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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
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Website: www.alsenvironmental.co.uk

Socotec
Geotechnical House
18 - 19 Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

**Attention:** Chris Evans

# CERTIFICATE OF ANALYSIS

| | |
|---|---|
| **Date of report Generation:** | 15 December 2021 |
| **Customer:** | Socotec |
| **Sample Delivery Group (SDG):** | 211125-142 |
| **Your Reference:** | R9072 |
| **Location:** | UPM Shotton |
| **Report No:** | 625895 |
| **Order Number:** | R7744 |

**This report has been revised and directly supersedes 625545 in its entirety.**

We received 2 samples on Thursday November 25, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday December 15, 2021. 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.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|---|---|---|---|---|
| 25405183 | W1 | | | 24/11/2021 |
| 25405184 | W1 | | | 25/11/2021 |

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

Validated

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

**Results Legend**

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

| | | | Lab Sample No(s) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 25405183 | | | | | 25405184 | |
| | | | Customer Sample Reference | | | | | | |
| | | | W1 | | | | | W1 | |
| | | | AGS Reference | | | | | | |
| | | | Depth (m) | | | | | | |
| | | | Container | 250ml BOD (ALE212) | 1000ml glass bottle (ALE220) | 250ml Amber Gl. PTFE/PE (ALE219) | HNO3 Filtered (ALE204) | Vial (ALE297) | |
| | | | Sample Type | TE | TE | TE | TE | TE | |
| 4 - Bromodiphenyl ether (BDE-3)(W)* | All | NDPs: 0 Tests: 1 | | | X | | | | |
| BOD True Total | All | NDPs: 0 Tests: 1 | X | | | | | | |
| Chloralkanes C10 - C13 by GCMS | All | NDPs: 0 Tests: 1 | | | X | | | | |
| Dissolved Metals by ICP-MS | All | NDPs: 0 Tests: 1 | | | | | X | | |
| Mercury Dissolved | All | NDPs: 0 Tests: 1 | | | | | X | | |
| Organotins in Aqueous Samples | All | NDPs: 0 Tests: 1 | | | X | | | | |
| PAH Spec MS - Aqueous (W) | All | NDPs: 0 Tests: 1 | | | | X | | | |
| Pesticides (Suite I) by GCMS | All | NDPs: 0 Tests: 1 | | | X | | | | |
| Pesticides (Suite II) by GCMS | All | NDPs: 0 Tests: 1 | | | X | | | | |
| Pesticides (Suite III) by GCMS | All | NDPs: 0 Tests: 1 | | | X | | | | |
| Phenols and ethoxylates in Liquids | All | NDPs: 0 Tests: 1 | | | X | | | | |
| SVOC MS (W) - Aqueous | All | NDPs: 0 Tests: 1 | | | X | | | | |
| VOC MS (W) | All | NDPs: 0 Tests: 1 | | | | | | X | |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | W1 | W1 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | . | . | | | | |
| | | | Sample Type | Trade Effluent (TE) | Trade Effluent (TE) | | | | |
| | | | Date Sampled | 24/11/2021 | 25/11/2021 | | | | |
| | | | Sample Time | . | . | | | | |
| | | | Date Received | 25/11/2021 | 25/11/2021 | | | | |
| | | | SDG Ref | 211125-142 | 211125-142 | | | | |
| | | | Lab Sample No.(s) | 25405183 | 25405184 | | | | |
| | | | AGS Reference | | | | | | |
| 4 - Bromodiphenyl Ether (BDE-3) | <0.1 µg/l | SUB | | | <0.1 | | | | |
| Chloroalkanes (C10-C13)* | <0.4 µg/l | SUB | | | <0.4 | | | | |
| BOD, unfiltered | <1 mg/l | TM045 | | 1.94 | | | | | |
| Cadmium (diss.filt) | <0.08 µg/l | TM152 | | | <0.08 | | | | |
| Mercury (diss.filt) | <0.01 µg/l | TM183 | | | <0.01 # | | | | |
| Dibutyl tin | <5 ng/l | TM328 | | | <5 | | | | |
| Tributyl tin | <1 ng/l | TM328 | | | <1 | | | | |
| Tetrabutyl tin | <2 ng/l | TM328 | | | <2 | | | | |
| Triphenyl tin | <1 ng/l | TM328 | | | <1 | | | | |
| Surrogate** | % | TM328 | | | 61.8 | | | | |
| Trifluralin | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| alpha-HCH | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| gamma-HCH (Lindane) | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Heptachlor | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Aldrin | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| beta-HCH | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Isodrin | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| delta-HCH | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Heptachlor epoxide | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| o,p'-DDE | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Endosulphan I | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| trans-Chlordane | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| cis-Chlordane | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| p,p'-DDE | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Dieldrin | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| o,p'-DDD (TDE) | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Endrin | <0.01 µg/l | TM343 | | | <0.02 | | | | |
| o,p'-DDT | <0.01 µg/l | TM343 | | | <0.04 | | | | |
| p,p'-DDD (TDE) | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| Endosulphan II | <0.02 µg/l | TM343 | | | <0.02 | | | | |
| p,p'-DDT | <0.01 µg/l | TM343 | | | <0.01 | | | | |
| o,p'-Methoxychlor | <0.01 µg/l | TM343 | | | <0.03 | | | | |
| p,p'-Methoxychlor | <0.01 µg/l | TM343 | | | <0.06 | | | | |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | W1 | W1 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | . | . | | | | |
| | | | Sample Type | Trade Effluent (TE) | Trade Effluent (TE) | | | | |
| | | | Date Sampled | 24/11/2021 | 25/11/2021 | | | | |
| | | | Sample Time | . | . | | | | |
| | | | Date Received | 25/11/2021 | 25/11/2021 | | | | |
| | | | SDG Ref | 211125-142 | 211125-142 | | | | |
| | | | Lab Sample No.(s) | 25405183 | 25405184 | | | | |
| | | | AGS Reference | | | | | | |
| Endosulphan Sulphate | <0.02 µg/l | TM343 | | <0.12 | | | | | |
| Permethrin I | <0.01 µg/l | TM343 | | <0.01 | | | | | |
| Permethrin II | <0.01 µg/l | TM343 | | <0.01 | | | | | |
| 1,3,5-Trichlorobenzene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Hexachlorobutadiene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| 1,2,4-Trichlorobenzene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| 1,2,3-Trichlorobenzene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Dichlorvos | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Dichlobenil | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Mevinphos | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Tecnazene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Hexachlorobenzene | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Demeton-S-methyl | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Phorate | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Diazinon | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Triallate | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Atrazine | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Simazine | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Disulfoton | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Propetamphos | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Chlorpyriphos-methyl | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Dimethoate | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Pirimiphos-methyl | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Chlorpyriphos | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Methyl Parathion | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Malathion | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Fenthion | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Fenitrothion | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Triadimefon | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Pendimethalin | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Parathion | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| Chlorfenvinphos | <0.01 µg/l | TM344 | | <0.01 | | | | | |
| trans-Chlordane | <0.01 µg/l | TM344 | | <0.01 | | | | | |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

| Results Legend | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| # | ISO17025 accredited. | Customer Sample Ref. | W1 | W1 | | | | |
| M | mCERTS accredited. | | | | | | | |
| aq | Aqueous / settled sample. | Depth (m) | . | . | | | | |
| diss.filt | Dissolved / filtered sample. | Sample Type | Trade Effluent (TE) | Trade Effluent (TE) | | | | |
| tot.unfilt | Total / unfiltered sample. | Date Sampled | 24/11/2021 | 25/11/2021 | | | | |
| * | Subcontracted - refer to subcontractor report for accreditation status. | Sample Time | . | . | | | | |
| ** | % 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 | Date Received | 25/11/2021 | 25/11/2021 | | | | |
| | | SDG Ref | 211125-142 | 211125-142 | | | | |
| (F) | Trigger breach confirmed | Lab Sample No.(s) | 25405183 | 25405184 | | | | |
| 1-4+§@ | Sample deviation (see appendix) | AGS Reference | | | | | | |

| Component | LOD/Units | Method | | | | | | |
|---|---|---|---|---|---|---|---|---|
| cis-Chlordane | <0.01 µg/l | TM344 | | <0.01 | | | | |
| Ethion | <0.01 µg/l | TM344 | | <0.01 | | | | |
| Carbophenothion | <0.01 µg/l | TM344 | | <0.01 | | | | |
| Triazophos | <0.01 µg/l | TM344 | | <0.01 | | | | |
| Phosalone | <0.01 µg/l | TM344 | | <0.01 | | | | |
| Azinphos methyl | <0.02 µg/l | TM344 | | <0.02 | | | | |
| Azinphos ethyl | <0.02 µg/l | TM344 | | <0.02 | | | | |
| Etridiazole | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Pentachlorobenzene | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Propachlor | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Quintozene (PCNB) | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Omethoate | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Propazine | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Propyzamide | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Alachlor | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Prometryn | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Telodrin | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Terbutryn | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Chlorothalonil | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Etrimphos | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Metazachlor | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Cyanazine | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Trietazine | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Coumaphos | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Phosphamidon I | <0.01 µg/l | TM345 | | <0.01 | | | | |
| Phosphamidon II | <0.01 µg/l | TM345 | | <0.01 | | | | |
| 4-tert-Octylphenol | <0.014 µg/l | TM426 | | <0.014 | | | | |
| 4-tert-Nonylphenol | <0.04 µg/l | TM426 | | <0.04 | | | | |
| 4-n-Octylphenol | <0.014 µg/l | TM426 | | <0.014 | | | | |
| 4-n-Nonylphenol | <0.04 µg/l | TM426 | | <0.04 | | | | |
| 4-Nonylphenol monoethoxylate | <0.04 µg/l | TM426 | | <0.04 | | | | |
| 4-Nonylphenol diethoxylate | <0.04 µg/l | TM426 | | <0.04 | | | | |
| 4-Octylphenol (sum of isomers) | <0.028 µg/l | TM426 | | <0.028 | | | | |

Validated

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545

**Client Ref.:** R9072 **Location:** UPM Shotton

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| Component | LOD/Units | Method | Customer Sample Ref. | W1 | W1 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Depth (m) | . | . | | | | |
| | | | Sample Type | Trade Effluent (TE) | Trade Effluent (TE) | | | | |
| | | | Date Sampled | 24/11/2021 | 25/11/2021 | | | | |
| | | | Sample Time | . | . | | | | |
| | | | Date Received | 25/11/2021 | 25/11/2021 | | | | |
| | | | SDG Ref | 211125-142 | 211125-142 | | | | |
| | | | Lab Sample No.(s) | 25405183 | 25405184 | | | | |
| | | | AGS Reference | | | | | | |
| 4-Nonylphenol (sum of isomers) | <0.08 µg/l | TM426 | | <0.08 | | | | | |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## PAH Spec MS - Aqueous (W)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| | |
|---|---|
| Customer Sample Ref. | W1 |
| Depth (m) | . |
| Sample Type | Trade Effluent (TE) |
| Date Sampled | 25/11/2021 |
| Sample Time | . |
| Date Received | 25/11/2021 |
| SDG Ref | 211125-142 |
| Lab Sample No.(s) | 25405184 |
| AGS Reference | |

| Component | LOD/Units | Method | |
|---|---|---|---|
| Naphthalene (aq) | <0.01 µg/l | TM178 | <0.01 |
| Acenaphthene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Acenaphthylene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Fluoranthene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Anthracene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Phenanthrene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Fluorene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Chrysene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Pyrene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Benzo(a)anthracene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Benzo(b)fluoranthene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Benzo(k)fluoranthene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Benzo(a)pyrene (aq) | <0.002 µg/l | TM178 | <0.002 |
| Dibenzo(a,h)anthracene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Benzo(g,h,i)perylene (aq) | <0.005 µg/l | TM178 | <0.005 |
| Indeno(1,2,3-cd)pyrene (aq) | <0.005 µg/l | TM178 | <0.005 |
| PAH, Total Detected USEPA 16 (aq) | <0.082 µg/l | TM178 | <0.082 |

Validated

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## SVOC MS (W) - Aqueous

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| | |
|---|---|
| Customer Sample Ref. | W1 |
| Depth (m) | . |
| Sample Type | Trade Effluent (TE) |
| Date Sampled | 25/11/2021 |
| Sample Time | . |
| Date Received | 25/11/2021 |
| SDG Ref | 211125-142 |
| Lab Sample No.(s) | 25405184 |
| AGS Reference | |

| Component | LOD/Units | Method | |
|---|---|---|---|
| 1,2,4-Trichlorobenzene (aq) | <1 µg/l | TM176 | <1 |
| 1,2-Dichlorobenzene (aq) | <1 µg/l | TM176 | <1 |
| 1,3-Dichlorobenzene (aq) | <1 µg/l | TM176 | <1 |
| 1,4-Dichlorobenzene (aq) | <1 µg/l | TM176 | <1 |
| 2,4,5-Trichlorophenol (aq) | <1 µg/l | TM176 | <1 |
| 2,4,6-Trichlorophenol (aq) | <1 µg/l | TM176 | <1 |
| 2,4-Dichlorophenol (aq) | <1 µg/l | TM176 | <1 |
| 2,4-Dimethylphenol (aq) | <1 µg/l | TM176 | <1 |
| 2,4-Dinitrotoluene (aq) | <1 µg/l | TM176 | <1 |
| 2,6-Dinitrotoluene (aq) | <1 µg/l | TM176 | <1 |
| 2-Chloronaphthalene (aq) | <1 µg/l | TM176 | <1 |
| 2-Chlorophenol (aq) | <1 µg/l | TM176 | <1 |
| 2-Methylnaphthalene (aq) | <1 µg/l | TM176 | <1 |
| 2-Methylphenol (aq) | <1 µg/l | TM176 | <1 |
| 2-Nitroaniline (aq) | <1 µg/l | TM176 | <1 |
| 2-Nitrophenol (aq) | <1 µg/l | TM176 | <1 |
| 3-Nitroaniline (aq) | <1 µg/l | TM176 | <1 |
| 4-Bromophenylphenylether (aq) | <1 µg/l | TM176 | <1 |
| 4-Chloro-3-methylphenol (aq) | <1 µg/l | TM176 | <1 |
| 4-Chloroaniline (aq) | <1 µg/l | TM176 | <1 |
| 4-Chlorophenylphenylether (aq) | <1 µg/l | TM176 | <1 |
| 4-Methylphenol (aq) | <1 µg/l | TM176 | <1 |
| 4-Nitroaniline (aq) | <1 µg/l | TM176 | <1 |
| 4-Nitrophenol (aq) | <1 µg/l | TM176 | <1 |
| Azobenzene (aq) | <1 µg/l | TM176 | <1 |
| Acenaphthylene (aq) | <1 µg/l | TM176 | <1 |
| Acenaphthene (aq) | <1 µg/l | TM176 | <1 |
| Anthracene (aq) | <1 µg/l | TM176 | <1 |
| bis(2-Chloroethyl)ether (aq) | <1 µg/l | TM176 | <1 |
| bis(2-Chloroethoxy)methane (aq) | <1 µg/l | TM176 | <1 |
| bis(2-Ethylhexyl) phthalate (aq) | <2 µg/l | TM176 | <2 |
| Butylbenzyl phthalate (aq) | <1 µg/l | TM176 | <1 |
| Benzo(a)anthracene (aq) | <1 µg/l | TM176 | <1 |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## SVOC MS (W) - Aqueous

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| | | | |
|---|---|---|---|
| | Customer Sample Ref. | W1 | |
| | Depth (m) | . | |
| | Sample Type | Trade Effluent (TE) | |
| | Date Sampled | 25/11/2021 | |
| | Sample Time | . | |
| | Date Received | 25/11/2021 | |
| | SDG Ref | 211125-142 | |
| | Lab Sample No.(s) | 25405184 | |
| | AGS Reference | | |

| Component | LOD/Units | Method | | | | | |
|---|---|---|---|---|---|---|---|
| Benzo(b)fluoranthene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Benzo(k)fluoranthene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Benzo(a)pyrene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Benzo(g,h,i)perylene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Carbazole (aq) | <1 µg/l | TM176 | <1 | | | | |
| Chrysene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Dibenzofuran (aq) | <1 µg/l | TM176 | <1 | | | | |
| n-Dibutyl phthalate (aq) | <1 µg/l | TM176 | <1 | | | | |
| Diethyl phthalate (aq) | <1 µg/l | TM176 | <1 | | | | |
| Dibenzo(a,h)anthracene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Dimethyl phthalate (aq) | <1 µg/l | TM176 | <1 | | | | |
| n-Dioctyl phthalate (aq) | <5 µg/l | TM176 | <5 | | | | |
| Fluoranthene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Fluorene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Hexachlorobenzene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Hexachlorobutadiene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Pentachlorophenol (aq) | <1 µg/l | TM176 | <1 | | | | |
| Phenol (aq) | <1 µg/l | TM176 | <1 | | | | |
| n-Nitroso-n-dipropylamine (aq) | <1 µg/l | TM176 | <1 | | | | |
| Hexachloroethane (aq) | <1 µg/l | TM176 | <1 | | | | |
| Nitrobenzene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Naphthalene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Isophorone (aq) | <1 µg/l | TM176 | <1 | | | | |
| Hexachlorocyclopentadiene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Phenanthrene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Indeno(1,2,3-cd)pyrene (aq) | <1 µg/l | TM176 | <1 | | | | |
| Pyrene (aq) | <1 µg/l | TM176 | <1 | | | | |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## VOC MS (W)

**Results Legend**

| | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| | |
|---|---|
| Customer Sample Ref. | W1 |
| Depth (m) | . |
| Sample Type | Trade Effluent (TE) |
| Date Sampled | 25/11/2021 |
| Sample Time | . |
| Date Received | 25/11/2021 |
| SDG Ref | 211125-142 |
| Lab Sample No.(s) | 25405184 |
| AGS Reference | |

| Component | LOD/Units | Method | |
|---|---|---|---|
| Dibromofluoromethane** | % | TM208 | 113 |
| Toluene-d8** | % | TM208 | 97.7 |
| 4-Bromofluorobenzene** | % | TM208 | 97.9 |
| Dichlorodifluoromethane | <1 µg/l | TM208 | <1 # |
| Chloromethane | <1 µg/l | TM208 | <1 # |
| Vinyl chloride | <1 µg/l | TM208 | <1 # |
| Bromomethane | <1 µg/l | TM208 | <1 # |
| Chloroethane | <1 µg/l | TM208 | <1 # |
| Trichlorofluoromethane | <1 µg/l | TM208 | <1 # |
| 1,1-Dichloroethene | <1 µg/l | TM208 | <1 # |
| Carbon disulphide | <1 µg/l | TM208 | <1 # |
| Dichloromethane | <3 µg/l | TM208 | <3 # |
| Methyl tertiary butyl ether (MTBE) | <1 µg/l | TM208 | <1 # |
| trans-1,2-Dichloroethene | <1 µg/l | TM208 | <1 # |
| 1,1-Dichloroethane | <1 µg/l | TM208 | <1 # |
| cis-1,2-Dichloroethene | <1 µg/l | TM208 | <1 # |
| 2,2-Dichloropropane | <1 µg/l | TM208 | <1 |
| Bromochloromethane | <1 µg/l | TM208 | <1 # |
| Chloroform | <1 µg/l | TM208 | <1 # |
| 1,1,1-Trichloroethane | <1 µg/l | TM208 | <1 # |
| 1,1-Dichloropropene | <1 µg/l | TM208 | <1 # |
| Carbontetrachloride | <1 µg/l | TM208 | <1 # |
| 1,2-Dichloroethane | <1 µg/l | TM208 | <1 # |
| Benzene | <1 µg/l | TM208 | <1 # |
| Trichloroethene | <1 µg/l | TM208 | <1 # |
| 1,2-Dichloropropane | <1 µg/l | TM208 | <1 # |
| Dibromomethane | <1 µg/l | TM208 | <1 # |
| Bromodichloromethane | <1 µg/l | TM208 | <1 # |
| cis-1,3-Dichloropropene | <1 µg/l | TM208 | <1 # |
| Toluene | <1 µg/l | TM208 | <1 # |
| trans-1,3-Dichloropropene | <1 µg/l | TM208 | <1 # |
| 1,1,2-Trichloroethane | <1 µg/l | TM208 | <1 # |
| 1,3-Dichloropropane | <1 µg/l | TM208 | <1 # |

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

## VOC MS (W)

| Results Legend | |
|---|---|
| # | ISO17025 accredited. |
| M | mCERTS accredited. |
| aq | Aqueous / settled sample. |
| diss.filt | Dissolved / filtered sample. |
| tot.unfilt | Total / unfiltered sample. |
| * | Subcontracted - refer to subcontractor report for accreditation status. |
| ** | % 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 |
| 1-4+§@ | Sample deviation (see appendix) |

| | |
|---|---|
| Customer Sample Ref. | W1 |
| Depth (m) | . |
| Sample Type | Trade Effluent (TE) |
| Date Sampled | 25/11/2021 |
| Sample Time | . |
| Date Received | 25/11/2021 |
| SDG Ref | 211125-142 |
| Lab Sample No.(s) | 25405184 |
| AGS Reference | |

| Component | LOD/Units | Method | |
|---|---|---|---|
| Tetrachloroethene | <1 µg/l | TM208 | <1 # |
| Dibromochloromethane | <1 µg/l | TM208 | <1 # |
| 1,2-Dibromoethane | <1 µg/l | TM208 | <1 # |
| Chlorobenzene | <1 µg/l | TM208 | <1 # |
| 1,1,1,2-Tetrachloroethane | <1 µg/l | TM208 | <1 # |
| Ethylbenzene | <1 µg/l | TM208 | <1 # |
| m,p-Xylene | <1 µg/l | TM208 | <1 # |
| o-Xylene | <1 µg/l | TM208 | <1 # |
| Styrene | <1 µg/l | TM208 | <1 # |
| Bromoform | <1 µg/l | TM208 | <1 # |
| Isopropylbenzene | <1 µg/l | TM208 | <1 # |
| 1,1,2,2-Tetrachloroethane | <1 µg/l | TM208 | <1 # |
| 1,2,3-Trichloropropane | <1 µg/l | TM208 | <1 # |
| Bromobenzene | <1 µg/l | TM208 | <1 # |
| Propylbenzene | <1 µg/l | TM208 | <1 # |
| 2-Chlorotoluene | <1 µg/l | TM208 | <1 # |
| 1,3,5-Trimethylbenzene | <1 µg/l | TM208 | <1 # |
| 4-Chlorotoluene | <1 µg/l | TM208 | <1 # |
| tert-Butylbenzene | <1 µg/l | TM208 | <1 # |
| 1,2,4-Trimethylbenzene | <1 µg/l | TM208 | <1 # |
| sec-Butylbenzene | <1 µg/l | TM208 | <1 # |
| 4-iso-Propyltoluene | <1 µg/l | TM208 | <1 # |
| 1,3-Dichlorobenzene | <1 µg/l | TM208 | <1 # |
| 1,4-Dichlorobenzene | <1 µg/l | TM208 | <1 # |
| n-Butylbenzene | <1 µg/l | TM208 | <1 # |
| 1,2-Dichlorobenzene | <1 µg/l | TM208 | <1 # |
| 1,2-Dibromo-3-chloropropane | <1 µg/l | TM208 | <1 |
| 1,2,4-Trichlorobenzene | <1 µg/l | TM208 | <1 # |
| Hexachlorobutadiene | <1 µg/l | TM208 | <1 # |
| tert-Amyl methyl ether (TAME) | <1 µg/l | TM208 | <1 # |
| Naphthalene | <1 µg/l | TM208 | <1 # |
| 1,2,3-Trichlorobenzene | <1 µg/l | TM208 | <1 # |
| 1,3,5-Trichlorobenzene | <1 µg/l | TM208 | <1 |

# Table of Results - Appendix

| Method No | Reference | Description |
|---|---|---|
| SUB | | Subcontracted Test |
| TM045 | MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130 | Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids |
| TM152 | Method 3125B, AWWA/APHA, 20th Ed., 1999 | Analysis of Aqueous Samples by ICP-MS |
| TM176 | EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) | Determination of SVOCs in Water by GCMS |
| TM178 | Modified: US EPA Method 8100 | Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters |
| TM183 | BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3 | Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry |
| TM208 | Modified: US EPA Method 8260b & 624 | Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters |
| TM328 | | |
| TM343 | EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) | Determination of Selected Pesticides (Suite I) in Liquids by GCMS |
| TM344 | EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) | Determination of selected pesticides (Suite II) by GCMS |
| TM345 | EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) | Determination of selected pesticides (Suite III) by GCMS |
| TM426 | | Determination of Specific Phenols and their Ethoxylates in Liquids by GC/MS/MS |

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

# CERTIFICATE OF ANALYSIS

**SDG:** 211125-142 **Report Number:** 625895 **Superseded Report:** 625545
**Client Ref.:** R9072 **Location:** UPM Shotton

# Test Completion Dates

| Lab Sample No(s) | 25405183 | 25405184 |
|---|---|---|
| Customer Sample Ref. | W1 | W1 |
| AGS Ref. | | |
| Depth | | |
| Type | Trade Effluent | Trade Effluent |
| 4 - Bromodiphenyl ether (BDE-3)(W)* | | 13-Dec-2021 |
| BOD True Total | 15-Dec-2021 | |
| Chloralkanes C10 - C13 by GCMS | | 08-Dec-2021 |
| Dissolved Metals by ICP-MS | | 02-Dec-2021 |
| Mercury Dissolved | | 30-Nov-2021 |
| Organotins in Aqueous Samples | | 29-Nov-2021 |
| PAH Spec MS - Aqueous (W) | | 30-Nov-2021 |
| Pesticides (Suite I) by GCMS | | 01-Dec-2021 |
| Pesticides (Suite II) by GCMS | | 02-Dec-2021 |
| Pesticides (Suite III) by GCMS | | 02-Dec-2021 |
| Phenols and ethoxylates in Liquids | | 03-Dec-2021 |
| SVOC MS (W) - Aqueous | | 30-Nov-2021 |
| VOC MS (W) | | 02-Dec-2021 |

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **PR21B6772** | Issue Date | : 08-Dec-2021 |
| Customer | : **ALS Life Sciences Ltd** | Laboratory | : ALS Czech Republic, s.r.o. |
| Contact | : ALS Hawarden Reporting | Contact | : Client Service |
| Address | : Unit 7-8 Hawarden Business Park<br>Manor Road, Hawarden<br>CH5 3US Deeside United Kingdom | Address | : Na Harfe 336/9 Prague 9 - Vysocany<br>190 00 Czech Republic |
| E-mail | : euhdnsubconresults@ALSGlobal.com | E-mail | : customer.support@alsglobal.com |
| Telephone | : ---- | Telephone | : +420 226 226 228 |
| Project | : 211125-142 | Page | : 1 of 2 |
| Order number | : ---- | Date Samples Received | : 29-Nov-2021 |
| | | Quote number | : PR2018ALSAL-GB0004 (CZ-256-18-0022) |
| Site | : ---- | Date of test | : 29-Nov-2021 - 08-Dec-2021 |
| Sampled by | : client | QC Level | : ALS CR Standard Quality Control Schedule |

## General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples. If the section "Sampled by" of the Certificate of analysis states: "Sampled by Customer" then the results relate to the sample as received.

## Responsible for accuracy

**Testing Laboratory No. 1163**
**Accredited by CAI according to**
**CSN EN ISO/IEC 17025:2018**

| *Signatories* | | *Position* |
|---|---|---|
| Zdeněk Jirák |  | Environmental Business Unit Manager |

The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)

## *Analytical Results*

| Sub-Matrix: **EFFLUENT** | | | Client sample ID | **25407677 W1** | | ---- | | ---- | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Laboratory sample ID | *PR21B6772001* | | ---- | | ---- | |
| | | | Client sampling date / time | 26-Nov-2021 05:25 | | ---- | | ---- | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Chlorinated Hydrocarbons** | | | | | | | | | |
| **Chlorinated Alkanes C10-C13** | W-CLAGMS01 | 0.40 | µg/L | <0.40 | ---- | **----** | ---- | **----** | ---- |

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

***The end of result part of the certificate of analysis***

## Brief Method Summaries

| *Analytical Methods* | *Method Descriptions* |
|---|---|
| *Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00* | |
| W-CLAGMS01 | CZ_SOP_D06_03_192.A - (CSN EN ISO 12010) Determination of chlorinated alkanes by gas chromatography method with MS/MS detection |

A "*" symbol preceding any method indicates laboratory or subcontractor non-accredited test. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. In the case when a procedure specified in an accredited method was used for non-accredited matrix, the reported results are non-accredited; please refer to information in General Comment section on the front page. If the report contains subcontracted analyses, those are made in a subcontracted laboratory outside the laboratories ALS Czech Republic, s.r.o.
The calculation methods of summation parameters are available on request in the client service.

# Certificate of Analysis

| | |
|---|---|
| **Report No.:** | **21-16464-1** |
| **Issue No.:** | **1** |
| **Date of Issue** | **10/12/2021** |
| Customer Details: | ALS Life Sciences Limited, Unit7-8, Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US |
| Customer Contact: | Lucinda Bowen |
| Customer Order No.: | 211125-142 |
| Customer Reference: | 211125-142 |
| Quotation Reference: | 211028/06 |
| Description: | 1 water sample |
| Date Received: | 29/11/2021 |
| Date Started: | 08/12/2021 |
| Date Completed: | 10/12/2021 |
| Test Methods: | Details available on request (refer to SOP code against relevant result/s) |
| Notes: | None |

**Approved By:** **Matthew Hickson, Laboratory Manager**

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.
This certificate shall not be reproduced except in full without the prior written approval of the laboratory.
Observations and interpretations are outside of the scope of UKAS accreditation.
Results reported herein relate only to the items supplied to the laboratory for testing.
Results on an Interim Report are not dry-weight corrected.
Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.
The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

## Results Summary

**Report No.: 21-16464-1**

Customer Reference: 211125-142

Customer Order No: 211125-142

| | |
|---|---|
| **Customer Sample No** | **25407679** |
| Customer Sample ID | W1 |
| RPS Sample No | 478486 |
| **Sample Type** | **WATER** |
| Sampling Date | 25/11/2021 |

| Determinand | CAS No | Codes | SOP | Units | RL | |
|---|---|---|---|---|---|---|
| 4-bromodiphenyl ether (BDE-3) | 101-55-3 | N | in house | ug/l | 0.1 | < 0.10 |

## Deviating Samples

**Report No.: 21-16464-1**

Customer Reference: 211125-142

Customer Order No: 211125-142

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63).
RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating.
Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised.
Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating.
Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submisson may be required.

| RPS No. | Customer No. | Customer ID | Date Sampled | Containers Received | Deviating | Reason for Deviation |
|---|---|---|---|---|---|---|
| 478486 | 25407679 | | 25/11/2021 | 1 litre green glass bottle | No | |

**Report No.: 21-16464-1**

| Key Code | Description |
|---|---|
| U | UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo |
| F | UKAS Flexible Scope Test |
| M | MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo |
| N | Not Accredited Test |
| O | Marine Management Organisation (MMO) Validated |
| S | Subcontracted to approved laboratory |
| US | Subcontracted to approved laboratory UKAS Accredited for the test |
| MS | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| SI | Subcontracted to internal RPS Group laboratory |
| USI | Subcontracted to internal RPS Group laboratory UKAS Accredited for the test |
| MSI | Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test |
| I/S (in results) | Insufficient Sample |
| U/S (in results) | Unsuitable Sample |
| S/C (in results) | See Comments |
| ND (in results) | Not Detected |
| AD (in units) | Results are expressed on an air-dried basis at 30 °C |
| DW (in units) | Results are expressed on a dry weight basis at 105 °C |

| Sample Type | Sample Retention and Disposal Period |
|---|---|
| Foodstuff | 1 month (if frozen) from the issue date of this report |
| Waters | 2 weeks from the issue date of this report |
| Other Liquids | 1 month from the issue date of this report |
| Solids / Soils | 1 month from the issue date of this report |
| Sediments | 1 month from the issue date of this report |

Note: Sample retention may be subject to agreement with the customer for particular projects

Where the dry solids value of a sample is low (<50%), reporting limits are automatically raised for all determinants analysed on an as-received basis.

| Soil Typing | Description |
|---|---|
| Type 1 | Clay - Brown |
| Type 2 | Clay - Grey/Black |
| Type 3 | Sand |
| Type 4 | Top Soil (Standard) |
| Type 5 | Top Soil (High Peat) |
| Type 6 | Made Ground (>50% Clay) |
| Type 7 | Made Ground (>50% Sand) |
| Type 8 | Made Ground (>50% Top Soil) |
| Type X | Other |

| Certificate Notes | Description |
|---|---|
| Note 1 | This test report shall not be reproduced except in full, without written approval of the Laboratory. |
| Note 2 | Unless otherwise stated, results are not corrected for analytical recoveries. |
| Note 3 | All samples were received in good condition unless otherwise stated. Results provided by the Laboratory are based on samples submitted by clients. Once submitted, samples requiring analysis are stored at 5 ± 3°C. The Laboratory cannot be held responsible for the storage, condition or preservation of samples prior to arrival. |
| Note 4 | Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied. |
| Note 5 | Soil descriptions are given in order to provide a log of sample matrices submitted and are not intended as full geological descriptions. |
| Note 6 | Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. |

Note for results expressed on an air-dried basis: Results for soil samples are reported based on the dry weight of soil which has been air-dried in open, shallow trays at temperatures below 30 °C and subsequently ground and seived to pass through a nominal 710 µm aperture sieve. Prior to any grinding, any material which is retained on a sieve of mesh size 4.75mm is discarded. In most cases, analysis is carried out directly on these prepared soils.

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sample Depth, Sampling Date and Sampling Time. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

# 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. 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. ALS reserve the right to charge for samples received and stored but not analysed.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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%. 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.

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

11. 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.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

14. 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.

15. 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.

16. 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.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

| | |
|---|---|
| 1 | **Container with Headspace provided for volatiles analysis** |
| 2 | **Incorrect container received** |
| 3 | **Deviation from method** |
| 4 | **Matrix interference** |
| ♦ | **Sample holding time exceeded in laboratory** |
| @ | **Sample holding time exceeded due to late arrival of instructions or samples** |
| § | **Sampled on date not provided** |

20. **Asbestos**

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.

**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 ALS (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 ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

| 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.

**Respirable Fibres**

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

**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.**