
| **Determinand** | **Codes** | **Units** | **LOD** | | |
| **Polyaromatic hydrocarbons** | | | | | |
| Naphthalene | M | mg/kg | 0.1 | 0.6 | < 0.1 |
| Acenaphthylene | M | mg/kg | 0.1 | 0.1 | < 0.1 |
| Acenaphthene | M | mg/kg | 0.1 | 1.9 | < 0.1 |
| Fluorene | M | mg/kg | 0.1 | 1.0 | < 0.1 |
| Phenanthrene | M | mg/kg | 0.1 | 8.2 | 0.8 |
| Anthracene | M | mg/kg | 0.1 | 1.7 | 0.2 |
| Fluoranthene | M | mg/kg | 0.1 | 10.2 | 1.1 |
| Pyrene | M | mg/kg | 0.1 | 9.3 | 1.1 |
| Benzo(a)anthracene | M | mg/kg | 0.1 | 4.4 | 0.4 |
| Chrysene | M | mg/kg | 0.1 | 5.2 | 0.7 |
| Benzo(b)fluoranthene | M | mg/kg | 0.1 | 3.8 | 0.6 |
| Benzo(k)fluoranthene | M | mg/kg | 0.1 | 3.9 | 0.7 |
| Benzo(a)pyrene | M | mg/kg | 0.1 | 4.0 | 0.5 |
| Indeno(1,2,3-cd)pyrene | M | mg/kg | 0.1 | 2.5 | 0.4 |
| Dibenzo(a,h)anthracene | M | mg/kg | 0.1 | 0.5 | < 0.1 |
| Benzo[g,h,i]perylene | M | mg/kg | 0.1 | 2.4 | 0.4 |
| Coronene | N | mg/kg | 0.1 | 1.0 | 0.3 |
| Total PAH(16) | M | mg/kg | 0.4 | 59.6 | 7.2 |
| Total PAH (Including Coronene GC-FID) | N | mg/kg | 2 | 61 | 7 |
| **BTEX** | | | | | |
| Benzene | M | ug/kg | 10 | < 10.0 | < 10.0 |
| Toluene | M | ug/kg | 10 | < 10.0 | < 10.0 |
| Ethylbenzene | M | ug/kg | 10 | < 10.0 | < 10.0 |
| Xylenes | M | ug/kg | 10 | < 10.0 | < 10.0 |
| MTBE | N | ug/kg | 10 | < 10.0 | < 10.0 |
| Total BTEX | M | mg/kg | 0.01 | < 0.01 | < 0.01 |
| **TPH CWG** | | | | | |
| >C5-C6 Aliphatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 |
| >C6-C8 Aliphatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 |
| >C8-C10 Aliphatic | N | mg/kg | 1 | < 1.0 | 3.5 |
| >C10-C12 Aliphatic | N | mg/kg | 1 | < 1.0 | 3.8 |
| >C12-C16 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 |
| >C16-C21 Aliphatic | N | mg/kg | 1 | < 1.0 | 1.6 |
| >C21-C35 Aliphatic | N | mg/kg | 1 | < 1.0 | 127 |
| >C35-C40 Aliphatic | N | mg/kg | 1 | < 1.0 | 71.2 |
| >C5-C7 Aromatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 |
| >C7-C8 Aromatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 |
| >C8-C10 Aromatic | N | mg/kg | 1 | < 1.0 | 2.1 |
| >C10-C12 Aromatic | N | mg/kg | 1 | < 1.0 | 2.5 |
| >C12-C16 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 |
| >C16-C21 Aromatic | N | mg/kg | 1 | 1.6 | 1.8 |
| >C21-C35 Aromatic | N | mg/kg | 1 | 10.2 | 159 |
| >C35-C40 Aromatic | N | mg/kg | 1 | 1.8 | 100 |
| Total (>C5-C40) Ali/Aro | N | mg/kg | 1 | 13.7 | 472 |
| **Total Petroleum Hydrocarbons** | | | | | |
| Mineral Oil | M | mg/kg | 5 | ^ < 5 | ^ 334 |
| **PCB (ICES 7 congeners)** | | | | | |
| PCB (Total of 7 Congeners) | M | mg/kg | 0.03 | < 0.03 | < 0.03 |

Tests marked N are not UKAS accredited.

# Results Summary

**Report No.: 19-25184, issue number 1**

| WAC Analysis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Elab Ref:** | 186142 | | | | | **Landfill Waste Acceptance Criteria Limits*** | | |
| **Sample Date:** | 04/10/2019 | | | | | **Inert Waste Landfill** | **Stable Non-reactive Hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Sample ID:** | HP1 | | | | | | | |
| **Depth (m)** | 0.1 | | | | | | | |
| **Site:** | English Martyrs | | | | | | | |
| | | | | | | | | |
| **Determinand** | | **Code** | **Units** | | | | | |
| Total Organic Carbon | | N | % | | 4.00 | 3 | 5 | 6 |
| Loss on Ignition | | M | % | | 8.8 | -- | -- | 10 |
| Total BTEX | | M | mg/kg | | < 0.01 | 6 | -- | -- |
| Total PCBs (7 congeners) | | M | mg/kg | | < 0.03 | 1 | -- | -- |
| TPH Total WAC | | M | mg/kg | | 334 | 500 | -- | -- |
| Total (of 17) PAHs | | N | mg/kg | | 7.0 | 100 | -- | -- |
| pH | | M | | | 7.8 | -- | >6 | -- |
| Acid Neutralisation Capacity | | N | mol/kg | | < 0.1 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1** | | **10:1** | **Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg** | | |
| | | | **mg/l** | | **mg/kg** | | | |
| Arsenic | | N | < 0.005 | | < 0.05 | 0.5 | 2 | 25 |
| Barium | | N | 0.192 | | 1.92 | 20 | 100 | 300 |
| Cadmium | | N | < 0.001 | | < 0.01 | 0.04 | 1 | 5 |
| Chromium | | N | < 0.005 | | < 0.05 | 0.5 | 10 | 70 |
| Copper | | N | 0.007 | | 0.07 | 2 | 50 | 100 |
| Mercury | | N | < 0.005 | | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum | | N | < 0.005 | | < 0.05 | 0.5 | 10 | 30 |
| Nickel | | N | 0.001 | | < 0.05 | 0.4 | 10 | 40 |
| Lead | | N | < 0.001 | | < 0.05 | 0.5 | 10 | 50 |
| Antimony | | N | < 0.005 | | < 0.05 | 0.06 | 0.7 | 5 |
| Selenium | | N | < 0.005 | | < 0.05 | 0.1 | 0.5 | 7 |
| Zinc | | N | 0.016 | | 0.16 | 4 | 50 | 200 |
| Chloride | | N | 9 | | 93.00 | 800 | 15000 | 25000 |
| Fluoride | | N | < 5 | | < 10 | 10 | 150 | 500 |
| Sulphate | | N | 626 | | 6260.00 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | | N | 892 | | 8920.00 | 4000 | 60000 | 100000 |
| Phenol Index | | N | < 0.01 | | < 0.10 | 1 | - | - |
| Dissolved Organic Carbon | | N | 14.700 | | 147.00 | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | | |
| pH | | N | 7.7 | | | | | |
| Conductivity (uS/cm) | | N | 1330 | | | | | |
| Dry mass of test portion (g) | | | 100.000 | | | | | |
| Dry Matter (%) | | | 77 | | | | | |
| Moisture (%) | | | 30 | | | | | |
| Eluent Volume (ml) | | | 932 | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.

# Results Summary

**Report No.: 19-25184, issue number 1**

| WAC Analysis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Elab Ref:** | 186140 | | | | | **Landfill Waste Acceptance Criteria Limits*** | | |
| **Sample Date:** | 04/10/2019 | | | | | **Inert Waste Landfill** | **Stable Non-reactive Hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Sample ID:** | TP1 | | | | | | | |
| **Depth (m)** | 0.2 | | | | | | | |
| **Site:** | English Martyrs | | | | | | | |
| | | | | | | | | |
| **Determinand** | | **Code** | **Units** | | | | | |
| Total Organic Carbon | | N | % | | 11.00 | 3 | 5 | 6 |
| Loss on Ignition | | M | % | | 10.4 | -- | -- | 10 |
| Total BTEX | | M | mg/kg | | < 0.01 | 6 | -- | -- |
| Total PCBs (7 congeners) | | M | mg/kg | | < 0.03 | 1 | -- | -- |
| TPH Total WAC | | M | mg/kg | | < 5 | 500 | -- | -- |
| Total (of 17) PAHs | | N | mg/kg | | 61.0 | 100 | -- | -- |
| pH | | M | | | 6.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | | N | mol/kg | | < 0.1 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1** | | **10:1** | **Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg** | | |
| | | | **mg/l** | | **mg/kg** | | | |
| Arsenic | | N | < 0.005 | | < 0.05 | 0.5 | 2 | 25 |
| Barium | | N | 0.058 | | 0.58 | 20 | 100 | 300 |
| Cadmium | | N | < 0.001 | | < 0.01 | 0.04 | 1 | 5 |
| Chromium | | N | < 0.005 | | < 0.05 | 0.5 | 10 | 70 |
| Copper | | N | 0.010 | | 0.10 | 2 | 50 | 100 |
| Mercury | | N | < 0.005 | | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum | | N | < 0.005 | | < 0.05 | 0.5 | 10 | 30 |
| Nickel | | N | 0.002 | | < 0.05 | 0.4 | 10 | 40 |
| Lead | | N | 0.008 | | 0.08 | 0.5 | 10 | 50 |
| Antimony | | N | 0.006 | | 0.06 | 0.06 | 0.7 | 5 |
| Selenium | | N | < 0.005 | | < 0.05 | 0.1 | 0.5 | 7 |
| Zinc | | N | 0.020 | | 0.20 | 4 | 50 | 200 |
| Chloride | | N | < 5 | | < 50 | 800 | 15000 | 25000 |
| Fluoride | | N | < 5 | | < 10 | 10 | 150 | 500 |
| Sulphate | | N | 14 | | 137.00 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | | N | 49 | | 489.00 | 4000 | 60000 | 100000 |
| Phenol Index | | N | < 0.01 | | < 0.10 | 1 | - | - |
| Dissolved Organic Carbon | | N | 9.760 | | 98.00 | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | | |
| pH | | N | 7.3 | | | | | |
| Conductivity (uS/cm) | | N | 73 | | | | | |
| Dry mass of test portion (g) | | | 100.000 | | | | | |
| Dry Matter (%) | | | 76 | | | | | |
| Moisture (%) | | | 31 | | | | | |
| Eluent Volume (ml) | | | 940 | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.

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## Results Summary

**Report No.: 19-25184, issue number 1**

### Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

| Elab No | Depth (m) | Clients Reference | Description of Sample Matrix # | Asbestos Identification | Gravimetric Analysis Total (%) | Gravimetric Analysis by ACM Type (%) | Free Fibre Analysis (%) | Total Asbestos (%) |
|---|---|---|---|---|---|---|---|---|
| 186140 | 0.20 | TP1 | Brown Sandy Soil,Stonres,Pottery,Clinker | No asbestos detected | n/t | n/t | n/t | n/t |
| 186142 | 0.10 | HP1 | Brown Sandy Soil,Stones,Brick,Twigs | No asbestos detected | n/t | n/t | n/t | n/t |

# Method Summary

**Report No.: 19-25184, issue number 1**

| Parameter | Codes | Analysis Undertaken On | Date Tested | Method Number | Technique |
|---|---|---|---|---|---|
| **Soil** | | | | | |
| TOT PAH (GC-FID) | N | As submitted sample | 11/10/2019 | | GC-FID |
| pH | M | Air dried sample | 15/10/2019 | 113 | Electromeric |
| Acid Soluble Sulphate | U | Air dried sample | 11/10/2019 | 115 | Ion Chromatography |
| Total Petroleum Hydrocarbons in solids | M | As submitted sample | 10/10/2019 | 117 | GC-FID |
| Aqua regia extractable metals | M | Air dried sample | 10/10/2019 | 118 | ICPMS |
| PCB (ICES 7 congeners) | M | Air dried sample | 10/10/2019 | 120 | GC-MS |
| Phenols in solids | M | As submitted sample | 10/10/2019 | 121 | HPLC |
| Loss on ignition at 450 deg C | M | Air dried sample | 11/10/2019 | 129 | Gravimetry |
| PAH (GC-FID) | M | As submitted sample | 10/10/2019 | 133 | GC-FID |
| Water soluble anions | M | Air dried sample | 10/10/2019 | 172 | Ion Chromatography |
| Low range Aliphatic hydrocarbons soil | N | As submitted sample | 11/10/2019 | 181 | GC-MS |
| Low range Aromatic hydrocarbons soil | N | As submitted sample | 11/10/2019 | 181 | GC-MS |
| BTEX in solids | M | As submitted sample | 11/10/2019 | 181A | GC-MS |
| Total cyanide | M | As submitted sample | 10/10/2019 | 204 | Colorimetry |
| Total organic carbon/Total sulphur | N | Air dried sample | 11/10/2019 | 210 | IR |
| Aliphatic hydrocarbons in soil | N | As submitted sample | 10/10/2019 | 214 | GC-FID |
| Aliphatic/Aromatic hydrocarbons in soil | N | As submitted sample | 11/10/2019 | 214 | GC-FID |
| Aromatic hydrocarbons in soil | N | As submitted sample | 10/10/2019 | 214 | GC-FID |
| Basic carbon banding in soil | N | As submitted sample | 10/10/2019 | 218 | GC-FID |
| Diesel range organics in soil | N | As submitted sample | 14/10/2019 | 257 | GC-FID |
| Soil organic matter | U | Air dried sample | 14/10/2019 | BS1377:P3 | Titrimetry |
| Acid neutralisation capacity | N | Air dried sample | 15/10/2019 | 737 | |
| Asbestos identification | U | Air dried sample | 10/10/2019 | PMAN | Microscopy |

## Leachate

Tests marked N are not UKAS accredited

# Report Information

**Report No.: 19-25184, issue number 1**

**Key**

| | |
|---|---|
| U | hold UKAS accreditation |
| M | hold MCERTS and UKAS accreditation |
| N | do not currently hold UKAS accreditation |
| ^ | MCERTS accreditation not applicable for sample matrix |
| * | UKAS accreditation not applicable for sample matrix |
| S | Subcontracted to approved laboratory UKAS Accredited for the test |
| SM | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| NS | Subcontracted to approved laboratory. UKAS accreditation is not applicable. |
| I/S | Insufficient Sample |
| U/S | Unsuitable sample |
| n/t | Not tested |
| < | means "less than" |
| > | means "greater than" |

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client

**Deviation Codes**

| | |
|---|---|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

**Sample Retention and Disposal**

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage