Our ref: 70007995-002/10681

30 November 2016

Laura Miller
Contaminated Land Section
Environmental Health
Manchester City Council
Hammerstone Road
Gorton
Manchester
M18 8EQ

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Dear Laura

**Re: Redrow Moston Site 6 (St John Gardens), Ashley Lane, Manchester**
**Garden Topsoil Validation – Plots 9 and 10.**

**Validation Requirements**

A Remediation Strategy for Moston Site 6 (Ashley Lane) agreed with Manchester City Council (MCC) requires validation of residential gardens areas. The agreed strategy (Ref: 12121870/002/9121(3), dated March 2010) requires the following:

- Where Made Ground is present at the surface in areas of private gardens and public open space, placement of a clean cover is required. The thickness of the cover layer should be a minimum of 600mm.
- Where natural soils (i.e. Glacial Till) are present at the surface, no capping layer is considered necessary, subject to appropriate chemical validation of the natural surface soils at a frequency of 1 per 200m$^3$.
- Cover soils (site won or imported) should have chemical concentrations within the thresholds presented in Table 1 of the Remediation Strategy. Validation testing should be undertaken on the basis of one test for topsoil and subsoil in every 4 plots.

**Cover System Validation Visit**

In accordance with the validation approach detailed above, WSP | Parsons Brinckerhoff attended the site on 17 November 2016 to observe the placed cover layer depth in the rear gardens of Plots 9 and 10. Photographs from the site visit are provided in Appendix A.

Trial holes were excavated by hand through the topsoil into the underlying subsoil to a depth of 600mm.

The emplaced topsoil was found to be in excess of 150mm thickness, appeared free from materials of anthropogenic origin (e.g. bricks/plastic) and had no odour or other feature which might suggest contamination.

The underlying subsoil comprised clay and contained infrequent objects of anthropogenic origin including bricks, ceramics, and concrete fragments. These objects were not deemed representative of the sub-soil as a whole; rather they appear to have been inadvertently worked into the clay during construction, and therefore not indicative made ground being present.

**Cover System Source and Suitability**

The imported topsoil supplied to Plots 9 and 10 is understood to have been obtained from a greenfield source via the supplier 'Drapers'. WSP | Parsons Brinckerhoff understands that this is the same source of material that has been used previously on Moston 6 and also in the garden areas on the Moston 5 Redrow development.

The following chemical analysis has been carried out by WSP | Parsons Brinckerhoff on samples of topsoil and subsoil on the Moston 5 and 6 sites to confirm the suitability of the material for the cover system:

- **March 2015**: Topsoil (1 sample) and subsoil (1 sample) placed at Moston 6. These results (SDG: 150311-22) are presented in Appendix B.
- **March 2015**: Topsoil (1 sample) from Moston 5. The results (SDG: 150319-126) are presented in Appendix C.
- **June 2015:** Topsoil (1 sample) and subsoil (1 sample) laid in Moston 6 Plot 87. The results (SDG: 150617-71) are presented in Appendix D.
- **January 2016**: Topsoil (1 sample) and subsoil (1 sample) laid in Plot 42 on Moston 5. The results (SDG: 160128-93) are presented in Appendix E.
- **May 2016:** Topsoil (1 sample) and subsoil (1 sample) laid in Plot 44 on Moston 5. The results (SDG: 160430-55) are presented in Appendix F.

The available laboratory results indicate the topsoil and subsoil being used in rear gardens at Moston 6 are acceptable for a residential cover system.

The human health Category 4 Screening Levels (C4SLs) published in April 2014 (which have been formally adopted by the NHBC) have been used as a supplementary screening criteria when assessing the suitability of the cover system in residential gardens. The C4SL for Benzo(a)pyrene is 5mg/kg.

**Conclusion**

Based on the available information, it is the opinion of WSP | Parsons Brinckerhoff that the topsoil and subsoil placed in the rear garden of Plots 9 and 10 at Moston Site 6 meets MCC's validation requirements.

We trust that the forgoing meets your requirements and look forward to receiving your written approval at your earliest opportunity. In the meantime, should you have any queries, please do not hesitate to contact us.

Yours sincerely

Jones, Stephen
On behalf of Robert Crookes
2016.11.30 10:28:53 Z

**Robert Crookes**
Graduate Environmental Consultant

Appendix A: Photographs from validation of Plots 9 & 10.
Appendix B: Moston 6 - Topsoil Analysis Report – WSP, March 2015 SDG: 150311-22
Appendix C: Moston 5 - Topsoil Analysis Report – WSP, March 2015 SDG: 150319-126
Appendix D: Moston 6 - Topsoil and Subsoil Analysis Report – WSP June 2015 SDG: 150617-71
Appendix E: Moston 5 - Topsoil Analysis Report – WSP, January 2016 SDG: 160128-93
Appendix F: Moston 5 – Topsoil Analysis Report – WSP, May 2016 SDG: 160430-55
Appendix G: Moston 6 - Topsoil Analysis Report – WSP, June 2016 SDG: 160521 - 38

CC: chris.tweedle@redrow.co.uk
callum.baldwin@redrow.co.uk

# APPENDIX A
# Photographs from validation of Plots 9 & 10




Photo 1: Plot 9



Photo 2: Plot 9



Photo 3: Plot 9



Photo 4: Plot 9




Photo 5: Plot 10



Photo 6: Plot 10



Photo 7: Plot 10



Photo 8: Plot 10

# APPENDIX B
# Moston 6 March 2015
# SDG 150311-22

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP Environmental
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP

**Attention:** Jess Kinchington

# CERTIFICATE OF ANALYSIS

| | |
|---|---|
| **Date:** | 19 March 2015 |
| **Customer:** | H_WSP_MAN |
| **Sample Delivery Group (SDG):** | 150311-22 |
| **Your Reference:** | 70007995 (Moston Site 6) |
| **Location:** | Moston Site 6 |
| **Report No:** | 306021 |

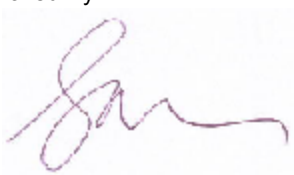
**This report has been revised and directly supersedes 305973 in its entirety.**

We received 2 samples on Wednesday March 11, 2015 and 2 of these samples were scheduled for analysis which was completed on Thursday March 19, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**
Operations Manager

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Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 10980508 | Moston 6 SS | ES | 0.00 - 0.00 | 09/03/2015 |
| 10980503 | Moston 6 TS | ES | 0.00 - 0.00 | 09/03/2015 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## SOLID

**Results Legend**

X Test

N No Determination Possible

| Lab Sample No(s) | | | 10980508 | 10980503 |
|---|---|---|---|---|
| Customer Sample Reference | | | Moston 6 SS | Moston 6 TS |
| AGS Reference | | | ES | ES |
| Depth (m) | | | 0.00 - 0.00 | 0.00 - 0.00 |
| Container | | | 250g Amber Jar / 400g Tub (ALE214) / 60g VOC (ALE215) | 250g Amber Jar / 400g Tub (ALE214) / 60g VOC (ALE215) |
| Asbestos ID in Solid Samples | All | NDPs: 0 Tests: 2 | | X / X |
| EPH CWG (Aliphatic) GC (S) | All | NDPs: 0 Tests: 2 | X | X |
| EPH CWG (Aromatic) GC (S) | All | NDPs: 0 Tests: 2 | X | X |
| GRO by GC-FID (S) | All | NDPs: 0 Tests: 2 | X | X |
| Metals in solid samples by OES | All | NDPs: 0 Tests: 2 | X | X |
| PAH by GCMS | All | NDPs: 0 Tests: 2 | X | X |
| pH | All | NDPs: 0 Tests: 2 | X | X |
| Sample description | All | NDPs: 0 Tests: 2 | X | X |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 2 | X | X |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Sample Descriptions

## Grain Sizes

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **very fine** | <0.063mm | **fine** | 0.063mm - 0.1mm | **medium** | 0.1mm - 2mm | **coarse** | 2mm - 10mm | **very coarse** | >10mm |

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Grain size | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|---|
| 10980508 | Moston 6 SS | 0.00 - 0.00 | Dark Brown | Clay | <0.063 mm | Vegetation | Stones |
| 10980503 | Moston 6 TS | 0.00 - 0.00 | Dark Brown | Clay | <0.063 mm | Stones | Brick |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Moston 6 SS | Moston 6 TS |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 09/03/2015 | 09/03/2015 |
| | | | Sampled Time | - | - |
| | | | Date Received | 11/03/2015 | 11/03/2015 |
| | | | SDG Ref | 150311-22 | 150311-22 |
| | | | Lab Sample No.(s) | 10980508 | 10980503 |
| | | | AGS Reference | ES | ES |
| Moisture Content Ratio (% of as received sample) | % | PM024 | | 17 | 14 |
| pH | 1 pH Units | TM133 | | 8.25 M | 8.03 M |
| Arsenic | <0.6 mg/kg | TM181 | | 7.63 M | 7.13 M |
| Cadmium | <0.02 mg/kg | TM181 | | 0.555 M | 0.321 M |
| Chromium | <0.9 mg/kg | TM181 | | 24.1 M | 19.7 M |
| Copper | <1.4 mg/kg | TM181 | | 21.8 M | 20.4 M |
| Lead | <0.7 mg/kg | TM181 | | 24.7 M | 23 M |
| Mercury | <0.14 mg/kg | TM181 | | <0.14 M | <0.14 M |
| Nickel | <0.2 mg/kg | TM181 | | 23.9 M | 23.4 M |
| Selenium | <1 mg/kg | TM181 | | <1 # | <1 # |
| Zinc | <1.9 mg/kg | TM181 | | 50.6 M | 53.6 M |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## PAH by GCMS

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Moston 6 SS | Moston 6 TS |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 09/03/2015 | 09/03/2015 |
| | | | Sampled Time | - | - |
| | | | Date Received | 11/03/2015 | 11/03/2015 |
| | | | SDG Ref | 150311-22 | 150311-22 |
| | | | Lab Sample No.(s) | 10980508 | 10980503 |
| | | | AGS Reference | ES | ES |
| Naphthalene-d8 % recovery** | % | TM218 | | 101 | 103 |
| Acenaphthene-d10 % recovery** | % | TM218 | | 101 | 105 |
| Phenanthrene-d10 % recovery** | % | TM218 | | 99.8 | 103 |
| Chrysene-d12 % recovery** | % | TM218 | | 94.9 | 99.3 |
| Perylene-d12 % recovery** | % | TM218 | | 109 | 115 |
| Naphthalene | <0.009 mg/kg | TM218 | | 0.0379 M | <0.009 M |
| Acenaphthylene | <0.012 mg/kg | TM218 | | <0.012 M | <0.012 M |
| Acenaphthene | <0.008 mg/kg | TM218 | | 0.0613 M | <0.008 M |
| Fluorene | <0.01 mg/kg | TM218 | | 0.0564 M | <0.01 M |
| Phenanthrene | <0.015 mg/kg | TM218 | | 0.417 M | <0.015 M |
| Anthracene | <0.016 mg/kg | TM218 | | 0.105 M | <0.016 M |
| Fluoranthene | <0.017 mg/kg | TM218 | | 0.497 M | 0.0433 M |
| Pyrene | <0.015 mg/kg | TM218 | | 0.393 M | 0.0375 M |
| Benz(a)anthracene | <0.014 mg/kg | TM218 | | 0.189 M | <0.014 M |
| Chrysene | <0.01 mg/kg | TM218 | | 0.171 M | 0.0232 M |
| Benzo(b)fluoranthene | <0.015 mg/kg | TM218 | | 0.21 M | 0.04 M |
| Benzo(k)fluoranthene | <0.014 mg/kg | TM218 | | 0.0737 M | <0.014 M |
| Benzo(a)pyrene | <0.015 mg/kg | TM218 | | 0.157 M | 0.0287 M |
| Indeno(1,2,3-cd)pyrene | <0.018 mg/kg | TM218 | | 0.0821 M | <0.018 M |
| Dibenzo(a,h)anthracene | <0.023 mg/kg | TM218 | | 0.0296 M | <0.023 M |
| Benzo(g,h,i)perylene | <0.024 mg/kg | TM218 | | 0.104 M | 0.0281 M |
| PAH, Total Detected USEPA 16 | <0.118 mg/kg | TM218 | | 2.58 | 0.201 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## TPH CWG (S)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Moston 6 SS | Moston 6 TS |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 09/03/2015 | 09/03/2015 |
| | | | Sampled Time | - | - |
| | | | Date Received | 11/03/2015 | 11/03/2015 |
| | | | SDG Ref | 150311-22 | 150311-22 |
| | | | Lab Sample No.(s) | 10980508 | 10980503 |
| | | | AGS Reference | ES | ES |
| GRO Surrogate % recovery** | % | TM089 | | 71 | 79 |
| GRO TOT (Moisture Corrected) | <0.044 mg/kg | TM089 | | 0.18 M | <0.044 M |
| Methyl tertiary butyl ether (MTBE) | <0.005 mg/kg | TM089 | | <0.005 M | <0.005 M |
| Benzene | <0.01 mg/kg | TM089 | | <0.01 M | <0.01 M |
| Toluene | <0.002 mg/kg | TM089 | | <0.002 M | 0.00234 M |
| Ethylbenzene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M |
| m,p-Xylene | <0.006 mg/kg | TM089 | | <0.006 M | <0.006 M |
| o-Xylene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M |
| sum of detected mpo xylene by GC | <0.009 mg/kg | TM089 | | <0.009 | <0.009 |
| sum of detected BTEX by GC | <0.024 mg/kg | TM089 | | <0.024 | <0.024 |
| Aliphatics >C5-C6 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 |
| Aliphatics >C6-C8 | <0.01 mg/kg | TM089 | | 0.0168 | <0.01 |
| Aliphatics >C8-C10 | <0.01 mg/kg | TM089 | | 0.0336 | <0.01 |
| Aliphatics >C10-C12 | <0.01 mg/kg | TM089 | | 0.0552 | <0.01 |
| Aliphatics >C12-C16 | <0.1 mg/kg | TM173 | | 1.66 | 4.34 |
| Aliphatics >C16-C21 | <0.1 mg/kg | TM173 | | 5.05 | 8.31 |
| Aliphatics >C21-C35 | <0.1 mg/kg | TM173 | | 108 | 41.3 |
| Aliphatics >C35-C44 | <0.1 mg/kg | TM173 | | 51.3 | 16.4 |
| Total Aliphatics >C12-C44 | <0.1 mg/kg | TM173 | | 166 | 70.4 |
| Aromatics >EC5-EC7 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 |
| Aromatics >EC7-EC8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 |
| Aromatics >EC8-EC10 | <0.01 mg/kg | TM089 | | 0.0252 | <0.01 |
| Aromatics >EC10-EC12 | <0.01 mg/kg | TM089 | | 0.0372 | <0.01 |
| Aromatics >EC12-EC16 | <0.1 mg/kg | TM173 | | 1.5 | 1.25 |
| Aromatics >EC16-EC21 | <0.1 mg/kg | TM173 | | 9.63 | 10.1 |
| Aromatics >EC21-EC35 | <0.1 mg/kg | TM173 | | 113 | 64.4 |
| Aromatics >EC35-EC44 | <0.1 mg/kg | TM173 | | 70.3 | 40.8 |
| Aromatics >EC40-EC44 | <0.1 mg/kg | TM173 | | 28.3 | 16.8 |
| Total Aromatics >EC12-EC44 | <0.1 mg/kg | TM173 | | 195 | 116 |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 mg/kg | TM173 | | 361 | 187 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Asbestos Identification - Soil

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Moston 6 SS ES<br>0.00 - 0.00<br>SOLID<br>09/03/2015<br>00:00:00<br>11/03/2015<br>22:23:53<br>150311-22<br>10980508<br>TM048 | 18/03/15 | Chris Swindells | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Moston 6 TS ES<br>0.00 - 0.00<br>SOLID<br>09/03/2015<br>00:00:00<br>11/03/2015<br>22:20:52<br>150311-22<br>10980503<br>TM048 | 18/03/15 | Chris Swindells | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Table of Results - Appendix

| Method No | Reference | Description | Wet/Dry Sample [1] | Surrogate Corrected |
|---|---|---|---|---|
| ASB_PREP | | | | |
| PM001 | | Preparation of Samples for Metals Analysis | | |
| PM024 | Modified BS 1377 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material | | |
| TM048 | HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures | Identification of Asbestos in Bulk Material | | |
| TM089 | Modified: US EPA Methods 8020 & 602 | Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12) | | |
| TM133 | BS 1377: Part 3 1990;BS 6068-2.5 | Determination of pH in Soil and Water using the GLpH pH Meter | | |
| TM173 | Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria | Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID | | |
| TM181 | US EPA Method 6010B | Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES | | |
| TM218 | Microwave extraction – EPA method 3546 | Microwave extraction - EPA method 3546 | | |

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Test Completion Dates

| **Lab Sample No(s)** | 10980508 | 10980503 |
|---|---|---|
| **Customer Sample Ref.** | Moston 6 SS | Moston 6 TS |
| **AGS Ref.** | ES | ES |
| **Depth** | 0.00 - 0.00 | 0.00 - 0.00 |
| **Type** | SOLID | SOLID |
| Asbestos ID in Solid Samples | 18-Mar-2015 | 18-Mar-2015 |
| EPH CWG (Aliphatic) GC (S) | 19-Mar-2015 | 18-Mar-2015 |
| EPH CWG (Aromatic) GC (S) | 19-Mar-2015 | 18-Mar-2015 |
| GRO by GC-FID (S) | 18-Mar-2015 | 18-Mar-2015 |
| Metals in solid samples by OES | 17-Mar-2015 | 17-Mar-2015 |
| PAH by GCMS | 16-Mar-2015 | 16-Mar-2015 |
| pH | 12-Mar-2015 | 12-Mar-2015 |
| Sample description | 11-Mar-2015 | 12-Mar-2015 |
| TPH CWG GC (S) | 19-Mar-2015 | 18-Mar-2015 |

# CERTIFICATE OF ANALYSIS

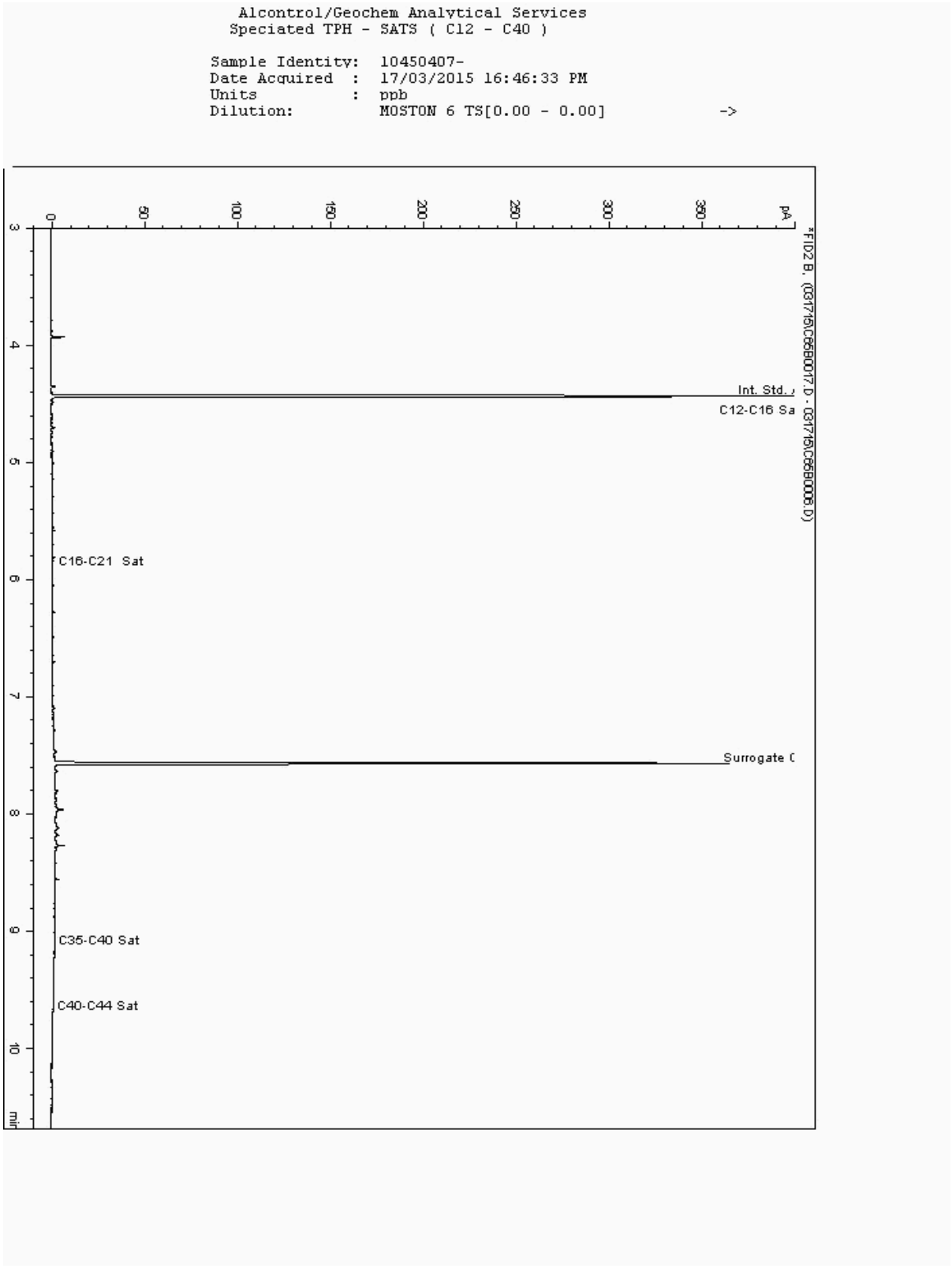
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|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Chromatogram

**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 10985503
**Sample ID :** Moston 6 TS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

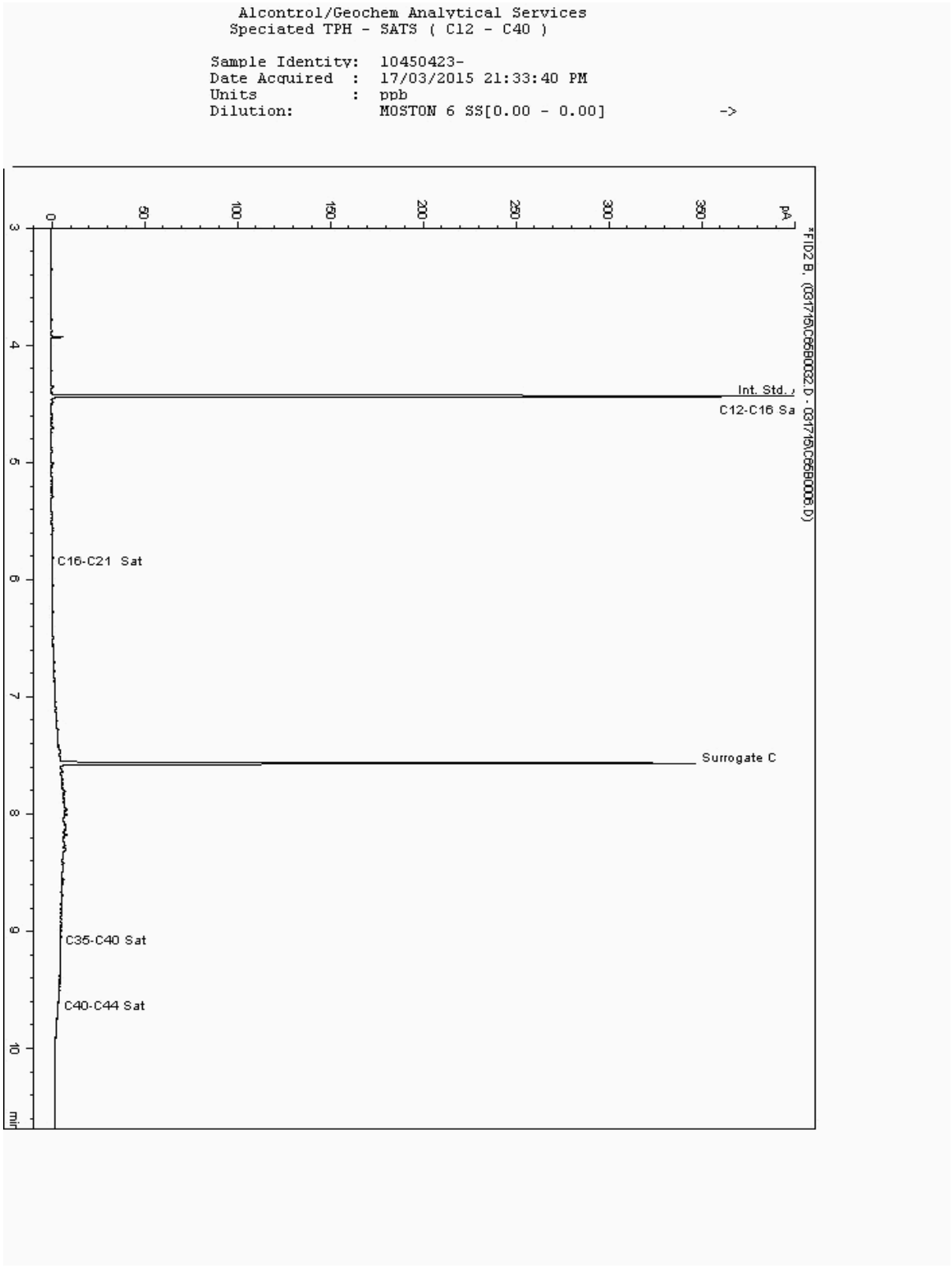
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|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Chromatogram

**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 10985509
**Sample ID :** Moston 6 SS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

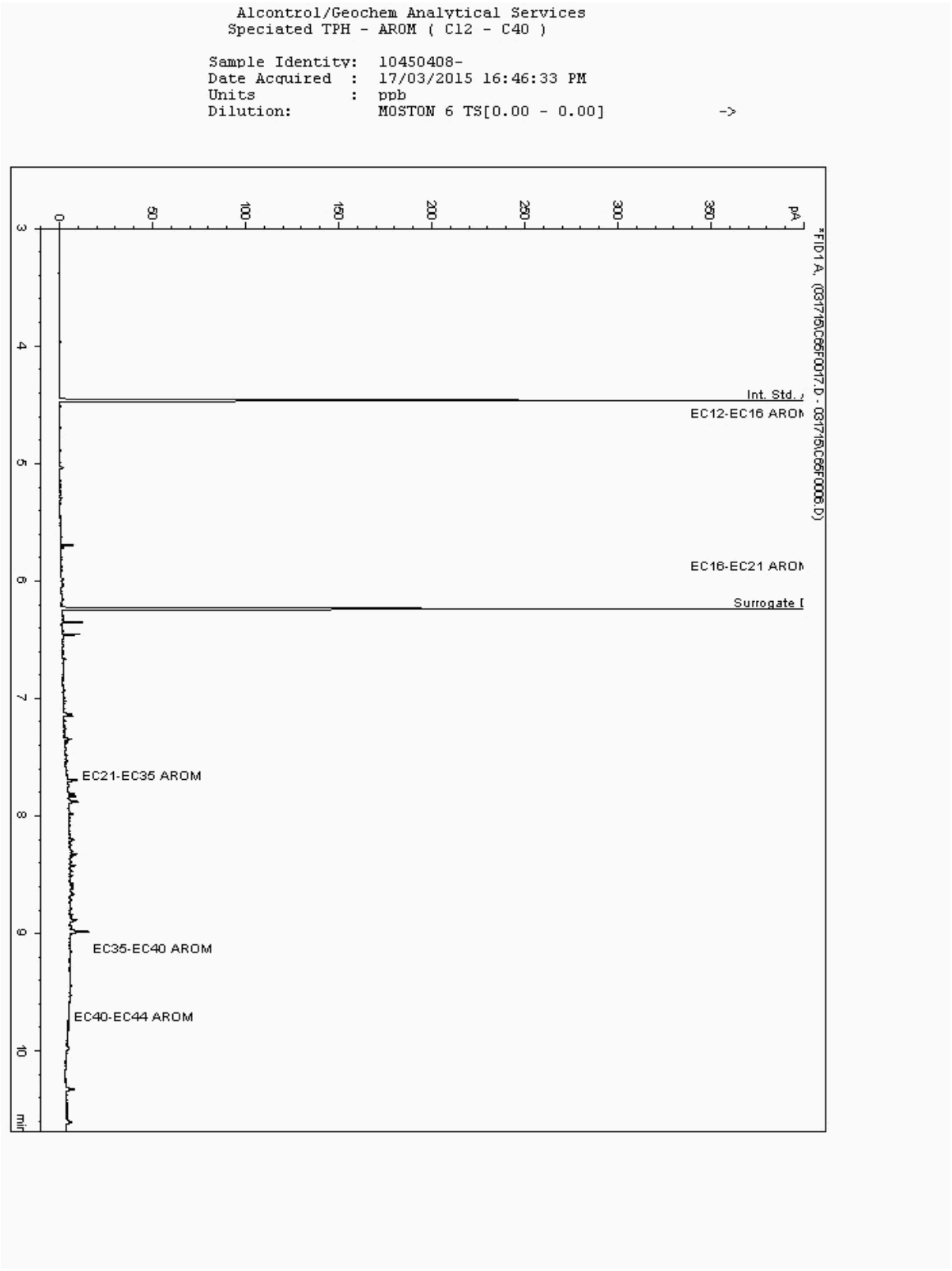
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|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Chromatogram

**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 10985503
**Sample ID :** Moston 6 TS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

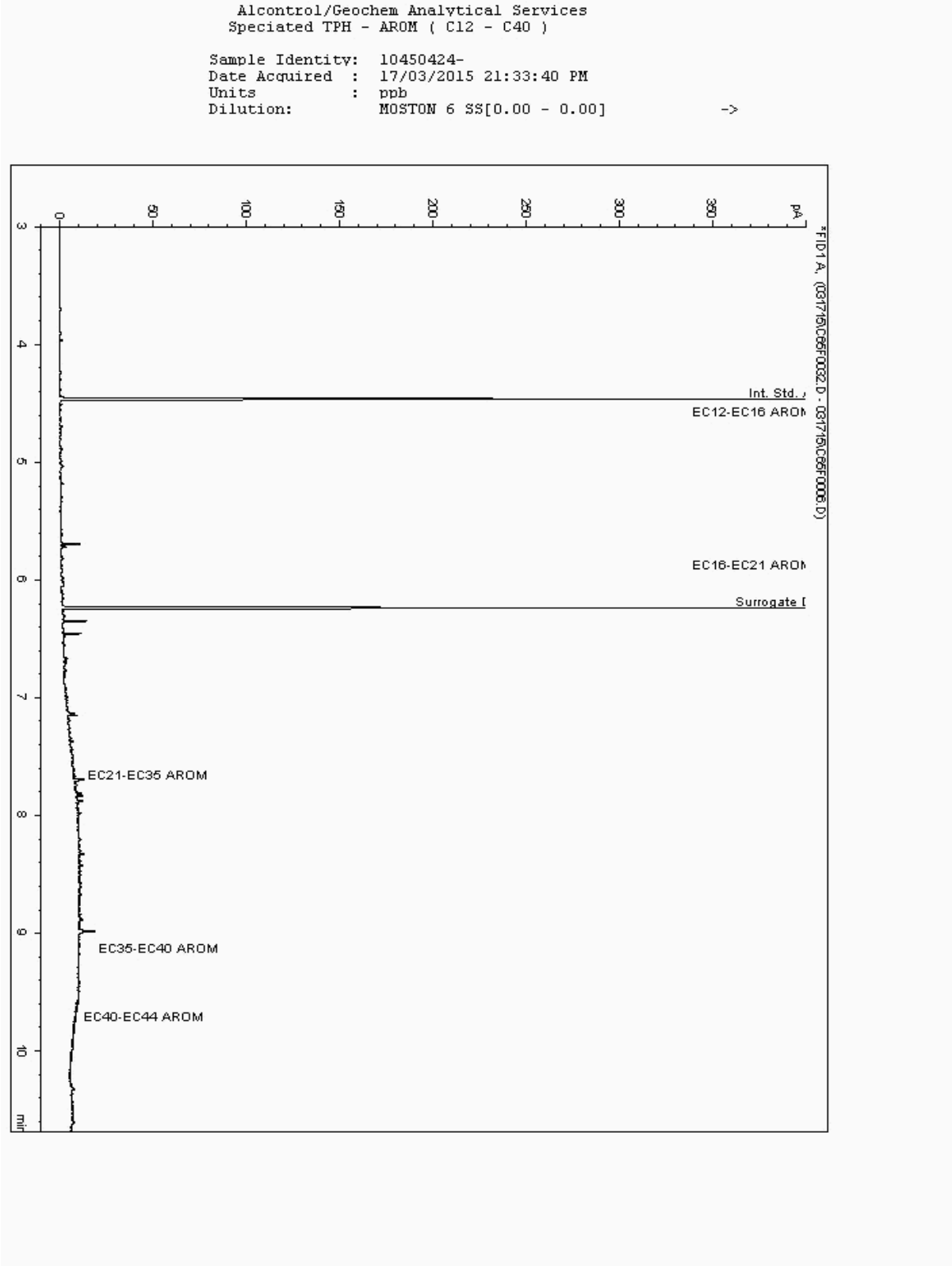
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| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Chromatogram

**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 10985509
**Sample ID :** Moston 6 SS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

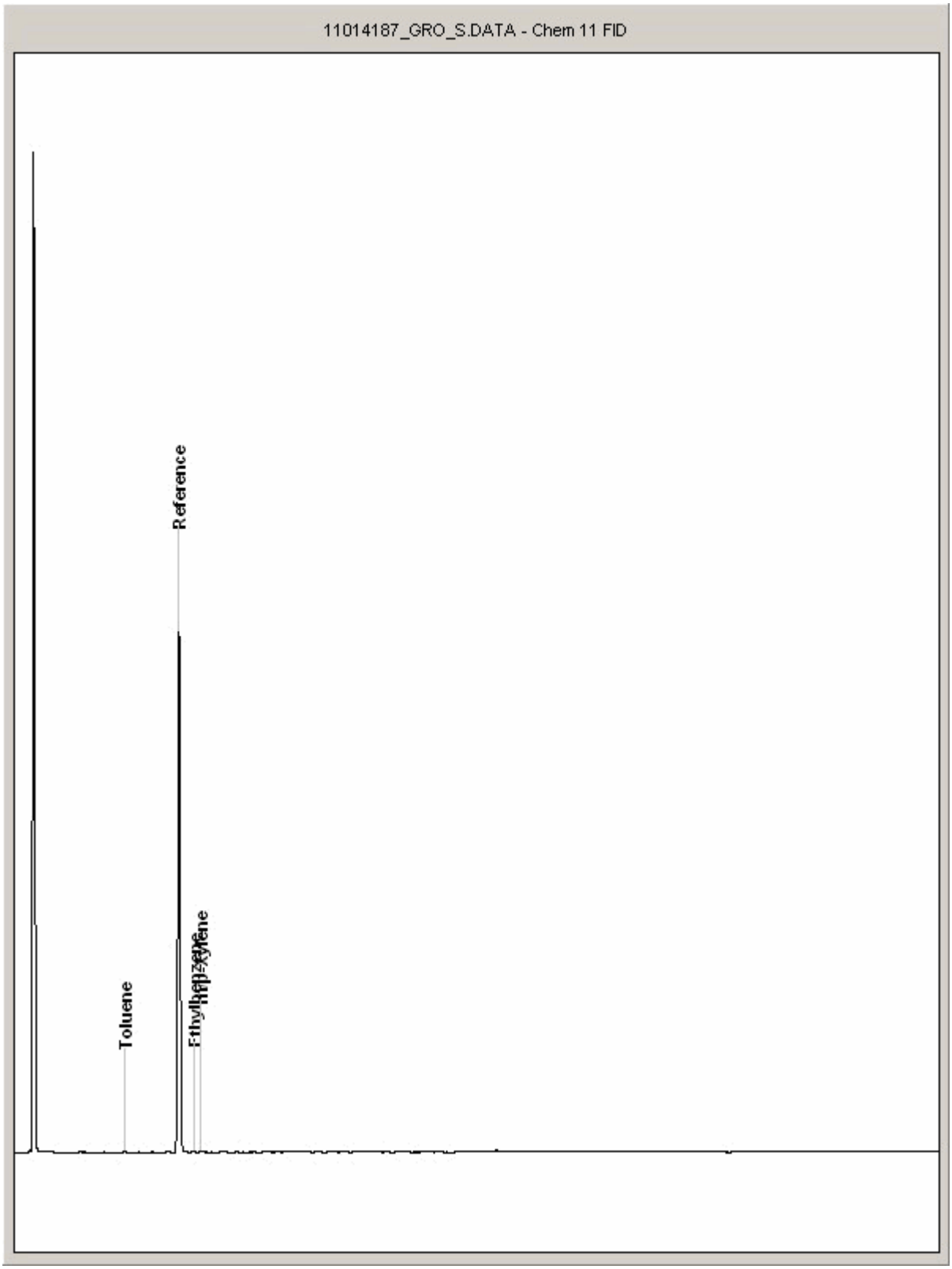
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|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 11014187
**Sample ID :** Moston 6 SS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

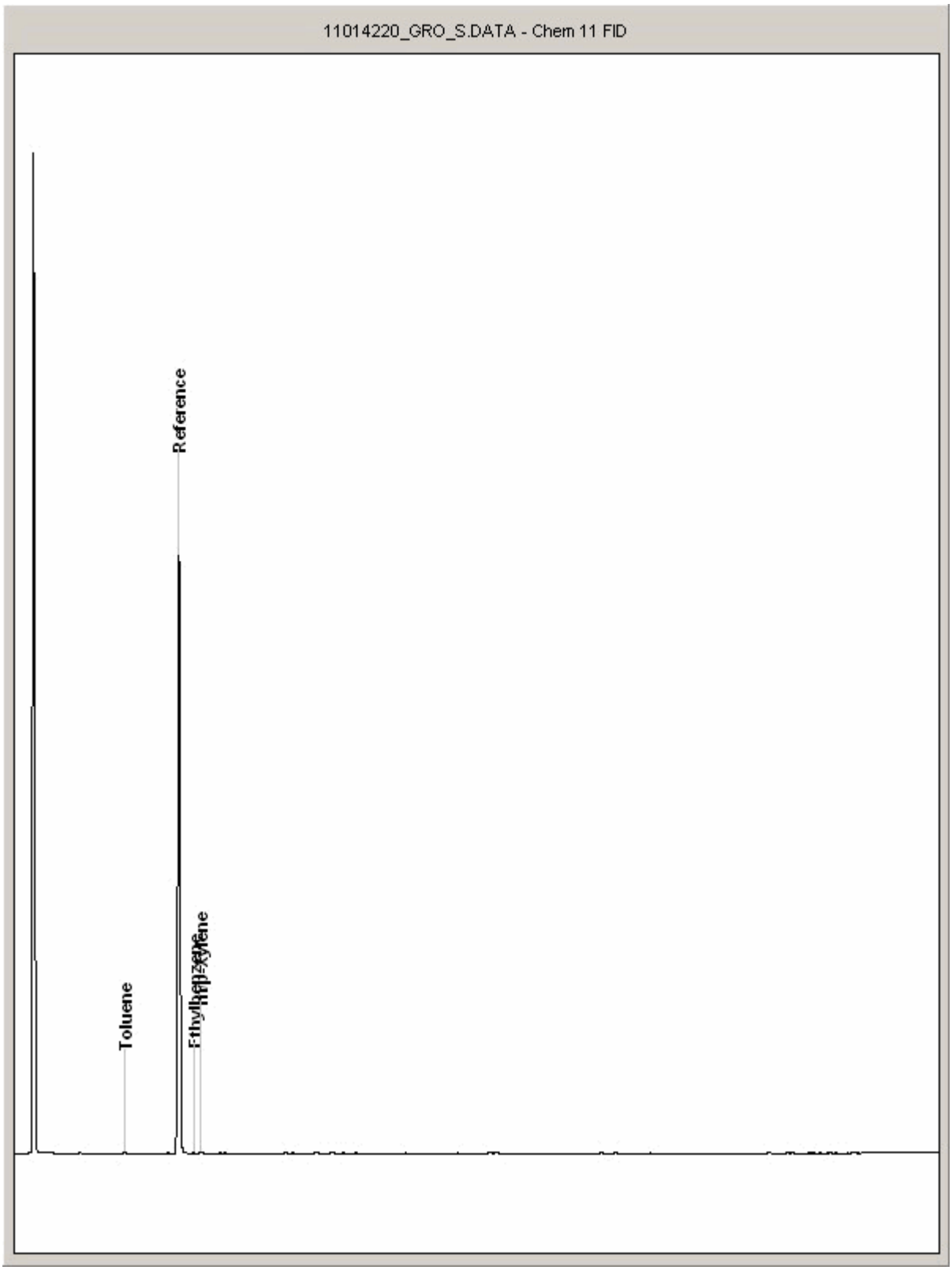
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|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 11014220
**Sample ID :** Moston 6 TS

**Depth :** 0.00 - 0.00



# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

12. Results relate only to the items tested

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not
accredited.

19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

24. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

## SOLID MATRICES EXTRACTION SUMMARY

| ANALYSIS | D/C OR WET | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|---|---|---|---|---|
| SOLVENT EXTRACTABLE MATTER | D&C | DCM | SOXTHERM | GRAVIMETRIC |
| CYCLOHEXANE EXT. MATTER | D&C | CYCLOHEXANE | SOXTHERM | GRAVIMETRIC |
| THIN LAYER CHROMATOGRAPHY | D&C | DCM | SOXTHERM | IATROSCAN |
| ELEMENTAL SULPHUR | D&C | DCM | SOXTHERM | HPLC |
| PHENOLS BY GCMS | WET | DCM | SOXTHERM | GC-MS |
| HERBICIDES | D&C | HEXANE:ACETONE | SOXTHERM | GC-MS |
| PESTICIDES | D&C | HEXANE:ACETONE | SOXTHERM | GC-MS |
| EPH (DRO) | D&C | HEXANE:ACETONE | END OVEREND | GC-FID |
| EPH (MINOIL) | D&C | HEXANE:ACETONE | END OVEREND | GC-FID |
| EPH (CLEANED UP) | D&C | HEXANE:ACETONE | END OVEREND | GC-FID |
| EPH CWG BY GC | D&C | HEXANE:ACETONE | END OVEREND | GC-FID |
| PCB TOT/ PCB CON | D&C | HEXANE:ACETONE | END OVEREND | GC-MS |
| POLYAROMATIC HYDROCARBONS (MS) | WET | HEXANE:ACETONE | MICROWAVE TM218. | GC-MS |
| C8-C40 (C6-C40) EZ FLASH | WET | HEXANE:ACETONE | SHAKER | GC-EZ |
| POLYAROMATIC HYDROCARBONS RAPID GC | WET | HEXANE:ACETONE | SHAKER | GC-EZ |
| SEMI VOLATILE ORGANIC COMPOUNDS | WET | DCM:ACETONE | SONICATE | GC-MS |

## LIQUID MATRICES EXTRACTION SUMMARY

| ANALYSIS | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|---|---|---|---|
| PAH MS | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GCMS |
| EPH | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GC FID |
| EPH CWG | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GC FID |
| MINERAL OIL | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GC FID |
| PCB 7 CONGENERS | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GCMS |
| PCB TOTAL | HEXANE | STIRRED EXTRACTION (STIR -BAR) | GCMS |
| SVOC | DCM | LIQUID/LIQUID SHAKE | GCMS |
| FREE SULPHUR | DCM | SOLID PHASE EXTRACTION | HPLC |
| PEST OCP/OPP | DCM | LIQUID/LIQUID SHAKE | GCMS |
| TRIAZINE HERBS | DCM | LIQUID/LIQUID SHAKE | GCMS |
| PHENOLS MS | DCM | SOLID PHASE EXTRACTION | GCMS |
| TPH by INFRARED (IR) | TCE | LIQUID/LIQUID SHAKE | HPLC |
| MINERAL OIL by IR | TCE | LIQUID/LIQUID SHAKE | HPLC |
| GLYCOLS | NONE | DIRECT INJECTION | GCMS |

**Identification of Asbestos in Bulk Materials**

**The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).**

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

**Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.**

**The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

Last Updated : 2010/09/08

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150311-22 | **Location:** | Moston Site 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306021 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | 305973 |

# Appendix

## General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

## Sample Deviations

| | |
|---|---|
| 1 | Container with Headspace provided for volatiles analysis |
| 2 | Incorrect container received |
| 3 | Deviation from method |
| 4 | Holding time exceeded before sample received |
| 5 | Samples exceeded holding time before presevation was performed |
| § | Sampled on date not provided |
| ♦ | Sample holding time exceeded in laboratory |
| @ | Sample holding time exceeded due to sampled on date |
| & | Sample Holding Time exceeded - Late arrival of instructions. |

## Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than:
- Trace - Where only one or two asbestos fibres were identified.

**Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.**

**The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

# APPENDIX C
# Moston 5, March 2015
# SDG: 150319-126

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP Environmental
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP

**Attention:** Jess Kinchington

# CERTIFICATE OF ANALYSIS

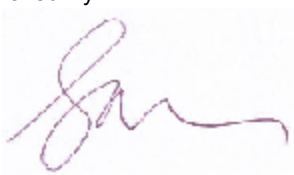
| | |
|---|---|
| **Date:** | 19 March 2015 |
| **Customer:** | H_WSP_MAN |
| **Sample Delivery Group (SDG):** | 150319-126 |
| **Your Reference:** | 70007995 (Moston Site 6) |
| **Location:** | Moston Site 6 |
| **Report No:** | 306026 |

We received 1 sample on Wednesday March 11, 2015 and 1 of these samples were scheduled for analysis which was completed on Thursday March 19, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**
Operations Manager

Alcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 10980497 | Moston 5 TS | ES | 0.00 - 0.00 | 09/03/2015 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

## SOLID

**Results Legend**

X **Test**

N **No Determination Possible**

| | | | Lab Sample No(s) | Customer Sample Reference | AGS Reference | Depth (m) | Container | |
|---|---|---|---|---|---|---|---|---|
| | | | 10980497 | Moston 5 TS | ES | 0.00 - 0.00 | 400g Tub (ALE214) | 60g VOC (ALE215) |
| Asbestos ID in Solid Samples | All | NDPs: 0 Tests: 1 | | | | | X | |
| EPH CWG (Aliphatic) GC (S) | All | NDPs: 0 Tests: 1 | X | | | | | |
| EPH CWG (Aromatic) GC (S) | All | NDPs: 0 Tests: 1 | X | | | | | |
| GRO by GC-FID (S) | All | NDPs: 0 Tests: 1 | | | | | | X |
| Metals in solid samples by OES | All | NDPs: 0 Tests: 1 | X | | | | | |
| PAH by GCMS | All | NDPs: 0 Tests: 1 | X | | | | | |
| pH | All | NDPs: 0 Tests: 1 | | | | | X | |
| Sample description | All | NDPs: 0 Tests: 1 | X | | | | | |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 1 | X | | | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

# Sample Descriptions

## Grain Sizes

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **very fine** | <0.063mm | **fine** | 0.063mm - 0.1mm | **medium** | 0.1mm - 2mm | **coarse** | 2mm - 10mm | **very coarse** | >10mm |

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Grain size | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|---|
| 10980497 | Moston 5 TS | 0.00 - 0.00 | Dark Brown | Silty Clay | 0.063 - 0.1 mm | Stones | Vegetation |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Moston 5 TS |
|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid |
| | | | Date Sampled | 09/03/2015 |
| | | | Sampled Time | - |
| | | | Date Received | 11/03/2015 |
| | | | SDG Ref | 150319-126 |
| | | | Lab Sample No.(s) | 10980497 |
| | | | AGS Reference | ES |
| Moisture Content Ratio (% of as received sample) | % | PM024 | | 18 |
| pH | 1 pH Units | TM133 | | 7.64 M |
| Arsenic | <0.6 mg/kg | TM181 | | 9.97 M |
| Cadmium | <0.02 mg/kg | TM181 | | 0.341 M |
| Chromium | <0.9 mg/kg | TM181 | | 28.2 M |
| Copper | <1.4 mg/kg | TM181 | | 22 M |
| Lead | <0.7 mg/kg | TM181 | | 35.1 M |
| Mercury | <0.14 mg/kg | TM181 | | <0.14 M |
| Nickel | <0.2 mg/kg | TM181 | | 13.7 M |
| Selenium | <1 mg/kg | TM181 | | <1 # |
| Zinc | <1.9 mg/kg | TM181 | | 43.2 M |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

## PAH by GCMS

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Moston 5 TS |
|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid |
| | | | Date Sampled | 09/03/2015 |
| | | | Sampled Time | - |
| | | | Date Received | 11/03/2015 |
| | | | SDG Ref | 150319-126 |
| | | | Lab Sample No.(s) | 10980497 |
| | | | AGS Reference | ES |
| Naphthalene-d8 % recovery** | % | TM218 | | 114 |
| Acenaphthene-d10 % recovery** | % | TM218 | | 115 |
| Phenanthrene-d10 % recovery** | % | TM218 | | 113 |
| Chrysene-d12 % recovery** | % | TM218 | | 109 |
| Perylene-d12 % recovery** | % | TM218 | | 114 |
| Naphthalene | <0.009 mg/kg | TM218 | | 0.039 M |
| Acenaphthylene | <0.012 mg/kg | TM218 | | <0.012 M |
| Acenaphthene | <0.008 mg/kg | TM218 | | 0.0272 M |
| Fluorene | <0.01 mg/kg | TM218 | | 0.0236 M |
| Phenanthrene | <0.015 mg/kg | TM218 | | 0.213 M |
| Anthracene | <0.016 mg/kg | TM218 | | 0.0469 M |
| Fluoranthene | <0.017 mg/kg | TM218 | | 0.279 M |
| Pyrene | <0.015 mg/kg | TM218 | | 0.255 M |
| Benz(a)anthracene | <0.014 mg/kg | TM218 | | 0.134 M |
| Chrysene | <0.01 mg/kg | TM218 | | 0.138 M |
| Benzo(b)fluoranthene | <0.015 mg/kg | TM218 | | 0.184 M |
| Benzo(k)fluoranthene | <0.014 mg/kg | TM218 | | 0.0775 M |
| Benzo(a)pyrene | <0.015 mg/kg | TM218 | | 0.145 M |
| Indeno(1,2,3-cd)pyrene | <0.018 mg/kg | TM218 | | 0.0841 M |
| Dibenzo(a,h)anthracene | <0.023 mg/kg | TM218 | | <0.023 M |
| Benzo(g,h,i)perylene | <0.024 mg/kg | TM218 | | 0.109 M |
| PAH, Total Detected USEPA 16 | <0.118 mg/kg | TM218 | | 1.76 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

## TPH CWG (S)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | Depth (m) | Sample Type | Date Sampled | Sampled Time | Date Received | SDG Ref | Lab Sample No.(s) | AGS Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Moston 5 TS | 0.00 - 0.00 | Soil/Solid | 09/03/2015 | - | 11/03/2015 | 150319-126 | 10980497 | ES |
| GRO Surrogate % recovery** | % | TM089 | 43 | | | | | | | | |
| GRO TOT (Moisture Corrected) | <0.044 mg/kg | TM089 | <0.044 M | | | | | | | | |
| Methyl tertiary butyl ether (MTBE) | <0.005 mg/kg | TM089 | <0.005 M | | | | | | | | |
| Benzene | <0.01 mg/kg | TM089 | <0.01 M | | | | | | | | |
| Toluene | <0.002 mg/kg | TM089 | 0.00366 M | | | | | | | | |
| Ethylbenzene | <0.003 mg/kg | TM089 | <0.003 M | | | | | | | | |
| m,p-Xylene | <0.006 mg/kg | TM089 | <0.006 M | | | | | | | | |
| o-Xylene | <0.003 mg/kg | TM089 | <0.003 M | | | | | | | | |
| sum of detected mpo xylene by GC | <0.009 mg/kg | TM089 | <0.009 | | | | | | | | |
| sum of detected BTEX by GC | <0.024 mg/kg | TM089 | <0.024 | | | | | | | | |
| Aliphatics >C5-C6 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aliphatics >C6-C8 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aliphatics >C8-C10 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aliphatics >C10-C12 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aliphatics >C12-C16 | <0.1 mg/kg | TM173 | <0.1 | | | | | | | | |
| Aliphatics >C16-C21 | <0.1 mg/kg | TM173 | 1.48 | | | | | | | | |
| Aliphatics >C21-C35 | <0.1 mg/kg | TM173 | 29.5 | | | | | | | | |
| Aliphatics >C35-C44 | <0.1 mg/kg | TM173 | 5.21 | | | | | | | | |
| Total Aliphatics >C12-C44 | <0.1 mg/kg | TM173 | 36.2 | | | | | | | | |
| Aromatics >EC5-EC7 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aromatics >EC7-EC8 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aromatics >EC8-EC10 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aromatics >EC10-EC12 | <0.01 mg/kg | TM089 | <0.01 | | | | | | | | |
| Aromatics >EC12-EC16 | <0.1 mg/kg | TM173 | 1.37 | | | | | | | | |
| Aromatics >EC16-EC21 | <0.1 mg/kg | TM173 | 5.59 | | | | | | | | |
| Aromatics >EC21-EC35 | <0.1 mg/kg | TM173 | 56.3 | | | | | | | | |
| Aromatics >EC35-EC44 | <0.1 mg/kg | TM173 | 26.9 | | | | | | | | |
| Aromatics >EC40-EC44 | <0.1 mg/kg | TM173 | 9.47 | | | | | | | | |
| Total Aromatics >EC12-EC44 | <0.1 mg/kg | TM173 | 90.2 | | | | | | | | |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 mg/kg | TM173 | 126 | | | | | | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

## Asbestos Identification - Soil

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Moston 5 TS ES<br>0.00 - 0.00<br>SOLID<br>09/03/2015<br>00:00:00<br>11/03/2015<br>22:18:16<br>150319-126<br>10980497<br>TM048 | 18/03/15 | Chris Swindells | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150319-126 | **Location:** | Moston Site 6 | **Order Number:** | 62001103-S01 |
| **Job:** | H_WSP_MAN-220 | **Customer:** | WSP Environmental | **Report Number:** | 306026 |
| **Client Reference:** | 70007995 (Moston Site 6) | **Attention:** | Jess Kinchington | **Superseded Report:** | |

# Table of Results - Appendix

| Method No | Reference | Description | Wet/Dry Sample [1] | Surrogate Corrected |
|---|---|---|---|---|
| ASB_PREP | | | | |
| PM001 | | Preparation of Samples for Metals Analysis | | |
| PM024 | Modified BS 1377 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material | | |
| TM048 | HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures | Identification of Asbestos in Bulk Material | | |
| TM089 | Modified: US EPA Methods 8020 & 602 | Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12) | | |
| TM133 | BS 1377: Part 3 1990;BS 6068-2.5 | Determination of pH in Soil and Water using the GLpH pH Meter | | |
| TM173 | Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria | Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID | | |
| TM181 | US EPA Method 6010B | Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES | | |
| TM218 | Microwave extraction – EPA method 3546 | Microwave extraction - EPA method 3546 | | |

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

# APPENDIX D
# Moston 6, June 2015
# SDG: 150617-71

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
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email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP Environmental
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP

**Attention:** Paula Gallagher

# CERTIFICATE OF ANALYSIS

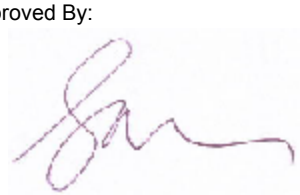
| | |
|---|---|
| **Date:** | 25 June 2015 |
| **Customer:** | H_WSP_MAN |
| **Sample Delivery Group (SDG):** | 150617-71 |
| **Your Reference:** | 70007995 |
| **Location:** | Moston 6 |
| **Report No:** | 318490 |

We received 4 samples on Wednesday June 17, 2015 and 2 of these samples were scheduled for analysis which was completed on Thursday June 25, 2015. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**

Operations Manager

Alcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 11547965 | Plot 87 SS | ES | 0.00 - 0.00 | 15/06/2015 |
| 11547979 | Plot 88 SS | ES | 0.00 - 0.00 | 15/06/2015 |
| 11547959 | Plot 87 TS | D | 0.00 - 0.00 | 15/06/2015 |
| 11547972 | Plot 88 TS | ES | 0.00 - 0.00 | 15/06/2015 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## SOLID

**Results Legend**

X **Test**

N **No Determination Possible**

| | | | Lab Sample No(s) | 11547965 | 11547959 |
|---|---|---|---|---|---|
| | | | Customer Sample Reference | Plot 87 SS | Plot 87 TS |
| | | | AGS Reference | ES | D |
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Container | 250g Amber Jar (AL | 400g Tub (ALE214) | 60g VOC (ALE215) | 250g Amber Jar (AL | 400g Tub (ALE214) | 60g VOC (ALE215) |
| Asbestos ID in Solid Samples | All | NDPs: 0 Tests: 2 | | X | | X | | |
| EPH CWG (Aliphatic) GC (S) | All | NDPs: 0 Tests: 2 | X | | | X | | |
| EPH CWG (Aromatic) GC (S) | All | NDPs: 0 Tests: 2 | X | | | X | | |
| GRO by GC-FID (S) | All | NDPs: 0 Tests: 2 | | | X | | | X |
| Metals in solid samples by OES | All | NDPs: 0 Tests: 2 | X | | | X | | |
| PAH by GCMS | All | NDPs: 0 Tests: 2 | X | | | X | | |
| pH | All | NDPs: 0 Tests: 2 | | X | | | X | |
| Sample description | All | NDPs: 0 Tests: 2 | X | | | X | | |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 2 | X | | | X | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Sample Descriptions

### Grain Sizes

| very fine | <0.063mm | fine | 0.063mm - 0.1mm | medium | 0.1mm - 2mm | coarse | 2mm - 10mm | very coarse | >10mm |
|---|---|---|---|---|---|---|---|---|---|

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Grain size | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|---|
| 11547965 | Plot 87 SS | 0.00 - 0.00 | Dark Brown | Sandy Clay Loam | 0.1 - 2 mm | Stones | Vegetation |
| 11547959 | Plot 87 TS | 0.00 - 0.00 | Dark Brown | Sandy Clay Loam | 0.1 - 2 mm | Stones | Vegetation |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 87 SS | Plot 87 TS |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 15/06/2015 | 15/06/2015 |
| | | | Sampled Time | . | . |
| | | | Date Received | 17/06/2015 | 17/06/2015 |
| | | | SDG Ref | 150617-71 | 150617-71 |
| | | | Lab Sample No.(s) | 11547965 | 11547959 |
| | | | AGS Reference | ES | D |
| Moisture Content Ratio (% of as received sample) | % | PM024 | | 9 | 9.2 |
| pH | 1 pH Units | TM133 | | 7.85 M | 7.9 M |
| Arsenic | <0.6 mg/kg | TM181 | | 7.39 M | 7.4 M |
| Cadmium | <0.02 mg/kg | TM181 | | 0.402 M | 0.289 M |
| Chromium | <0.9 mg/kg | TM181 | | 16.5 M | 17.1 M |
| Copper | <1.4 mg/kg | TM181 | | 19.3 M | 22.2 M |
| Lead | <0.7 mg/kg | TM181 | | 29.7 M | 32 M |
| Mercury | <0.14 mg/kg | TM181 | | <0.14 M | <0.14 M |
| Nickel | <0.2 mg/kg | TM181 | | 20.6 M | 22.7 M |
| Selenium | <1 mg/kg | TM181 | | <1 # | <1 # |
| Zinc | <1.9 mg/kg | TM181 | | 54.6 M | 55.1 M |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## PAH by GCMS

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 87 SS | Plot 87 TS |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 15/06/2015 | 15/06/2015 |
| | | | Sampled Time | . | . |
| | | | Date Received | 17/06/2015 | 17/06/2015 |
| | | | SDG Ref | 150617-71 | 150617-71 |
| | | | Lab Sample No.(s) | 11547965 | 11547959 |
| | | | AGS Reference | ES | D |
| Naphthalene-d8 % recovery** | % | TM218 | | 100 | 101 |
| Acenaphthene-d10 % recovery** | % | TM218 | | 99.7 | 102 |
| Phenanthrene-d10 % recovery** | % | TM218 | | 95.2 | 96.4 |
| Chrysene-d12 % recovery** | % | TM218 | | 101 | 102 |
| Perylene-d12 % recovery** | % | TM218 | | 112 | 115 |
| Naphthalene | <0.009 mg/kg | TM218 | | 0.098 M | 0.0909 M |
| Acenaphthylene | <0.012 mg/kg | TM218 | | 0.0744 M | 0.0666 M |
| Acenaphthene | <0.008 mg/kg | TM218 | | 0.58 M | 0.169 M |
| Fluorene | <0.01 mg/kg | TM218 | | 0.612 M | 0.127 M |
| Phenanthrene | <0.015 mg/kg | TM218 | | 4.29 M | 1.31 M |
| Anthracene | <0.016 mg/kg | TM218 | | 1.46 M | 0.887 M |
| Fluoranthene | <0.017 mg/kg | TM218 | | 5.91 M | 2.7 M |
| Pyrene | <0.015 mg/kg | TM218 | | 4.52 M | 2.42 M |
| Benz(a)anthracene | <0.014 mg/kg | TM218 | | 2.24 M | 1.62 M |
| Chrysene | <0.01 mg/kg | TM218 | | 1.64 M | 1.39 M |
| Benzo(b)fluoranthene | <0.015 mg/kg | TM218 | | 2.3 M | 2.17 M |
| Benzo(k)fluoranthene | <0.014 mg/kg | TM218 | | 0.94 M | 0.735 M |
| Benzo(a)pyrene | <0.015 mg/kg | TM218 | | 1.95 M | 1.72 M |
| Indeno(1,2,3-cd)pyrene | <0.018 mg/kg | TM218 | | 0.85 M | 0.802 M |
| Dibenzo(a,h)anthracene | <0.023 mg/kg | TM218 | | 0.236 M | <0.023 M |
| Benzo(g,h,i)perylene | <0.024 mg/kg | TM218 | | 0.976 M | 0.97 M |
| PAH, Total Detected USEPA 16 | <0.118 mg/kg | TM218 | | 28.7 | 17.2 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## TPH CWG (S)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 87 SS | Plot 87 TS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 | | | | |
| | | | Sample Type | Soil/Solid | Soil/Solid | | | | |
| | | | Date Sampled | 15/06/2015 | 15/06/2015 | | | | |
| | | | Sampled Time | . | . | | | | |
| | | | Date Received | 17/06/2015 | 17/06/2015 | | | | |
| | | | SDG Ref | 150617-71 | 150617-71 | | | | |
| | | | Lab Sample No.(s) | 11547965 | 11547959 | | | | |
| | | | AGS Reference | ES | D | | | | |
| GRO Surrogate % recovery** | % | TM089 | | 52 | 55 | | | | |
| GRO TOT (Moisture Corrected) | <0.044 mg/kg | TM089 | | <0.044 M | <0.044 M | | | | |
| Methyl tertiary butyl ether (MTBE) | <0.005 mg/kg | TM089 | | <0.005 M | <0.005 M | | | | |
| Benzene | <0.01 mg/kg | TM089 | | <0.01 M | <0.01 M | | | | |
| Toluene | <0.002 mg/kg | TM089 | | <0.002 M | <0.002 M | | | | |
| Ethylbenzene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M | | | | |
| m,p-Xylene | <0.006 mg/kg | TM089 | | <0.006 M | <0.006 M | | | | |
| o-Xylene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M | | | | |
| sum of detected mpo xylene by GC | <0.009 mg/kg | TM089 | | <0.009 | <0.009 | | | | |
| sum of detected BTEX by GC | <0.024 mg/kg | TM089 | | <0.024 | <0.024 | | | | |
| Aliphatics >C5-C6 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C6-C8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C8-C10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C10-C12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C12-C16 | <0.1 mg/kg | TM173 | | 3.25 | <0.1 | | | | |
| Aliphatics >C16-C21 | <0.1 mg/kg | TM173 | | 6.79 | <0.1 | | | | |
| Aliphatics >C21-C35 | <0.1 mg/kg | TM173 | | 46 | 20.6 | | | | |
| Aliphatics >C35-C44 | <0.1 mg/kg | TM173 | | 15.1 | 6.53 | | | | |
| Total Aliphatics >C12-C44 | <0.1 mg/kg | TM173 | | 71.1 | 27.1 | | | | |
| Aromatics >EC5-EC7 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC7-EC8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC8-EC10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC10-EC12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC12-EC16 | <0.1 mg/kg | TM173 | | 4.24 | 2.34 | | | | |
| Aromatics >EC16-EC21 | <0.1 mg/kg | TM173 | | 26.8 | 22.3 | | | | |
| Aromatics >EC21-EC35 | <0.1 mg/kg | TM173 | | 72.1 | 98.4 | | | | |
| Aromatics >EC35-EC44 | <0.1 mg/kg | TM173 | | 27.6 | 40.7 | | | | |
| Aromatics >EC40-EC44 | <0.1 mg/kg | TM173 | | 10.9 | 15.7 | | | | |
| Total Aromatics >EC12-EC44 | <0.1 mg/kg | TM173 | | 131 | 164 | | | | |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 mg/kg | TM173 | | 202 | 191 | | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Asbestos Identification - Soil

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 87 SS ES<br>0.00 - 0.00<br>SOLID<br>15/06/2015<br>00:00:00<br>17/06/2015<br>21:49:08<br>150617-71<br>11547965<br>TM048 | 24/6/15 | Rebecca Rawlings | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 87 TS D<br>0.00 - 0.00<br>SOLID<br>15/06/2015<br>00:00:00<br>17/06/2015<br>21:45:03<br>150617-71<br>11547959<br>TM048 | 24/6/15 | Rebecca Rawlings | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Table of Results - Appendix

| Method No | Reference | Description | Wet/Dry Sample [1] | Surrogate Corrected |
|---|---|---|---|---|
| ASB_PREP | | | | |
| PM001 | | Preparation of Samples for Metals Analysis | | |
| PM024 | Modified BS 1377 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material | | |
| TM048 | HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures | Identification of Asbestos in Bulk Material | | |
| TM089 | Modified: US EPA Methods 8020 & 602 | Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12) | | |
| TM133 | BS 1377: Part 3 1990;BS 6068-2.5 | Determination of pH in Soil and Water using the GLpH pH Meter | | |
| TM173 | Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria | Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID | | |
| TM181 | US EPA Method 6010B | Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES | | |
| TM218 | Microwave extraction – EPA method 3546 | Microwave extraction - EPA method 3546 | | |

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 150617-71 | **Location:** | Moston 6 | **Order Number:** | 70007995-S01 |
| **Job:** | H_WSP_MAN-214 | **Customer:** | WSP Environmental | **Report Number:** | 318490 |
| **Client Reference:** | 70007995 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Test Completion Dates

| | | |
|---|---|---|
| **Lab Sample No(s)** | 11547965 | 11547959 |
| **Customer Sample Ref.** | Plot 87 SS | Plot 87 TS |
| **AGS Ref.** | ES | D |
| **Depth** | 0.00 - 0.00 | 0.00 - 0.00 |
| **Type** | SOLID | SOLID |
| Asbestos ID in Solid Samples | 25-Jun-2015 | 25-Jun-2015 |
| EPH CWG (Aliphatic) GC (S) | 19-Jun-2015 | 19-Jun-2015 |
| EPH CWG (Aromatic) GC (S) | 19-Jun-2015 | 19-Jun-2015 |
| GRO by GC-FID (S) | 23-Jun-2015 | 24-Jun-2015 |
| Metals in solid samples by OES | 22-Jun-2015 | 22-Jun-2015 |
| PAH by GCMS | 22-Jun-2015 | 22-Jun-2015 |
| pH | 23-Jun-2015 | 23-Jun-2015 |
| Sample description | 17-Jun-2015 | 17-Jun-2015 |
| TPH CWG GC (S) | 23-Jun-2015 | 24-Jun-2015 |

# APPENDIX E
# Moston 5, January 2016
# SDG: 160128-93

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP Environmental
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP

**Attention:** Paula Gallagher

# CERTIFICATE OF ANALYSIS

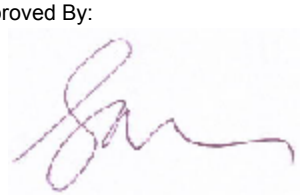
| | |
|---|---|
| **Date:** | 04 February 2016 |
| **Customer:** | H_WSP_MAN |
| **Sample Delivery Group (SDG):** | 160128-93 |
| **Your Reference:** | 70010970-002 |
| **Location:** | Moston Site 5 |
| **Report No:** | 347916 |

We received 2 samples on Thursday January 28, 2016 and 2 of these samples were scheduled for analysis which was completed on Thursday February 04, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**

Operations Manager

Alcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 12829128 | Plot 42 - Subsoil | ES | 0.20 - 0.30 | 26/01/2016 |
| 12829118 | Plot 42 - Topsoil | ES | 0.00 - 0.10 | 26/01/2016 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

**SOLID**

**Results Legend**

X **Test**

N **No Determination Possible**

| | | | Lab Sample No(s) | 12829128 | 12829118 |
|---|---|---|---|---|---|
| | | | Customer Sample Reference | Plot 42 - Subsoil | Plot 42 - Topsoil |
| | | | AGS Reference | ES | ES |
| | | | Depth (m) | 0.20 - 0.30 | 0.00 - 0.10 |
| | | | Container | 1kg TUB / 250g Amber Jar (AL / 60g VOC (ALE215) | 1kg TUB / 250g Amber Jar (AL / 60g VOC (ALE215) |
| Asbestos ID in Solid Samples | All | NDPs: 0 Tests: 2 | | X | X |
| EPH CWG (Aliphatic) GC (S) | All | NDPs: 0 Tests: 2 | | X | X |
| EPH CWG (Aromatic) GC (S) | All | NDPs: 0 Tests: 2 | | X | X |
| GRO by GC-FID (S) | All | NDPs: 0 Tests: 2 | | X | X |
| Metals in solid samples by OES | All | NDPs: 0 Tests: 2 | | X | X |
| PAH by GCMS | All | NDPs: 0 Tests: 2 | | X | X |
| pH | All | NDPs: 0 Tests: 2 | | X | X |
| Sample description | All | NDPs: 0 Tests: 2 | | X | X |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 2 | | X | X |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Sample Descriptions

### Grain Sizes

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **very fine** | <0.063mm | **fine** | 0.063mm - 0.1mm | **medium** | 0.1mm - 2mm | **coarse** | 2mm - 10mm | **very coarse** | >10mm |

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Grain size | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|---|
| 12829128 | Plot 42 - Subsoil | 0.20 - 0.30 | Dark Brown | Sandy Clay Loam | 0.1 - 2 mm | Vegetation | Stones |
| 12829118 | Plot 42 - Topsoil | 0.00 - 0.10 | Dark Brown | Loamy Sand | 0.1 - 2 mm | Vegetation | Stones |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 42 - Subso il | Plot 42 - Topso il |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.20 - 0.30 | 0.00 - 0.10 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 26/01/2016 | 26/01/2016 |
| | | | Sampled Time | . | . |
| | | | Date Received | 28/01/2016 | 28/01/2016 |
| | | | SDG Ref | 160128-93 | 160128-93 |
| | | | Lab Sample No.(s) | 12829128 | 12829118 |
| | | | AGS Reference | ES | ES |
| Moisture Content Ratio (% of as received sample) | % | PM024 | | 27 | 25 |
| pH | 1 pH Units | TM133 | | 7.7 M | 7.59 M |
| Arsenic | <0.6 mg/kg | TM181 | | 9.49 M | 7.87 M |
| Cadmium | <0.02 mg/kg | TM181 | | 0.329 M | 0.214 M |
| Chromium | <0.9 mg/kg | TM181 | | 21.1 M | 9.97 M |
| Copper | <1.4 mg/kg | TM181 | | 23.1 M | 23.4 M |
| Lead | <0.7 mg/kg | TM181 | | 27.3 M | 48.5 M |
| Mercury | <0.14 mg/kg | TM181 | | <0.14 M | <0.14 M |
| Nickel | <0.2 mg/kg | TM181 | | 25.1 M | 9.91 M |
| Selenium | <1 mg/kg | TM181 | | <1 # | <1 # |
| Zinc | <1.9 mg/kg | TM181 | | 69.7 M | 59.2 M |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## PAH by GCMS

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&♦§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 42 - Subso il | Plot 42 - Topso il |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.20 - 0.30 | 0.00 - 0.10 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 26/01/2016 | 26/01/2016 |
| | | | Sampled Time | . | . |
| | | | Date Received | 28/01/2016 | 28/01/2016 |
| | | | SDG Ref | 160128-93 | 160128-93 |
| | | | Lab Sample No.(s) | 12829128 | 12829118 |
| | | | AGS Reference | ES | ES |
| Naphthalene-d8 % recovery** | % | TM218 | | 117 | 108 |
| Acenaphthene-d10 % recovery** | % | TM218 | | 117 | 108 |
| Phenanthrene-d10 % recovery** | % | TM218 | | 113 | 106 |
| Chrysene-d12 % recovery** | % | TM218 | | 107 | 102 |
| Perylene-d12 % recovery** | % | TM218 | | 117 | 113 |
| Naphthalene | <0.009 mg/kg | TM218 | | <0.009 M | <0.009 M |
| Acenaphthylene | <0.012 mg/kg | TM218 | | <0.012 M | <0.012 M |
| Acenaphthene | <0.008 mg/kg | TM218 | | <0.008 M | <0.008 M |
| Fluorene | <0.01 mg/kg | TM218 | | <0.01 M | <0.01 M |
| Phenanthrene | <0.015 mg/kg | TM218 | | 0.226 M | 0.565 M |
| Anthracene | <0.016 mg/kg | TM218 | | 0.234 M | 0.586 M |
| Fluoranthene | <0.017 mg/kg | TM218 | | 0.411 M | 0.946 M |
| Pyrene | <0.015 mg/kg | TM218 | | 0.342 M | 0.887 M |
| Benz(a)anthracene | <0.014 mg/kg | TM218 | | <0.014 M | 0.577 M |
| Chrysene | <0.01 mg/kg | TM218 | | 0.232 M | 0.592 M |
| Benzo(b)fluoranthene | <0.015 mg/kg | TM218 | | 0.385 M | 1.06 M |
| Benzo(k)fluoranthene | <0.014 mg/kg | TM218 | | 0.337 M | 0.927 M |
| Benzo(a)pyrene | <0.015 mg/kg | TM218 | | 0.202 M | 0.585 M |
| Indeno(1,2,3-cd)pyrene | <0.018 mg/kg | TM218 | | 0.107 M | 0.315 M |
| Dibenzo(a,h)anthracene | <0.023 mg/kg | TM218 | | <0.023 M | <0.023 M |
| Benzo(g,h,i)perylene | <0.024 mg/kg | TM218 | | 0.143 M | 0.406 M |
| PAH, Total Detected USEPA 16 | <0.118 mg/kg | TM218 | | 2.62 | 7.45 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## TPH CWG (S)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 42 - Subso il | Plot 42 - Topso il | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | 0.20 - 0.30 | 0.00 - 0.10 | | | |
| | | | Sample Type | Soil/Solid | Soil/Solid | | | |
| | | | Date Sampled | 26/01/2016 | 26/01/2016 | | | |
| | | | Sampled Time | . | . | | | |
| | | | Date Received | 28/01/2016 | 28/01/2016 | | | |
| | | | SDG Ref | 160128-93 | 160128-93 | | | |
| | | | Lab Sample No.(s) | 12829128 | 12829118 | | | |
| | | | AGS Reference | ES | ES | | | |
| GRO Surrogate % recovery** | % | TM089 | | 76 | 46 | | | |
| GRO TOT (Moisture Corrected) | <0.044 mg/kg | TM089 | | <0.044 M | <0.044 M | | | |
| Methyl tertiary butyl ether (MTBE) | <0.005 mg/kg | TM089 | | <0.005 # | <0.005 # | | | |
| Benzene | <0.01 mg/kg | TM089 | | <0.01 M | <0.01 M | | | |
| Toluene | <0.002 mg/kg | TM089 | | 0.0163 M | <0.002 M | | | |
| Ethylbenzene | <0.003 mg/kg | TM089 | | 0.00544 M | <0.003 M | | | |
| m,p-Xylene | <0.006 mg/kg | TM089 | | <0.006 M | <0.006 M | | | |
| o-Xylene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M | | | |
| sum of detected mpo xylene by GC | <0.009 mg/kg | TM089 | | <0.009 | <0.009 | | | |
| sum of detected BTEX by GC | <0.024 mg/kg | TM089 | | <0.024 | <0.024 | | | |
| Aliphatics >C5-C6 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aliphatics >C6-C8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aliphatics >C8-C10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aliphatics >C10-C12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aliphatics >C12-C16 | <0.1 mg/kg | TM173 | | 0.177 | 0.524 | | | |
| Aliphatics >C16-C21 | <0.1 mg/kg | TM173 | | <0.1 | 2.91 | | | |
| Aliphatics >C21-C35 | <0.1 mg/kg | TM173 | | 3.5 | 20.4 | | | |
| Aliphatics >C35-C44 | <0.1 mg/kg | TM173 | | 0.424 | 1.5 | | | |
| Total Aliphatics >C12-C44 | <0.1 mg/kg | TM173 | | 4.1 | 25.3 | | | |
| Aromatics >EC5-EC7 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aromatics >EC7-EC8 | <0.01 mg/kg | TM089 | | 0.0163 | <0.01 | | | |
| Aromatics >EC8-EC10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aromatics >EC10-EC12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | |
| Aromatics >EC12-EC16 | <0.1 mg/kg | TM173 | | 0.239 | 0.845 | | | |
| Aromatics >EC16-EC21 | <0.1 mg/kg | TM173 | | 1.77 | 10.5 | | | |
| Aromatics >EC21-EC35 | <0.1 mg/kg | TM173 | | 25.3 | 91.3 | | | |
| Aromatics >EC35-EC44 | <0.1 mg/kg | TM173 | | 16.3 | 30.8 | | | |
| Aromatics >EC40-EC44 | <0.1 mg/kg | TM173 | | 7.49 | 11.2 | | | |
| Total Aromatics >EC12-EC44 | <0.1 mg/kg | TM173 | | 43.6 | 133 | | | |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 mg/kg | TM173 | | 47.7 | 159 | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Asbestos Identification - Soil

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 42 - Subsoil ES<br>0.20 - 0.30<br>SOLID<br>26/01/2016<br>00:00:00<br>30/01/2016<br>10:58:56<br>160128-93<br>12829128<br>TM048 | 03/02/16 | Chris Swindells | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 42 - Topsoil ES<br>0.00 - 0.10<br>SOLID<br>26/01/2016<br>00:00:00<br>30/01/2016<br>10:53:53<br>160128-93<br>12829118<br>TM048 | 03/02/16 | Chris Swindells | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Table of Results - Appendix

| Method No | Reference | Description | Wet/Dry Sample [1] | Surrogate Corrected |
|---|---|---|---|---|
| ASB_PREP | | | | |
| PM001 | | Preparation of Samples for Metals Analysis | | |
| PM024 | Modified BS 1377 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material | | |
| TM048 | HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures | Identification of Asbestos in Bulk Material | | |
| TM089 | Modified: US EPA Methods 8020 & 602 | Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12) | | |
| TM133 | BS 1377: Part 3 1990;BS 6068-2.5 | Determination of pH in Soil and Water using the GLpH pH Meter | | |
| TM173 | Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria | Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID | | |
| TM181 | US EPA Method 6010B | Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES | | |
| TM218 | Microwave extraction – EPA method 3546 | Microwave extraction - EPA method 3546 | | |

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Test Completion Dates

| **Lab Sample No(s)** | 12829128 | 12829118 |
|---|---|---|
| **Customer Sample Ref.** | Plot 42 - Subsoil | Plot 42 - Topsoil |
| **AGS Ref.** | ES | ES |
| **Depth** | 0.20 - 0.30 | 0.00 - 0.10 |
| **Type** | SOLID | SOLID |
| Asbestos ID in Solid Samples | 03-Feb-2016 | 03-Feb-2016 |
| EPH CWG (Aliphatic) GC (S) | 02-Feb-2016 | 03-Feb-2016 |
| EPH CWG (Aromatic) GC (S) | 02-Feb-2016 | 03-Feb-2016 |
| GRO by GC-FID (S) | 03-Feb-2016 | 03-Feb-2016 |
| Metals in solid samples by OES | 03-Feb-2016 | 03-Feb-2016 |
| PAH by GCMS | 04-Feb-2016 | 04-Feb-2016 |
| pH | 04-Feb-2016 | 04-Feb-2016 |
| Sample description | 30-Jan-2016 | 30-Jan-2016 |
| TPH CWG GC (S) | 03-Feb-2016 | 03-Feb-2016 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

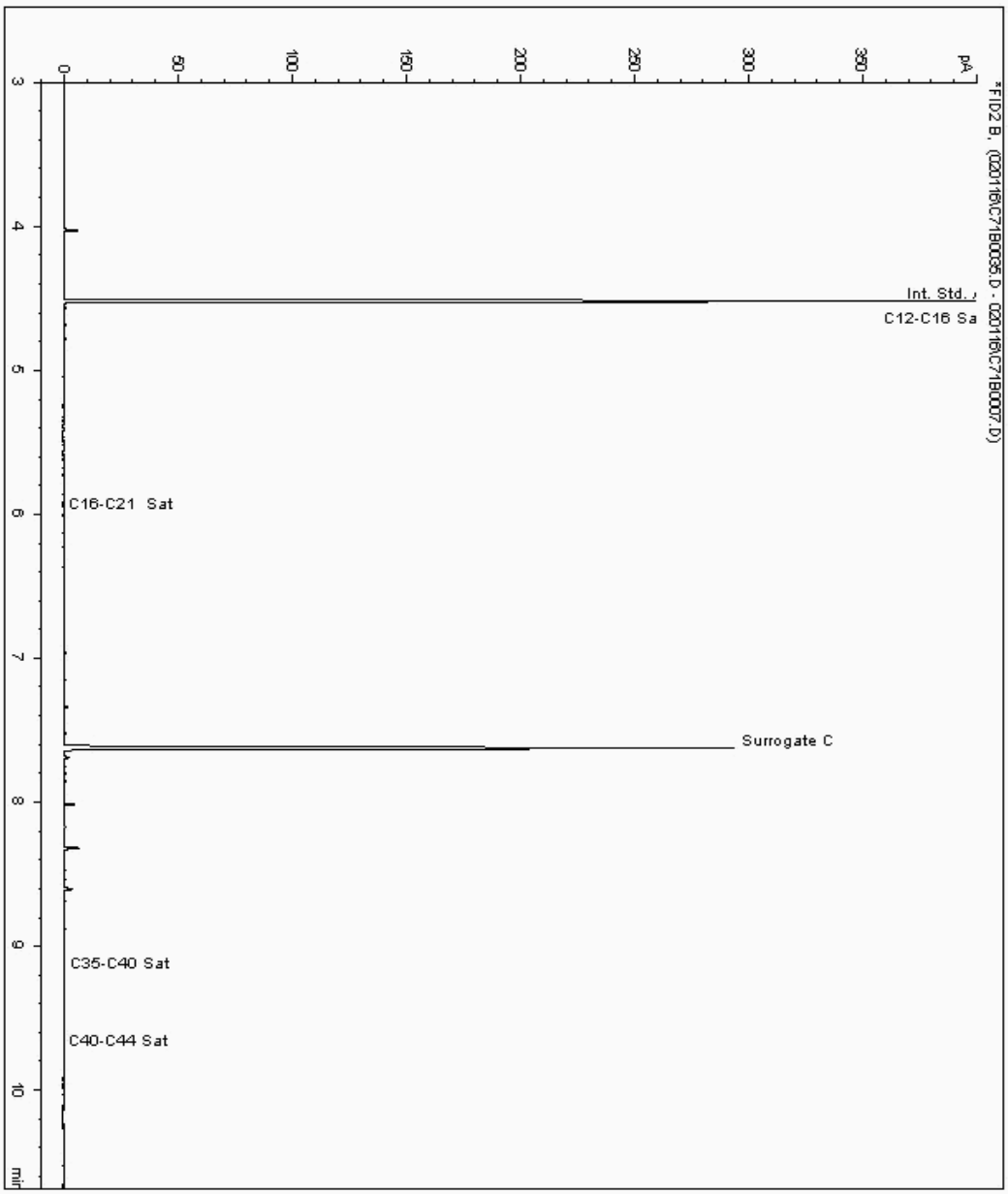
**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 12842453
**Sample ID :** Plot 42 - Subsoil

**Depth :** 0.20 - 0.30

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 12109295-
Date Acquired : 02/02/2016 04:56:14 PM
Units : ppb
Dilution: PLOT 42 - SUBSO[0.20 - 0.30] ->



# CERTIFICATE OF ANALYSIS

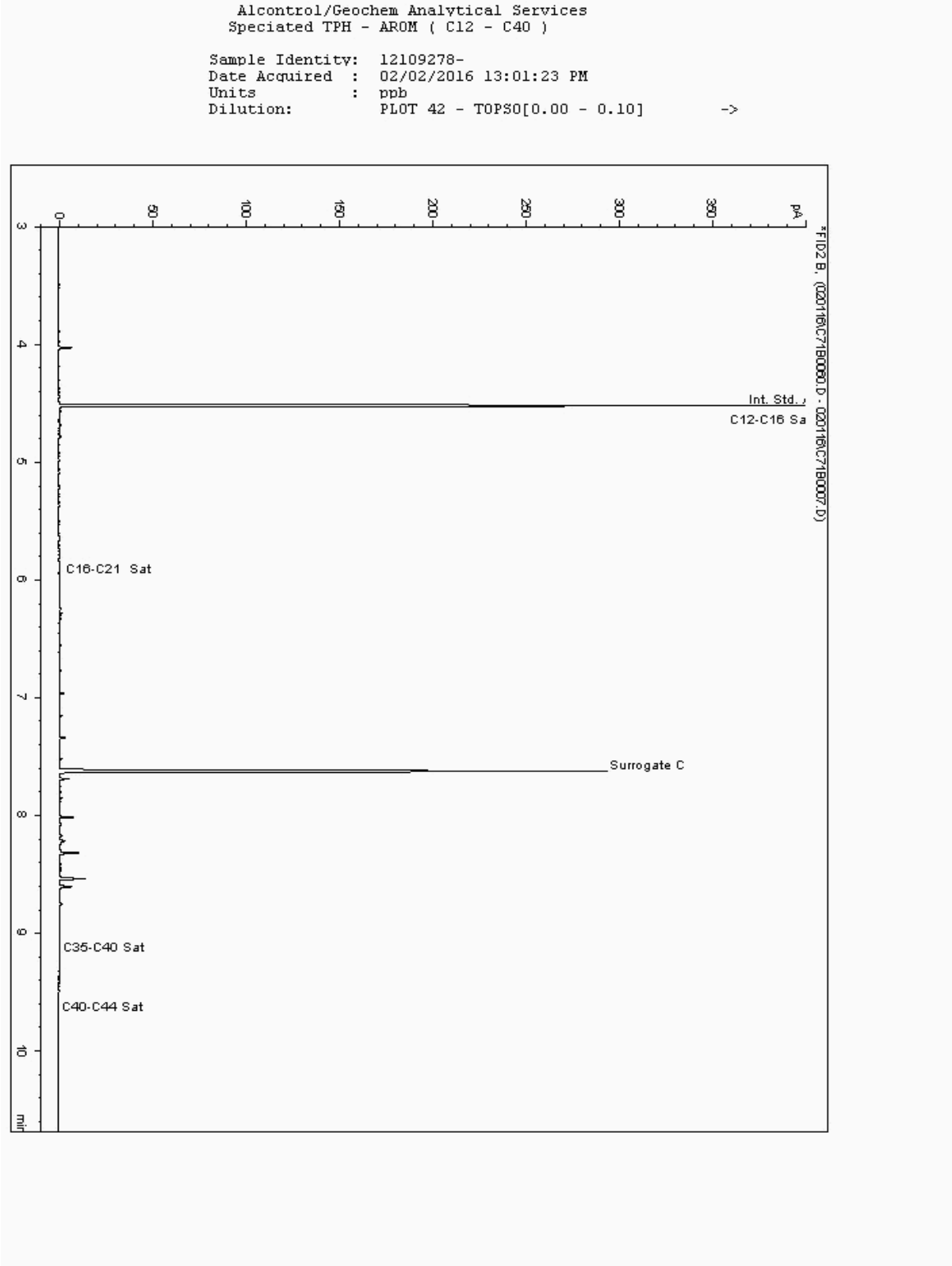
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 12842485
**Sample ID :** Plot 42 - Topsoil

**Depth :** 0.00 - 0.10



# CERTIFICATE OF ANALYSIS

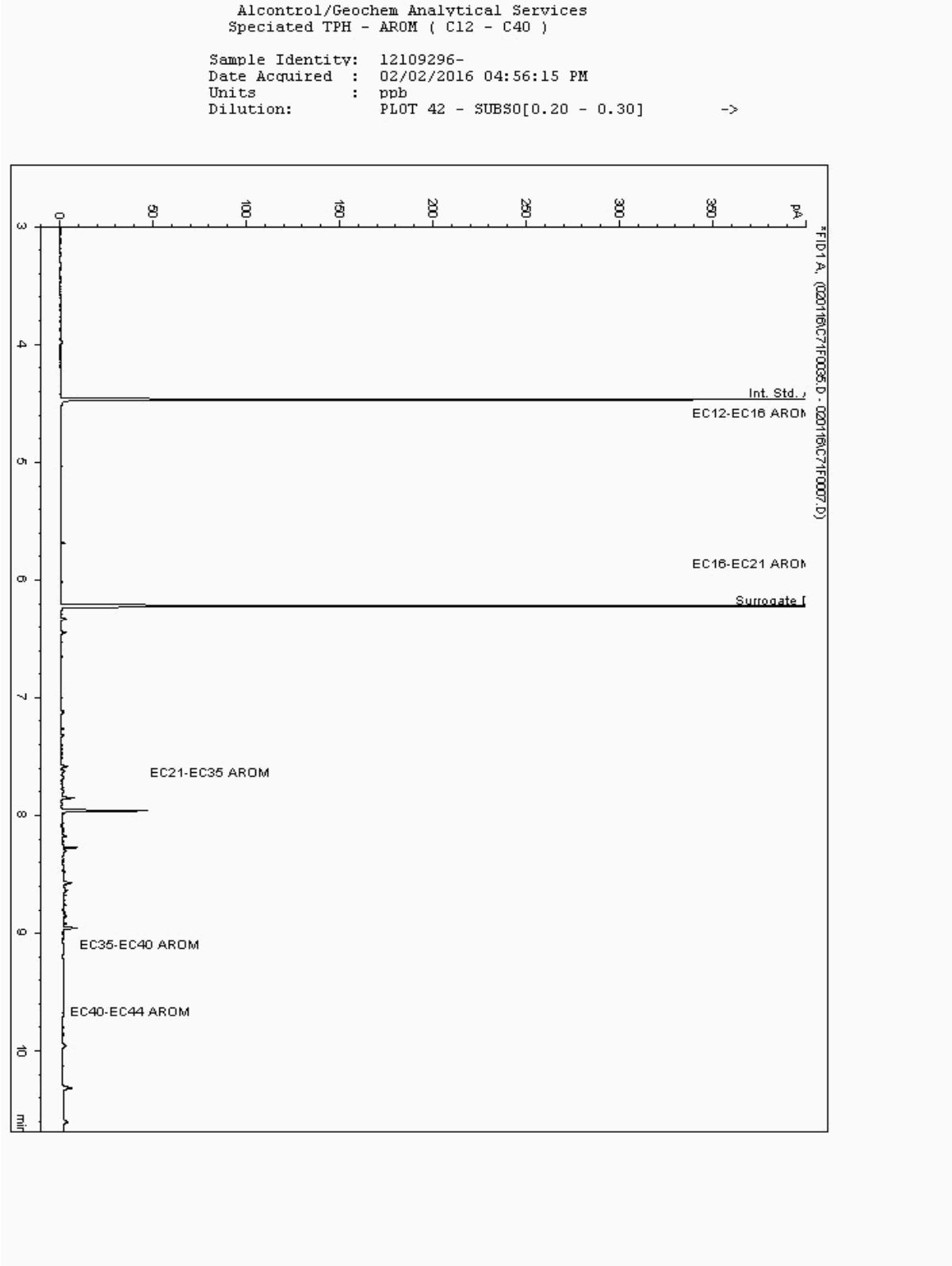
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 12842453
**Sample ID :** Plot 42 - Subsoil

**Depth :** 0.20 - 0.30



# CERTIFICATE OF ANALYSIS

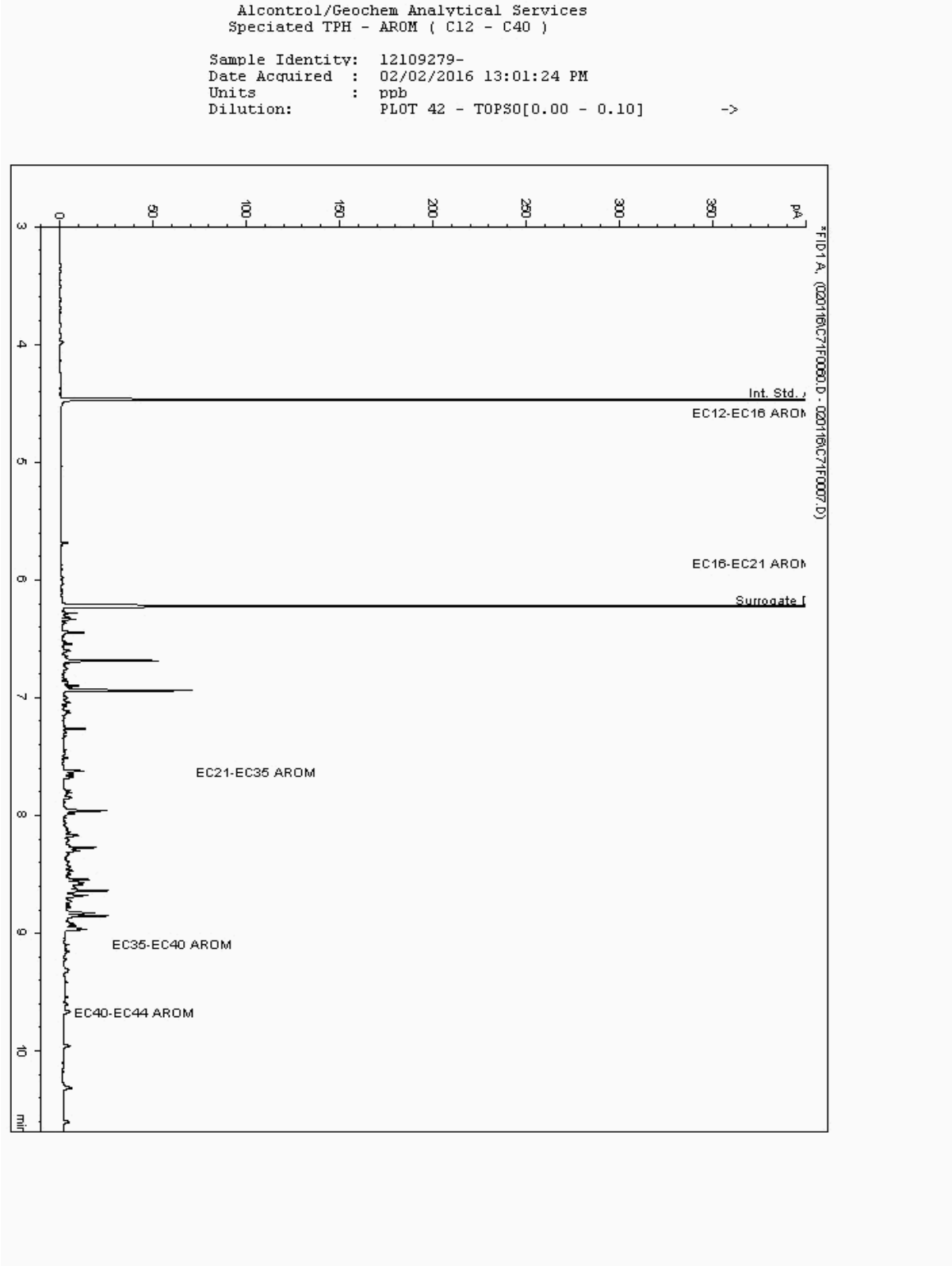
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 12842485
**Sample ID :** Plot 42 - Topsoil

**Depth :** 0.00 - 0.10



# CERTIFICATE OF ANALYSIS

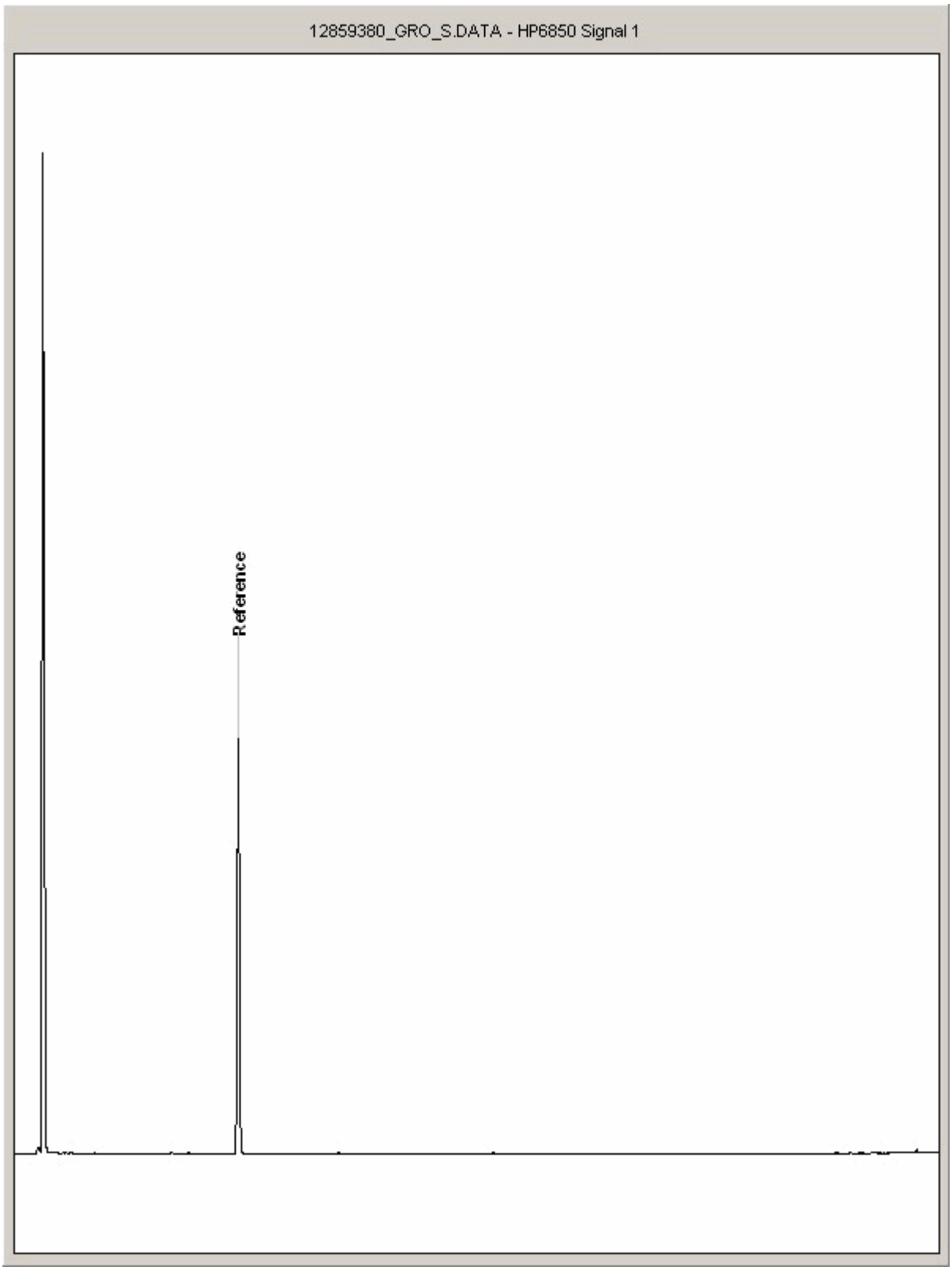
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 12859380
**Sample ID :** Plot 42 - Topsoil

**Depth :** 0.00 - 0.10



# CERTIFICATE OF ANALYSIS

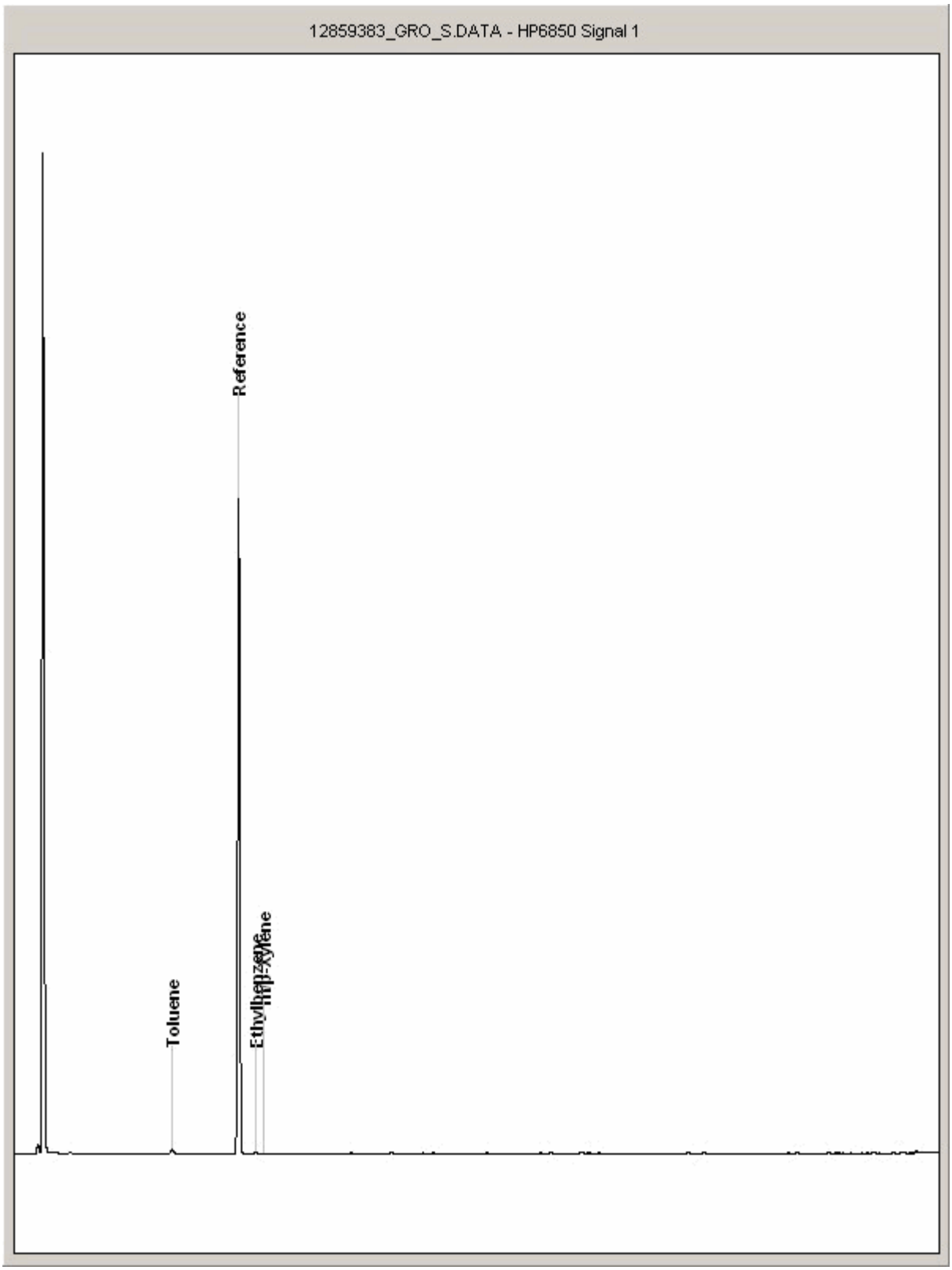
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 12859383
**Sample ID :** Plot 42 - Subsoil

**Depth :** 0.20 - 0.30



# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

# Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

12. Results relate only to the items tested

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not
accredited.

19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

24. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

## SOLID MATRICES EXTRACTION SUMMARY

| ANALYSIS | D/C OR WET | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|---|---|---|---|---|
| SOLVENT EXTRACTABLE MATTER | D&C | DCM | SOXTHERM | GRAVIMETRIC |
| CYCLOHEXANE EXT. MATTER | D&C | CYCLOHEXANE | SOXTHERM | GRAVIMETRIC |
| THIN LAYER CHROMATOGRAPHY | D&C | DCM | SOXTHERM | IATROSCAN |
| ELEMENTAL SULPHUR | D&C | DCM | SOXTHERM | HPLC |
| PHENOLS BY GCMS | WET | DCM | SOXTHERM | GC-MS |
| HERBICIDES | D&C | HEXANE/ACETONE | SOXTHERM | GC-MS |
| PESTICIDES | D&C | HEXANE/ACETONE | SOXTHERM | GC-MS |
| EPH (DRO) | D&C | HEXANE/ACETONE | END OVER END | GC-FID |
| EPH (MIN OIL) | D&C | HEXANE/ACETONE | END OVER END | GC-FID |
| EPH (CLEANED UP) | D&C | HEXANE/ACETONE | END OVER END | GC-FID |
| EPH CWG BY GC | D&C | HEXANE/ACETONE | END OVER END | GC-FID |
| PCB TOT / PCB CON | D&C | HEXANE/ACETONE | END OVER END | GC-MS |
| POLYAROMATIC HYDROCARBONS (MS) | WET | HEXANE/ACETONE | MICROWAVE TM218. | GC-MS |
| C8-C40 (C6-C40) EZ FLASH | WET | HEXANE/ACETONE | SHAKER | GC-EZ |
| POLYAROMATIC HYDROCARBONS RAPID GC | WET | HEXANE/ACETONE | SHAKER | GC-EZ |
| SEMI VOLATILE ORGANIC COMPOUNDS | WET | DCM/ACETONE | SONICATE | GC-MS |

## LIQUID MATRICES EXTRACTION SUMMARY

| ANALYSIS | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|---|---|---|---|
| PAH-MS | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-MS |
| EPH | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-FID |
| EPH CWG | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-FID |
| MINERAL OIL | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-FID |
| PCB 7 CONGENERS | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-MS |
| PCB TOTAL | HEXANE | STIRRED EXTRACTION (STIR-BAR) | GC-MS |
| SVOC | DCM | LIQUID/LIQUID SHAKE | GC-MS |
| FREE SULPHUR | DCM | SOLID PHASE EXTRACTION | HPLC |
| PEST OCP/OPP | DCM | LIQUID/LIQUID SHAKE | GC-MS |
| TRIAZINE HERBS | DCM | LIQUID/LIQUID SHAKE | GC-MS |
| PHENOLS-MS | DCM | SOLID PHASE EXTRACTION | GC-MS |
| TPH by INFRARED (IR) | TCE | LIQUID/LIQUID SHAKE | HPLC |
| MINERAL OIL by IR | TCE | LIQUID/LIQUID SHAKE | HPLC |
| GLYCOLS | NONE | DIRECT INJECTION | GC-MS |

**Identification of Asbestos in Bulk Materials**

**The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).**

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

**Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.**

**The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

Last Updated : 2010/09/08

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160128-93 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP Environmental | **Report Number:** | 347916 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

# Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

# General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

# Sample Deviations

| | |
|---|---|
| 1 | Container with Headspace provided for volatiles analysis |
| 2 | Incorrect container received |
| 3 | Deviation from method |
| 4 | Holding time exceeded before sample received |
| 5 | Samples exceeded holding time before presevation was performed |
| § | Sampled on date not provided |
| ♦ | Sample holding time exceeded in laboratory |
| @ | Sample holding time exceeded due to sampled on date |
| & | Sample Holding Time exceeded - Late arrival of instructions. |

# Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

**Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.**

**The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

# APPENDIX F
# Moston 5, May 2016
# SDG: 160430-55

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP PB MLN
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP

**Attention:** Paula Gallagher

# CERTIFICATE OF ANALYSIS

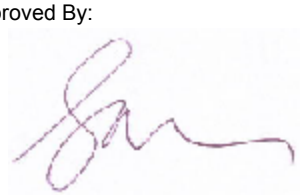
| | |
|---|---|
| **Date:** | 09 May 2016 |
| **Customer:** | H_WSP_MAN |
| **Sample Delivery Group (SDG):** | 160430-55 |
| **Your Reference:** | 70010970-002 |
| **Location:** | Moston Site 5 |
| **Report No:** | 359866 |

We received 2 samples on Saturday April 30, 2016 and 2 of these samples were scheduled for analysis which was completed on Monday May 09, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**

Operations Manager

Alcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 13350439 | Plot 44 | ES | 0.00 - 0.10 | 29/04/2016 |
| 13350445 | Plot 44 | ES | 0.50 - 0.60 | 29/04/2016 |

**Only received samples which have had analysis scheduled will be shown on the following pages.**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

**SOLID**

**Results Legend**

X **Test**

N **No Determination Possible**

| | | | Lab Sample No(s) | 13350439 | 13350445 |
|---|---|---|---|---|---|
| | | | Customer Sample Reference | Plot 44 | Plot 44 |
| | | | AGS Reference | ES | ES |
| | | | Depth (m) | 0.00 - 0.10 | 0.50 - 0.60 |
| | | | Container | 1kg TUB / 250g Amber Jar (AL / 60g VOC (ALE215) | 1kg TUB / 250g Amber Jar (AL / 60g VOC (ALE215) |
| Asbestos ID in Solid Samples | All | NDPs: 0 Tests: 2 | | X | X |
| EPH CWG (Aliphatic) GC (S) | All | NDPs: 0 Tests: 2 | | X | X |
| EPH CWG (Aromatic) GC (S) | All | NDPs: 0 Tests: 2 | | X | X |
| GRO by GC-FID (S) | All | NDPs: 0 Tests: 2 | | X | X |
| Metals in solid samples by OES | All | NDPs: 0 Tests: 2 | | X | X |
| PAH by GCMS | All | NDPs: 0 Tests: 2 | | X | X |
| pH | All | NDPs: 0 Tests: 2 | | X | X |
| Sample description | All | NDPs: 0 Tests: 2 | | X | X |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 2 | | X | X |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Sample Descriptions

### Grain Sizes

| very fine | <0.063mm | fine | 0.063mm - 0.1mm | medium | 0.1mm - 2mm | coarse | 2mm - 10mm | very coarse | >10mm |
|---|---|---|---|---|---|---|---|---|---|

| Lab Sample No(s) | Customer Sample Ref. | Depth (m) | Colour | Description | Grain size | Inclusions | Inclusions 2 |
|---|---|---|---|---|---|---|---|
| 13350439 | Plot 44 | 0.00 - 0.10 | Black | Sandy Clay Loam | 0.063 - 2.00 mm | Stones | Vegetation |
| 13350445 | Plot 44 | 0.50 - 0.60 | Dark Brown | Sandy Clay Loam | 0.063 - 2.00 mm | Stones | None |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 44 | Plot 44 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.10 | 0.50 - 0.60 | | | | |
| | | | Sample Type | Soil/Solid | Soil/Solid | | | | |
| | | | Date Sampled | 29/04/2016 | 29/04/2016 | | | | |
| | | | Sampled Time | . | . | | | | |
| | | | Date Received | 30/04/2016 | 30/04/2016 | | | | |
| | | | SDG Ref | 160430-55 | 160430-55 | | | | |
| | | | Lab Sample No.(s) | 13350439 | 13350445 | | | | |
| | | | AGS Reference | ES | ES | | | | |
| Moisture Content Ratio (% of as received sample) | % | PM024 | | 20 | 21 | | | | |
| pH | 1 pH Units | TM133 | | 7.39 M | 8.04 M | | | | |
| Arsenic | <0.6 mg/kg | TM181 | | 8.12 M | 8.36 M | | | | |
| Cadmium | <0.02 mg/kg | TM181 | | 0.311 M | 0.36 M | | | | |
| Chromium | <0.9 mg/kg | TM181 | | 10.6 M | 14.9 M | | | | |
| Copper | <1.4 mg/kg | TM181 | | 24.1 M | 30.6 M | | | | |
| Lead | <0.7 mg/kg | TM181 | | 71.7 M | 58.2 M | | | | |
| Mercury | <0.14 mg/kg | TM181 | | 0.148 M | <0.14 M | | | | |
| Nickel | <0.2 mg/kg | TM181 | | 11.4 M | 19.8 M | | | | |
| Selenium | <1 mg/kg | TM181 | | <1 # | <1 # | | | | |
| Zinc | <1.9 mg/kg | TM181 | | 73.6 M | 71.4 M | | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## PAH by GCMS

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 44 | Plot 44 |
|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.10 | 0.50 - 0.60 |
| | | | Sample Type | Soil/Solid | Soil/Solid |
| | | | Date Sampled | 29/04/2016 | 29/04/2016 |
| | | | Sampled Time | . | . |
| | | | Date Received | 30/04/2016 | 30/04/2016 |
| | | | SDG Ref | 160430-55 | 160430-55 |
| | | | Lab Sample No.(s) | 13350439 | 13350445 |
| | | | AGS Reference | ES | ES |
| Naphthalene-d8 % recovery** | % | TM218 | | 98.5 | 126 |
| Acenaphthene-d10 % recovery** | % | TM218 | | 95 | 125 |
| Phenanthrene-d10 % recovery** | % | TM218 | | 91.8 | 122 |
| Chrysene-d12 % recovery** | % | TM218 | | 82.4 | 120 |
| Perylene-d12 % recovery** | % | TM218 | | 86.2 | 126 |
| Naphthalene | <0.009 mg/kg | TM218 | | 0.0233 M | 0.0197 M |
| Acenaphthylene | <0.012 mg/kg | TM218 | | <0.012 M | <0.012 M |
| Acenaphthene | <0.008 mg/kg | TM218 | | 0.0231 M | 0.0311 M |
| Fluorene | <0.01 mg/kg | TM218 | | 0.0217 M | 0.0255 M |
| Phenanthrene | <0.015 mg/kg | TM218 | | 0.242 M | 0.254 M |
| Anthracene | <0.016 mg/kg | TM218 | | 0.0481 M | 0.0523 M |
| Fluoranthene | <0.017 mg/kg | TM218 | | 0.402 M | 0.367 M |
| Pyrene | <0.015 mg/kg | TM218 | | 0.375 M | 0.328 M |
| Benz(a)anthracene | <0.014 mg/kg | TM218 | | 0.22 M | 0.206 M |
| Chrysene | <0.01 mg/kg | TM218 | | 0.219 M | 0.176 M |
| Benzo(b)fluoranthene | <0.015 mg/kg | TM218 | | 0.325 M | 0.284 M |
| Benzo(k)fluoranthene | <0.014 mg/kg | TM218 | | 0.12 M | 0.0948 M |
| Benzo(a)pyrene | <0.015 mg/kg | TM218 | | 0.232 M | 0.211 M |
| Indeno(1,2,3-cd)pyrene | <0.018 mg/kg | TM218 | | 0.141 M | 0.122 M |
| Dibenzo(a,h)anthracene | <0.023 mg/kg | TM218 | | 0.0395 M | 0.0378 M |
| Benzo(g,h,i)perylene | <0.024 mg/kg | TM218 | | 0.174 M | 0.146 M |
| PAH, Total Detected USEPA 16 | <0.118 mg/kg | TM218 | | 2.61 | 2.35 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## TPH CWG (S)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | *m*CERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted test. |
| ** | % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery |
| (F) | Trigger breach confirmed |
| 1-5&+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample R | Plot 44 | Plot 44 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.10 | 0.50 - 0.60 | | | | |
| | | | Sample Type | Soil/Solid | Soil/Solid | | | | |
| | | | Date Sampled | 29/04/2016 | 29/04/2016 | | | | |
| | | | Sampled Time | . | . | | | | |
| | | | Date Received | 30/04/2016 | 30/04/2016 | | | | |
| | | | SDG Ref | 160430-55 | 160430-55 | | | | |
| | | | Lab Sample No.(s) | 13350439 | 13350445 | | | | |
| | | | AGS Reference | ES | ES | | | | |
| GRO Surrogate % recovery** | % | TM089 | | 61 | 55 | | | | |
| GRO TOT (Moisture Corrected) | <0.044 mg/kg | TM089 | | <0.044 M | <0.044 M | | | | |
| Methyl tertiary butyl ether (MTBE) | <0.005 mg/kg | TM089 | | <0.005 # | <0.005 # | | | | |
| Benzene | <0.01 mg/kg | TM089 | | <0.01 M | <0.01 M | | | | |
| Toluene | <0.002 mg/kg | TM089 | | <0.002 M | <0.002 M | | | | |
| Ethylbenzene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M | | | | |
| m,p-Xylene | <0.006 mg/kg | TM089 | | <0.006 M | <0.006 M | | | | |
| o-Xylene | <0.003 mg/kg | TM089 | | <0.003 M | <0.003 M | | | | |
| sum of detected mpo xylene by GC | <0.009 mg/kg | TM089 | | <0.009 | <0.009 | | | | |
| sum of detected BTEX by GC | <0.024 mg/kg | TM089 | | <0.024 | <0.024 | | | | |
| Aliphatics >C5-C6 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C6-C8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C8-C10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C10-C12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aliphatics >C12-C16 | <0.1 mg/kg | TM173 | | <0.1 | <0.1 | | | | |
| Aliphatics >C16-C21 | <0.1 mg/kg | TM173 | | <0.1 | 2.57 | | | | |
| Aliphatics >C21-C35 | <0.1 mg/kg | TM173 | | 4.41 | 29.1 | | | | |
| Aliphatics >C35-C44 | <0.1 mg/kg | TM173 | | 0.199 | 9.47 | | | | |
| Total Aliphatics >C12-C44 | <0.1 mg/kg | TM173 | | 4.61 | 41.1 | | | | |
| Aromatics >EC5-EC7 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC7-EC8 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC8-EC10 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC10-EC12 | <0.01 mg/kg | TM089 | | <0.01 | <0.01 | | | | |
| Aromatics >EC12-EC16 | <0.1 mg/kg | TM173 | | <0.1 | 0.372 | | | | |
| Aromatics >EC16-EC21 | <0.1 mg/kg | TM173 | | 2.23 | 4.42 | | | | |
| Aromatics >EC21-EC35 | <0.1 mg/kg | TM173 | | 20.3 | 65.9 | | | | |
| Aromatics >EC35-EC44 | <0.1 mg/kg | TM173 | | 7.78 | 36.8 | | | | |
| Aromatics >EC40-EC44 | <0.1 mg/kg | TM173 | | 2.57 | 14.6 | | | | |
| Total Aromatics >EC12-EC44 | <0.1 mg/kg | TM173 | | 30.3 | 107 | | | | |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 mg/kg | TM173 | | 34.9 | 149 | | | | |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Asbestos Identification - Soil

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 44 ES<br>0.00 - 0.10<br>SOLID<br>29/04/2016<br>00:00:00<br>04/05/2016<br>07:32:53<br>160430-55<br>13350439<br>TM048 | 05/05/16 | Kevin Bowron | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |
| Cust. Sample Ref.<br>Depth (m)<br>Sample Type<br>Date Sampled<br>Date Receieved<br>SDG<br>Original Sample<br>Method Number | Plot 44 ES<br>0.50 - 0.60<br>SOLID<br>29/04/2016<br>00:00:00<br>04/05/2016<br>07:37:26<br>160430-55<br>13350445<br>TM048 | 05/05/16 | Kevin Bowron | - | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Table of Results - Appendix

| Method No | Reference | Description | Wet/Dry Sample [1] | Surrogate Corrected |
|---|---|---|---|---|
| PM001 | | Preparation of Samples for Metals Analysis | | |
| PM024 | Modified BS 1377 | Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material | | |
| TM048 | HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures | Identification of Asbestos in Bulk Material | | |
| TM089 | Modified: US EPA Methods 8020 & 602 | Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12) | | |
| TM133 | BS 1377: Part 3 1990;BS 6068-2.5 | Determination of pH in Soil and Water using the GLpH pH Meter | | |
| TM173 | Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria | Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID | | |
| TM181 | US EPA Method 6010B | Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES | | |
| TM218 | Microwave extraction – EPA method 3546 | Microwave extraction - EPA method 3546 | | |

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Test Completion Dates

| **Lab Sample No(s)** | 13350439 | 13350445 |
|---|---|---|
| **Customer Sample Ref.** | Plot 44 | Plot 44 |
| **AGS Ref.** | ES | ES |
| **Depth** | 0.00 - 0.10 | 0.50 - 0.60 |
| **Type** | SOLID | SOLID |
| Asbestos ID in Solid Samples | 05-May-2016 | 05-May-2016 |
| EPH CWG (Aliphatic) GC (S) | 09-May-2016 | 09-May-2016 |
| EPH CWG (Aromatic) GC (S) | 09-May-2016 | 09-May-2016 |
| GRO by GC-FID (S) | 05-May-2016 | 05-May-2016 |
| Metals in solid samples by OES | 08-May-2016 | 08-May-2016 |
| PAH by GCMS | 06-May-2016 | 06-May-2016 |
| pH | 06-May-2016 | 05-May-2016 |
| Sample description | 04-May-2016 | 04-May-2016 |
| TPH CWG GC (S) | 09-May-2016 | 09-May-2016 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

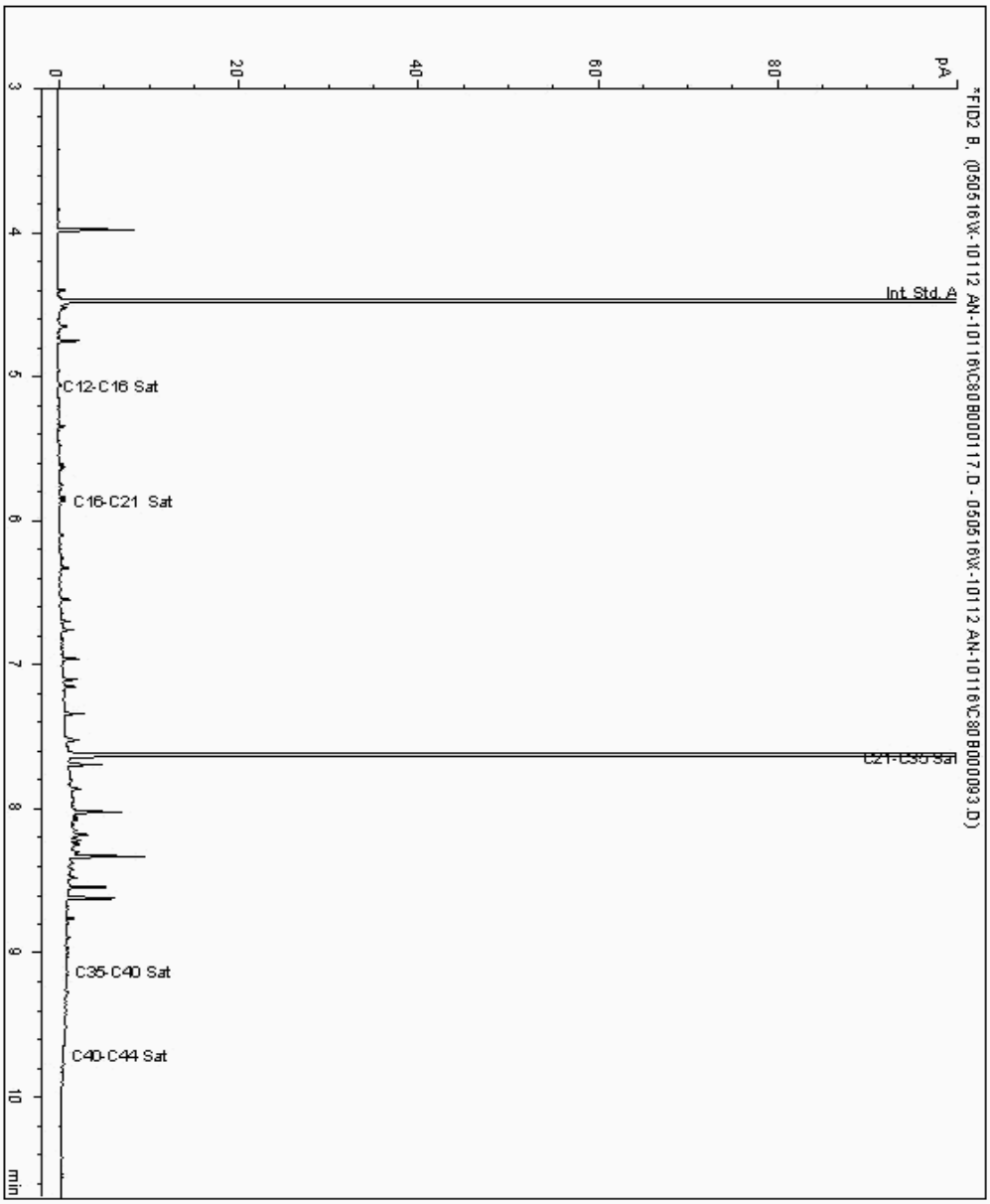
**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 13359586
**Sample ID :** Plot 44

**Depth :** 0.50 - 0.60

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 12570115-
Date Acquired : 06/05/16 19:48:28
Units : ppb
Dilution :
CF : 1
Multiplier : 0.970



# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

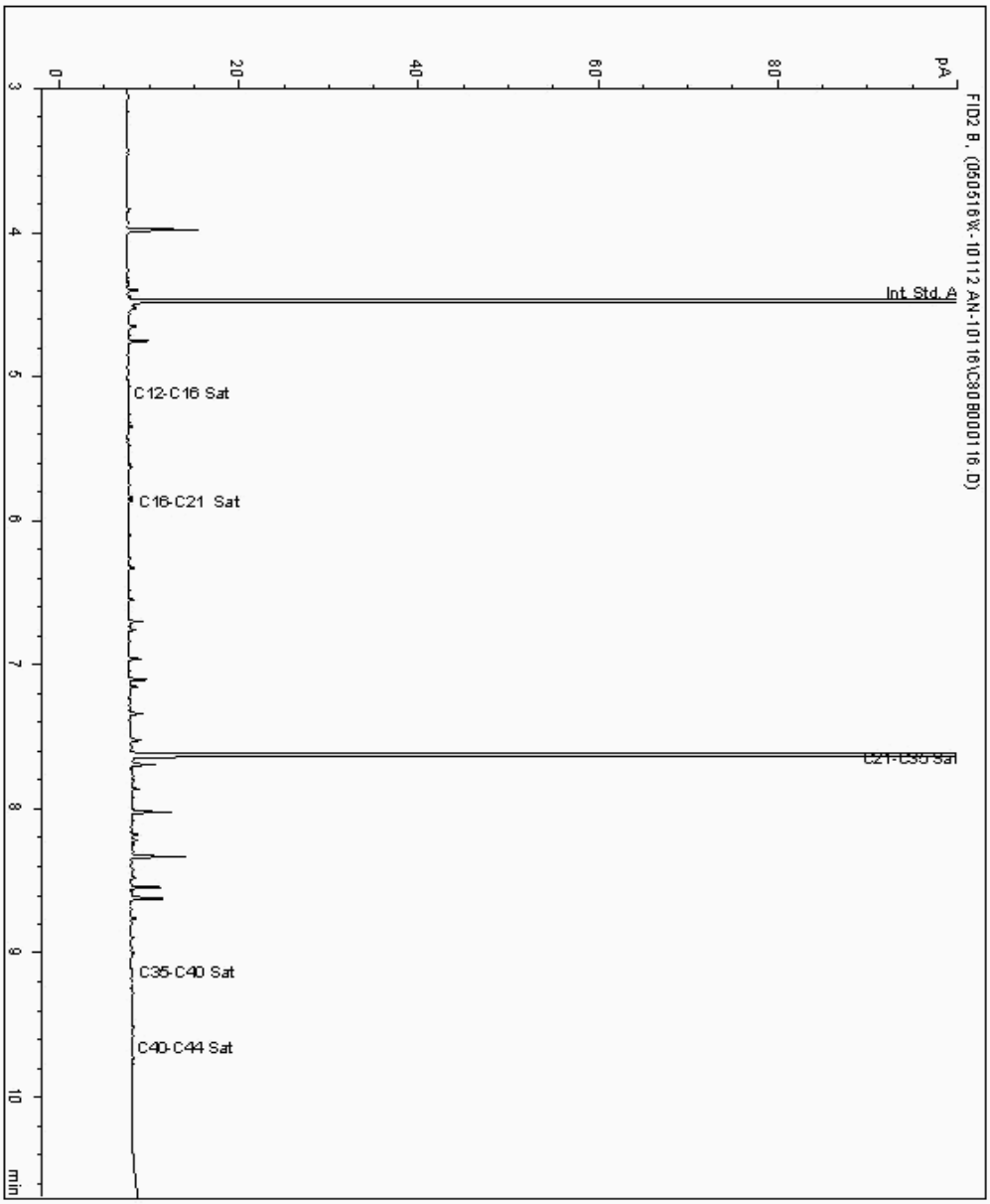
**Analysis:** EPH CWG (Aliphatic) GC (S)

**Sample No :** 13359638
**Sample ID :** Plot 44

**Depth :** 0.00 - 0.10

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 12570086-
Date Acquired : 06/05/16 19:28:05
Units : ppb
Dilution :
CF : 1
Multiplier : 0.960



# CERTIFICATE OF ANALYSIS

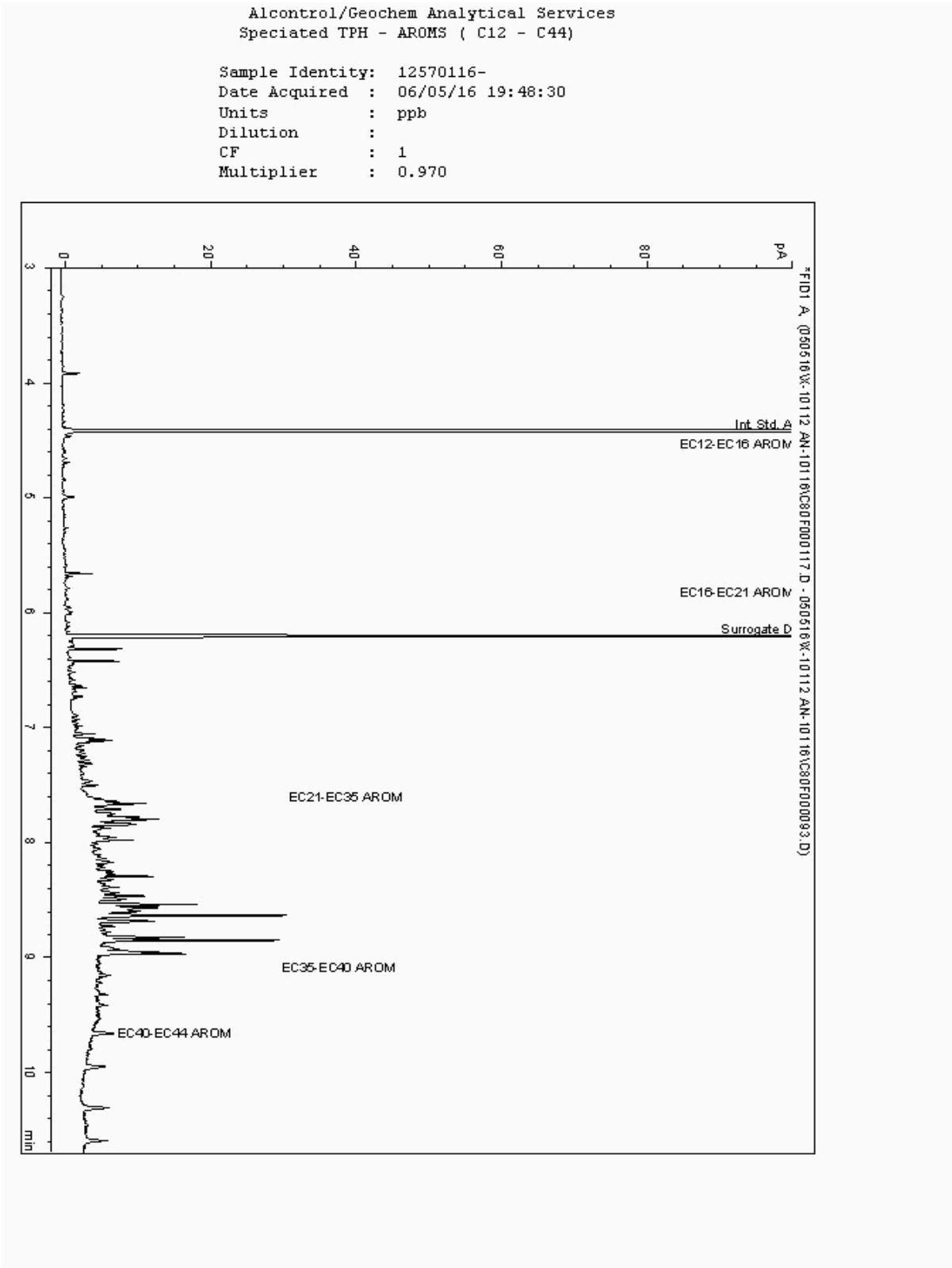
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 13359586
**Sample ID :** Plot 44

**Depth :** 0.50 - 0.60



# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

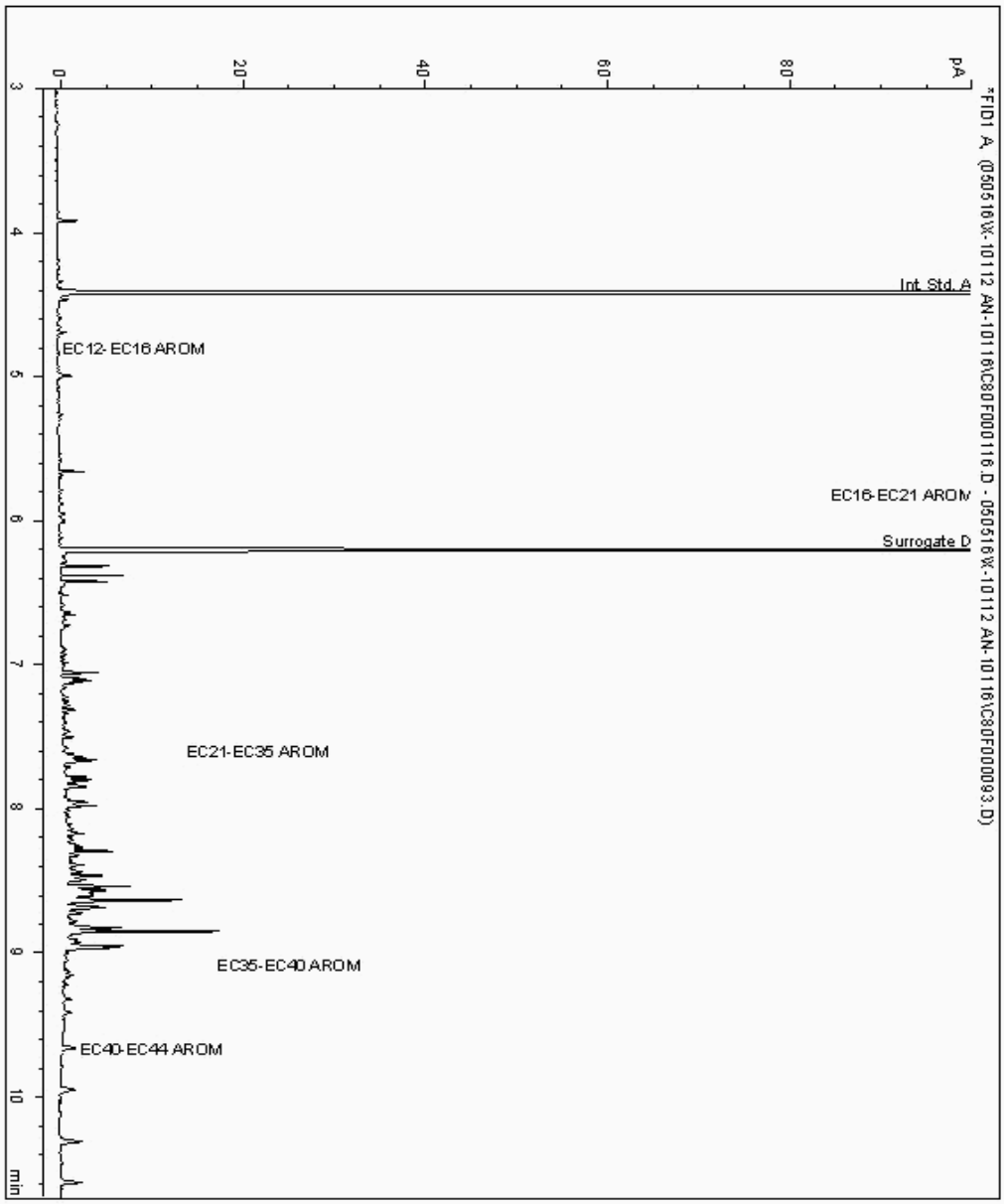
**Analysis:** EPH CWG (Aromatic) GC (S)

**Sample No :** 13359638
**Sample ID :** Plot 44

**Depth :** 0.00 - 0.10

Alcontrol/Geochem Analytical Services
Speciated TPH - AROMS ( C12 - C44)

Sample Identity: 12570087-
Date Acquired : 06/05/16 19:28:07
Units : ppb
Dilution :
CF : 1
Multiplier : 0.960



# CERTIFICATE OF ANALYSIS

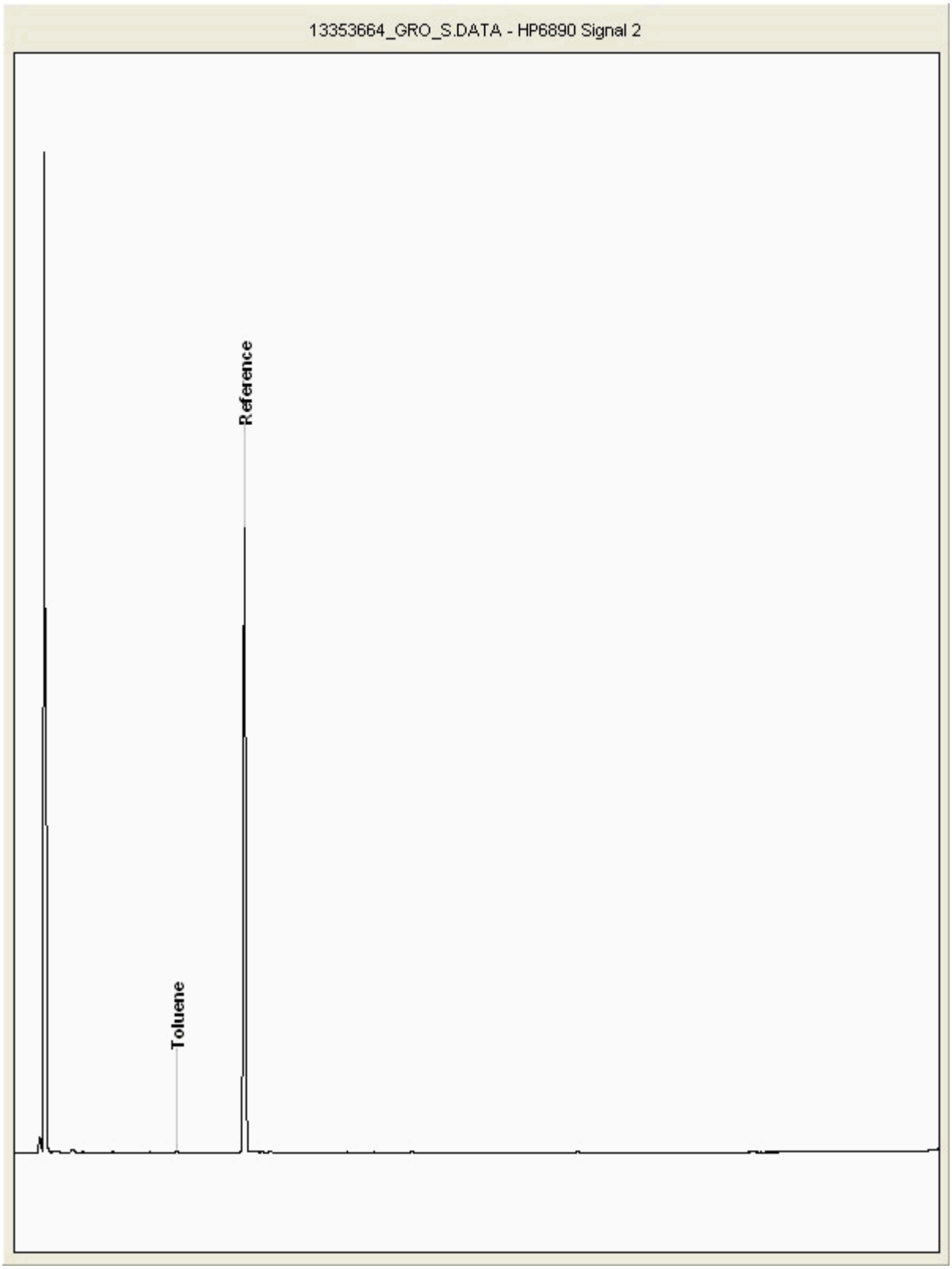
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 13353664
**Sample ID :** Plot 44

**Depth :** 0.50 - 0.60



# CERTIFICATE OF ANALYSIS

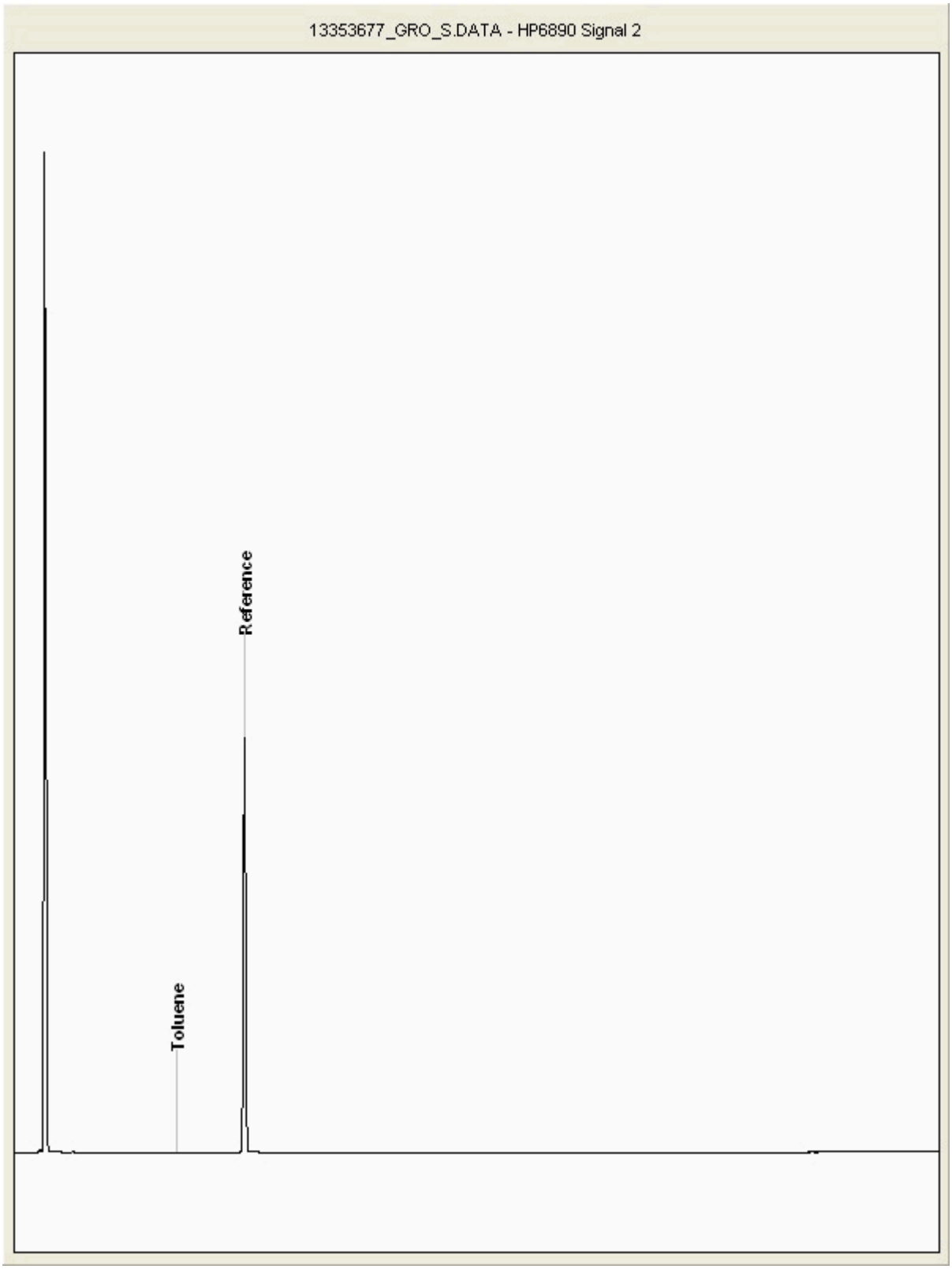
| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

## Chromatogram

**Analysis:** GRO by GC-FID (S)

**Sample No :** 13353677
**Sample ID :** Plot 44

**Depth :** 0.00 - 0.10



| | | | | | |
|---|---|---|---|---|---|
| **SDG:** | 160430-55 | **Location:** | Moston Site 5 | **Order Number:** | 70010970-002 |
| **Job:** | H_WSP_MAN-294 | **Customer:** | WSP PB MLN | **Report Number:** | 359866 |
| **Client Reference:** | 70010970-002 | **Attention:** | Paula Gallagher | **Superseded Report:** | |

# Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

# General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

# Sample Deviations

| | |
|---|---|
| 1 | Container with Headspace provided for volatiles analysis |
| 2 | Incorrect container received |
| 3 | Deviation from method |
| 4 | Holding time exceeded before sample received |
| 5 | Samples exceeded holding time before presevation was performed |
| § | Sampled on date not provided |
| ♦ | Sample holding time exceeded in laboratory |
| @ | Sample holding time exceeded due to sampled on date |
| & | Sample Holding Time exceeded - Late arrival of instructions. |

# Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

| Asbestos Type | Common Name |
|---|---|
| Chrysotile | White Asbestos |
| Amosite | Brown Asbestos |
| Crocidolite | Blue Asbestos |
| Fibrous Actinolite | - |
| Fibrous Anthophyllite | - |
| Fibrous Tremolite | - |

**Visual Estimation Of Fibre Content**

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

**Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.**

**The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**

# APPENDIX G
# Moston 6, June 2016
# SDG: 160521-38

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP PB MLN
The Victoria
150-182 The Quays
Salford
Manchester
Lancashire
M50 3SP
Attention : Jess Kinchington

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Date:** | 07/06/2016 09:28 | | |
| **Customer:** | H_WSP_MAN | | |
| **Sample Delivery Group (SDG):** | 160521-38 | **Report No.:** | 363835 |
| **Your Reference:** | 70007995 (Moston Site 6) | | |
| **Location:** | Moston Site 6 | | |

**This report directly supersedes report 362613 in its entirety.**

We received 3 samples on Saturday May 21, 2016 and 3 of these samples were scheduled for analysis which was then completed on Tuesday June 07, 2016. Accredited laboratory tests are defined in the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with data sections alone.

All chemical testing (unless subcontracting) is performed at ALcontrol Hawarden Laboratories.

Approved By:



**Sonia McWhan**
Operations Manager

Alcontrol Laboratories is a trading division of Alcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291

**SOLID**

| | | | Customer Sample Ref. | Stockpile 1 | Stockpile 2 | Stockpile 3 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 | 0.00 - 0.00 | | | |
| | | | Sample Type | SOLID | SOLID | SOLID | | | |
| | | | Date Sampled | 20/05/2016 | 20/05/2016 | 20/05/2016 | | | |
| | | | Date Received | 21/05/2016 10:52 | 21/05/2016 10:52 | 21/05/2016 10:52 | | | |
| | | | SDG Ref | 160521-38 | 160521-38 | 160521-38 | | | |
| | | | Lab Sample No.(s) | 13469407 | 13469412 | 13469417 | | | |
| | | | AGS Reference | ES | ES | ES | | | |
| Component | LOD | Units | Method | | | | | | |
| **MISC** | | | | | | | | | |
| Moisture Content Ratio (% of as received sample) | | % | PM024 | 8.6 | 11 | 10 | | | |
| Date of Analysis | | - | TM048 | 25/05/2016 | 25/05/2016 | 25/05/2016 | | | |
| Analysed By | | - | TM048 | Rebecca Rawlings | Rebecca Rawlings | Rebecca Rawlings | | | |
| Comments | | - | TM048 | 0 | 0 | 0 | | | |
| Chrysotile (White) Asbestos | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Amosite (Brown) Asbestos | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Crocidolite (Blue) Asbestos | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Fibrous Anthophyllite | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Fibrous Tremolite | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Fibrous Actinolite | | - * | TM048 | Not Detected | Not Detected | Not Detected | | | |
| Non-Asbestos Fibre | | - | TM048 | Not Detected | Not Detected | Not Detected | | | |
| pH | 1 | pH Units M | TM133 | 8.6 | 8.49 | 8.15 | | | |
| Arsenic | <0.6 | mg/kg M | TM181 | 8.05 | 12.6 | 13 | | | |
| Cadmium | <0.02 | mg/kg M | TM181 | 0.425 | 0.591 | 0.525 | | | |
| Chromium | <0.9 | mg/kg M | TM181 | 9.9 | 14.5 | 12.5 | | | |
| Copper | <1.4 | mg/kg M | TM181 | 25 | 32.7 | 50.1 | | | |
| Lead | <0.7 | mg/kg M | TM181 | 60.3 | 83.8 | 105 | | | |
| Mercury | <0.14 | mg/kg M | TM181 | <0.14 | <0.14 | 0.146 | | | |
| Nickel | <0.2 | mg/kg M | TM181 | 12.2 | 20.7 | 16.6 | | | |
| Selenium | <1 | mg/kg * | TM181 | <1 | <1 | <1 | | | |
| Zinc | <1.9 | mg/kg M | TM181 | 66.6 | 96.4 | 90.3 | | | |
| **PAH by GCMS** | | | | | | | | | |
| Naphthalene-d8 % recovery** | | % | TM218 | 95.9 | 96.4 | 102 | | | |
| Acenaphthene-d10 % recovery** | | % | TM218 | 94.8 | 95.4 | 102 | | | |
| Phenanthrene-d10 % recovery** | | % | TM218 | 93.4 | 94.2 | 101 | | | |
| Chrysene-d12 % recovery** | | % | TM218 | 88.7 | 92.4 | 98.8 | | | |
| Perylene-d12 % recovery** | | % | TM218 | 92.5 | 97.6 | 103 | | | |
| Naphthalene | <0.009 | mg/kg M | TM218 | 0.16 | 0.101 | 0.292 | | | |
| Acenaphthylene | <0.012 | mg/kg M | TM218 | 0.0297 | 0.11 | 0.0893 | | | |
| Acenaphthene | <0.008 | mg/kg M | TM218 | 0.344 | 0.173 | 0.296 | | | |
| Fluorene | <0.01 | mg/kg M | TM218 | 0.198 | 0.12 | 0.237 | | | |
| Phenanthrene | <0.015 | mg/kg M | TM218 | 1.77 | 1.63 | 2.5 | | | |
| Anthracene | <0.016 | mg/kg M | TM218 | 0.344 | 0.414 | 0.636 | | | |
| Fluoranthene | <0.017 | mg/kg M | TM218 | 2.49 | 3.97 | 4.54 | | | |
| Pyrene | <0.015 | mg/kg M | TM218 | 2.15 | 3.66 | 4.23 | | | |
| Benz(a)anthracene | <0.014 | mg/kg M | TM218 | 1.17 | 2.17 | 2.42 | | | |
| Chrysene | <0.01 | mg/kg M | TM218 | 1.01 | 1.86 | 1.97 | | | |
| Benzo(b)fluoranthene | <0.015 | mg/kg M | TM218 | 1.11 | 2.18 | 2.39 | | | |
| Benzo(k)fluoranthene | <0.014 | mg/kg M | TM218 | 0.472 | 0.968 | 0.939 | | | |
| Benzo(a)pyrene | <0.015 | mg/kg M | TM218 | 1.17 | 2.49 | 2.44 | | | |
| Indeno(1,2,3-cd)pyrene | <0.018 | mg/kg M | TM218 | 0.569 | 1.29 | 1.19 | | | |
| Dibenzo(a,h)anthracene | <0.023 | mg/kg M | TM218 | 0.168 | 0.371 | 0.353 | | | |
| Benzo(g,h,i)perylene | <0.024 | mg/kg M | TM218 | 0.681 | 1.55 | 1.43 | | | |
| PAH, Total Detected USEPA 16 | <0.118 | mg/kg | TM218 | 13.8 | 23.1 | 26 | | | |
| **TPH CWG (S)** | | | | | | | | | |
| GRO Surrogate % recovery** | | % | TM089 | 70 | 78 | 58 | | | |
| GRO TOT (Moisture Corrected) | <0.044 | mg/kg M | TM089 | <0.044 | 0.0672 | <0.044 | | | |
| Aliphatics >C5-C6 | <0.01 | mg/kg | TM089 | <0.01 | <0.01 | <0.01 | | | |
| Aliphatics >C6-C8 | <0.01 | mg/kg | TM089 | <0.01 | 0.0123 | <0.01 | | | |
| Aliphatics >C8-C10 | <0.01 | mg/kg | TM089 | <0.01 | 0.0157 | <0.01 | | | |
| Aliphatics >C10-C12 | <0.01 | mg/kg | TM089 | <0.01 | 0.0134 | <0.01 | | | |
| Aliphatics >C12-C16 | <0.1 | mg/kg | TM173 | 0.883 | 0.704 | 0.365 | | | |
| Aliphatics >C16-C21 | <0.1 | mg/kg | TM173 | 3.67 | 1.59 | 1.75 | | | |
| Aliphatics >C21-C35 | <0.1 | mg/kg | TM173 | 20.9 | 19.8 | 23.3 | | | |
| Aliphatics >C35-C44 | <0.1 | mg/kg | TM173 | 7.33 | 3.06 | 5.54 | | | |
| Total Aliphatics >C12-C44 | <0.1 | mg/kg | TM173 | 32.8 | 25.2 | 31 | | | |
| Aromatics >EC5-EC7 | <0.01 | mg/kg | TM089 | <0.01 | <0.01 | <0.01 | | | |

**SOLID**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Customer Sample Ref. | Stockpile 1 | Stockpile 2 | Stockpile 3 | | | |
| | | | Depth (m) | 0.00 - 0.00 | 0.00 - 0.00 | 0.00 - 0.00 | | | |
| | | | Sample Type | SOLID | SOLID | SOLID | | | |
| | | | Date Sampled | 20/05/2016 | 20/05/2016 | 20/05/2016 | | | |
| | | | Date Received | 21/05/2016 10:52 | 21/05/2016 10:52 | 21/05/2016 10:52 | | | |
| | | | SDG Ref | 160521-38 | 160521-38 | 160521-38 | | | |
| | | | Lab Sample No.(s) | 13469407 | 13469412 | 13469417 | | | |
| | | | AGS Reference | ES | ES | ES | | | |
| Component | LOD | Units | Method | | | | | | |
| Aromatics >EC7-EC8 | <0.01 | mg/kg | TM089 | <0.01 | <0.01 | <0.01 | | | |
| Aromatics >EC8-EC10 | <0.01 | mg/kg | TM089 | <0.01 | 0.0112 | <0.01 | | | |
| Aromatics >EC10-EC12 | <0.01 | mg/kg | TM089 | <0.01 | <0.01 | <0.01 | | | |
| Aromatics >EC12-EC16 | <0.1 | mg/kg | TM173 | 1.52 | 1.87 | 2.18 | | | |
| Aromatics >EC16-EC21 | <0.1 | mg/kg | TM173 | 11 | 14.1 | 17 | | | |
| Aromatics >EC21-EC35 | <0.1 | mg/kg | TM173 | 57.5 | 69.2 | 74.2 | | | |
| Aromatics >EC35-EC44 | <0.1 | mg/kg | TM173 | 34.3 | 33.3 | 35.9 | | | |
| Aromatics >EC40-EC44 | <0.1 | mg/kg | TM173 | 13.7 | 13.2 | 14 | | | |
| Total Aromatics >EC12-EC44 | <0.1 | mg/kg | TM173 | 104 | 119 | 129 | | | |
| Total Aliphatics & Aromatics >C5-C44 | <0.1 | mg/kg | TM173 | 137 | 144 | 160 | | | |
| Aromatics >EC16-EC35 | <0.1 | mg/kg | TM173 | 68.5 | 83.3 | 91.2 | | | |
| **VOC MS (S)** | | | | | | | | | |
| Methyl Tertiary Butyl Ether | <0.01 | mg/kg M | TM116 | <0.01 | <0.01 | <0.01 | | | |
| Benzene | <0.009 | mg/kg M | TM116 | <0.009 | <0.009 | <0.009 | | | |
| Toluene | <0.007 | mg/kg M | TM116 | <0.007 | <0.007 | <0.007 | | | |
| Ethylbenzene | <0.004 | mg/kg M | TM116 | <0.004 | <0.004 | <0.004 | | | |
| p/m-Xylene | <0.01 | mg/kg * | TM116 | <0.01 | <0.01 | <0.01 | | | |
| o-Xylene | <0.01 | mg/kg M | TM116 | <0.01 | <0.01 | <0.01 | | | |
| Tert-amyl methyl ether | <0.01 | mg/kg * | TM116 | <0.01 | <0.01 | <0.01 | | | |