


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>1291</p> <p>Accredited to ISO/IEC 17025:2017</p>	<h3>ALS Life Sciences Limited</h3> <p>Issue No: 127 Issue date: 20 October 2021</p>	
	<p>Units 7 & 8 Hawarden Business Park Manor Road Off Manor Lane Hawarden Deeside CH5 3US</p>	<p>Contact: Kathleen Burns Tel: +44 (0)1244 528700 Fax: +44 (0)1244 528774 E-Mail: Kathleen.Burns@alsglobal.com Website: www.alsenvironmental.co.uk</p>
<p>Testing performed at the above address only</p>		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ASBESTOS IN BULK MATERIALS	<p><u>Health and Hygiene</u></p> <p>Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite</p>	HSG 248:2005 "Asbestos: The analysts' guide for sampling, analysis and clearance procedures", by Documented In-House Method TM048 using stereo-microscopy, polarised light microscopy and dispersion staining
ASBESTOS IN SOILS and AGGREGATES (fibre screening, identification)	<p>Asbestos fibre screening, identification of asbestos content: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite</p>	Documented In-House Method TM 048 using stereo microscopy, polarised light optical microscopy, phase contrast microscopy and dispersion staining
ASBESTOS IN SOILS (fibre screening, identification and quantification)	<p>Asbestos fibre screening, identification and quantification of asbestos content: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite</p>	Documented In-House Method TM 048 and TM 304 using stereo microscopy, polarised light optical microscopy, phase contrast microscopy and dispersion staining
ASBESTOS IN SOILS (Dustiness)	<p>Measurement of Dustiness</p>	Documented In-House Method TM 419 based on BS EN15051-2:2013 +1:2016 "Measurement of the dustiness Of bulk materials; Part 2: Rotating drum method"



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<p>NATURAL GAS</p> <p>AMBIENT AIR</p>	<p><u>Chemical Tests</u></p> <p>Monoethylene Glycol (MEG) in distributed Natural Gas</p> <p>Volatile Organic Compounds,</p> <p>1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,2,3-Trimethylbenzene 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,2-Dibromoethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloropropane 1,2-Dichlorotetrafluoroethane 1,3,5-Trimethylbenzene 1,3-Butadiene 1,4-Dichlorobenzene 1-Propanol 2-Butanone (MEK) 2-Hexanone 2-Pentanone 3-Hexanone 3-Pentanone 4-Methyl-2-pentanone Acetone + Propanal Acetonitrile Acrolein Benzene Benzyl Chloride Bromodichloromethane Bromoform</p>	<p>Documented In-House Methods in the series TM 000</p> <p>TM 121 by Thermal desorption and GC-FID</p> <p>TM 330 based upon US EPA TO-15</p>



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<p>AMBIENT AIR (cont'd)</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Organic Compounds (cont'd), specifically:</p> <p>Bromomethane Butanal Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane cis-1,2-Dichloroethene cis-1,3-Dichloropropene Cyclohexane Dichlorodifluoromethane Difluorochloromethane Ethylbenzene Hexanal Hexane Iodomethane Isobutene Isoprene m/p-Xylene Methylacrolein Methylene Chloride MTBE o-Xylene Pentanal Pentane Styrene Tetrachloroethene Toluene trans-1,2-Dichloroethene trans-1,3-Dichloropropene Trichloroethene Trichlorofluoromethane Trichlorotrifluoroethane Vinyl Acetate Vinyl Chloride</p>	<p>Documented In-House Methods in the series TM 000</p> <p>TM 330 based upon US EPA TO-15 by GC-MS</p>



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SOILS	<u>Chemical Tests</u> Exchangeable Ammonium Exchangeable Magnesium Exchangeable Potassium Water Soluble Anions (2:1), specifically: Chloride Bromide Nitrate Sulphate Water soluble Anions (2:1), specifically: Chloride Sulphate Total Cyanide Easily Liberated/Free Cyanide Thiocyanate Extractable Phosphorus (Olsen's Phosphorus)	TM 024 by steam distillation and titration TM 244 by ICP-OES based on BS 3882:2015 TM 019 by Ion Chromatography (IC) TM 243 by Kone analyser TM 153 by segmented flow analyser based on AWWA/APHA 20 th Edition - Method 4500 TM 229 by Kone analyser based upon The Analysis of Agricultural Materials, MAFF, Third edition, 1986
SOILS and SEWAGE SLUDGE	Hexavalent Chromium	TM 151 by Kone analyser
SOILS and SLUDGE	Acid Extractable Fluoride	TM397 by ion selective electrode
	Dry Matter at 105°C Total Ash at 550°C	Documented In-House Method TM 236 The Determination of the Dry Solids residue at 105°C and The Total Ash after ignition at 550°C
Sludge	Alkalinity (liquid fraction)	TM 043 by auto-titrator
	pH	TM 133 using a GL pH Meter
	Total Organic Carbon (TOC)	TM 132 by combustion method (ELTRA CS800)



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SOILS (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p><u>Metals:</u> Antimony Arsenic Barium Beryllium Boron Cadmium Cobalt Chromium Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Strontium Thallium Tin Vanadium Zinc</p> <p>Water Soluble Boron (10:1)</p> <p>Loss on ignition</p> <p>Acid Extractable Sulphate</p> <p>Gasoline Range Hydrocarbons, Total, in the range >C5 to C12</p> <p>Petroleum Hydrocarbons in the range >C8 - C40</p> <p>Mercury</p>	<p>TM 181 by ICP-OES</p> <p>TM 222 by ICP-OES</p> <p>TM 018 by gravimetry</p> <p>TM 221 by ICP-OES</p> <p>TM 089 Headspace GC-FID based on USEPA Methods 8020 and 602</p> <p>TM 154 by Flash - GC-FID</p> <p>TM 418 by Cold Vapour Atomic Fluorescence Spectroscopy</p>



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SOILS (cont'd)	<u>Chemical Tests</u> (cont'd) Elemental Sulphur Sulphide Volatile Hydrocarbons: Dichlorodifluoromethane Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane Trans-1,2-dichloroethene Dichloromethane Chloroform 1,1,1-trichloroethane 1,1-dichloropropene Benzene carbon tetrachloride dibromomethane 1,2-dichloropropane bromodichloromethane trichloroethene cis-1,3dichloropropene 1,1,2-trichloroethane Toluene 1,3-dichloropropane dibromochloromethane tetrachloroethene 1,1,1,2-tetrachloroethane chlorobenzene ethylbenzene m/p-xylene Bromoform o-xylene 1,2,3-trichloropropane isopropylbenzene bromobenzene 2-chlorotoluene propylbenzene 4-chlorotoluene	TM 136 by HPLC TM 180 by ion selective electrode TM 116 by Headspace GC-MS based on USEPA Methods 8240, 8120, 8020, 624, 610 and 602



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SOILS (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Hydrocarbons: (cont'd) 1,2,4-trimethylbenzene 1,3-dichlorobenzene 1,4-dichlorobenzene Carbon disulphide 1,1-dichloroethene 1,1-dichloroethane cis-1,2-dichloroethene bromochloromethane 1,2-dibromoethane Styrene 4-isopropyltoluene 1,3,5-trimethylbenzene tert-butylbenzene 1,2-dichlorobenzene 1,2-dibromo-3-chloropropane naphthalene 1,2,3-trichlorobenzene Tert-butyl methyl ether 1,2-Dichloroethane Tert-amyl methyl ether 1,1,2,2-Tetrachloroethane</p> <p>pH</p> <p>Monohydric Phenols: phenol cresols xylenols 2,3,5-trimethyl phenol 2-isopropylphenol Total - Sum of the above 5 Monohydric Phenols</p> <p>Dichloromethane Extractable Compounds</p> <p>Extractable Petroleum Hydrocarbons (EPH), in the range >C8 to C40</p>	<p>TM 116 by Headspace GC-MS based on USEPA Methods 8240, 8120, 8020, 624, 610 and 602</p> <p>TM 133 using a GL pH Meter (Ref: Modified BS 1377:Part 3:1990)</p> <p>TM 062 by HPLC</p> <p>TM 004 by Solvent Extraction Apparatus</p> <p>TM 415 by solvent extraction and GCxGC-FID</p>



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SOILS (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Total Organic Carbon (TOC)</p> <p>Total Carbon</p> <p>Sulphur</p> <p>Polynuclear Aromatic Hydrocarbons (PAH): Naphthalene^{1,2} Acenaphthylene² Acenaphthene² Fluorene² Phenanthrene^{1,2} Anthracene^{1,2} Fluoranthene^{1,2} Pyrene² benz(a)anthracene^{1,2} Chrysene^{1,2} Benzo(b)fluoranthene² Benzo(k)fluoranthene^{1,2} Benzo(a)pyrene^{1,2} Indeno(123cd)pyrene^{1,2} Dibenzo(ah)anthracene² Benzo(ghi)perylene^{1,2}</p> <p>Speciated Extractable Petroleum Hydrocarbons: Total EPH >C10-C40 Aliphatic >C10-C12 Aliphatic >C12-C16 Aliphatic >C16-C21 Aliphatic >C21-C35 Aliphatic >C35-C40 Aromatic >C10-C12 Aromatic >C12-C16 Aromatic >C16-C21 Aromatic >C21-C35 Aromatic >C35-C40 Total Aliphatic >C10-C40 Total Aromatic >C10-C40</p>	<p>TM 132 by combustion method</p> <p>TM 132 by combustion method</p> <p>TM 132 by combustion method (ELTRA CS800)</p> <p>TM 218 by Solvent Extraction and GC-MS</p> <p>TM 414 by GCxGC-FID</p>



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SOILS	<u>Chemical Tests</u> Total cyanide Easily liberated/Free cyanide Thiocyanate Water Soluble Boron (10:1) Water Soluble Anions (2:1), specifically: Chloride Bromide Nitrate Sulphate Elemental Sulphur Arsenic Beryllium Cadmium Cobalt Chromium Copper Manganese Mercury Nickel Lead Zinc Exchangeable Ammonium pH Loss on ignition Water soluble sulphate 2:1 Water soluble chloride 2:1 Acid Extractable Sulphate	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil TM 153 by segmented flow analyser based on AWWA/APHA 20 th Edition - Method 4500 TM 222 by ICP-OES TM 019 by Ion Chromatography (IC) TM 136 by HPLC TM 181 by ICP-OES TM 024 by steam distillation and titration TM 133 by automated pH probe TM 018 by gravimetry TM 243 by Kone analyser TM 221 by ICP-OES



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SOILS (cont'd)	<u>Chemical Tests</u> (cont'd) Sulphide Total Organic Carbon (TOC) Hexavalent Chromium Polynuclear Aromatic Hydrocarbons (PAH): Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(123cd)pyrene Dibenzo(ah)anthracene Benzo(ghi)perylene	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd) TM 180 by ion selective electrode TM 132 by combustion method TM 151 by Kone analyser TM 218 by solvent extraction and GC-MS



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SOILS (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Hydrocarbons: Dichlorodifluoromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane Carbon Disulphide Tert-butyl methyl ether Trans-1,2-Dichloroethene 1,1-Dichloroethane Cis-1,2-Dichloroethene Bromochloromethane Chloroform 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon tetrachloride 1,2-Dichloroethane Benzene 1,2-Dichloropropane Dibromomethane Bromodichloromethane Cis-1,3-Dichloropropene Toluene 1,1,2-Trichloroethane 1,3-Dichloropropane Tetrachloroethene Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-tetrachloroethane Ethylbenzene o-Xylene 1,2,3-Trichloropropane Propylbenzene 1,3,5-Trimethylbenzene Bromoform Bromobenzene</p>	<p>Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd)</p> <p>TM 116 by Headspace GC-MS based on USEPA Methods 8240, 8120, 8020, 624, 610 and 602</p>



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SOILS (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Hydrocarbons (cont'd): 2-Chlorotoluene 4-Chlorotoluene Tert-Butylbenzene 4-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-Chloropropane Naphthalene</p> <p>Gasoline Range Hydrocarbons, Total, in the range >C5 to C12</p> <p>Extractable Petroleum Hydrocarbons (EPH), in the range >C8 to C40</p> <p>Monohydric Phenols: phenol cresols xlenols 2,3,5-trimethyl phenol 2-isopropylphenol Total - Sum of the above 5 Monohydric Phenols</p> <p>PCB congeners: PCB 28 PCB 52 PCB 77 PCB 81 PCB 101 PCB 105 PCB 114</p>	<p>Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd)</p> <p>TM 116 by Headspace GC-MS based on USEPA Methods 8240, 8120, 8020, 624, 610 and 602</p> <p>TM 089 Headspace GC-FID based on USEPA Methods 8020 and 602</p> <p>TM 415 by solvent extraction and GCxGC-FID</p> <p>TM 062 by HPLC based on MEWAM Book 124-1988/Second Site Property, March 2003, Method 17.7</p> <p>TM 168 using GC-MS</p>



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SOILS (cont'd)	<u>Chemical Tests</u> (cont'd) PCB congeners (cont'd): PCB 118 PCB 123 PCB 126 PCB 138 PCB 153 PCB 156 PCB 157 PCB 167 PCB 169 PCB 180 PCB 189	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil (cont'd) TM 168 using GC-MS
WATERS Potable water (non-regulatory), Ground water, Saline water, treated and untreated sewages and trade effluent Surface Water	<u>Chemical Tests</u> Hexavalent Chromium Gasoline Hydrocarbons: Total in the range >C5-C12, and Benzene Toluene Ethyl Benzene o-xylene m/p-xylene MTBE TAME	Documented In-House Method TM 241 by Kone Analyser TM 245 by Headspace GC-FID based on USEPA Methods 8020 and 602



1291

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ALS Life Sciences Limited

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Issue date: 20 October 2021

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<p>WATERS (cont'd)</p> <p>Ground water, surface water, treated and untreated sewages, landfill leachates (cont'd)</p> <p>Ground water, surface water, treated and landfill leachates</p> <p>Ground water, surface water, treated and untreated sewages, landfill leachates</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Dissolved Metals (cont'd):</p> <p>Tin Titanium Tungsten Uranium Vanadium Zinc</p> <p>Dissolved Metals:</p> <p>Antimony</p> <p>Total Metals:</p> <p>Aluminium Antimony Arsenic Barium Beryllium Bismuth Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Lithium Magnesium Manganese Molybdenum Nickel Potassium Phosphorus Silver Sodium Strontium Thallium Tin Titanium Tungsten Uranium Vanadium Zinc</p>	<p>Documented In-House Method</p> <p>TM 152 by ICP-MS with KED</p> <p>TM 152 by ICP-MS with KED</p> <p>TM 152 by ICP-MS with KED</p>



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WATERS (cont'd)	<u>Chemical Tests</u> (cont'd)	Documented In-House Method
Ground water, surface water, treated sewage and landfill leachates	Total Metals: Selenium	TM 152 by ICP-MS with KED
Surface Water, treated sewage effluent and trade effluent	Total Petroleum Hydrocarbons	TM 235 by Infra-red
Potable water (non-regulatory), Ground water, Surface waters and Final effluent	Extractable Petroleum Hydrocarbons C10 - C40	TM 172 by GC-FID
Surface Waters, Ground Waters	Semi-Volatile Organic Compounds (SVOCs), specifically Bis(2-chloroethyl)ether 2-Chlorophenol 1,4-Dichlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol N-nitrosodi-n-propylamine Hexachloroethane 4-Methylphenol Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene Hexachlorobutadiene 4-Chloro-3-methylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethyl phthalate Acenaphthylene 2,6-Dinitrotoluene	TM 176 by GC-MS



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<p>WATERS (cont'd)</p> <p>Surface Waters, Ground Waters (cont'd)</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Semi-Volatile Organic Compounds (SVOCs), specifically (cont'd)</p> <p>3-Nitroaniline Acenaphthene Dibenzofuran 2,4-Dinitrotoluene Fluorene Diethyl phthalate 4-Chlorophenylphenylether 4-Nitroaniline Azobenzene 4-Bromophenylphenylether Hexachlorobenzene Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate Benz(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(ghi)perylene</p>	<p>Documented In-House Method</p> <p>TM 176 by GC-MS</p>



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<p>WATERS (cont'd)</p> <p>Surface water, Groundwater Treated and Untreated Sewages, Trade Effluent, Landfill Leachate</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Hydrocarbons: Chloromethane Vinyl Chloride Chloroethane Dichloromethane 1,1-dichloroethane tert-butyl methyl ether cis-1,2-dichloroethene bromochloromethane chloroform 1,1,1-trichloroethane 1,1-dichloropropene benzene dibromomethane trichloroethene 1,1,2-trichloroethane toluene 1,3-dichloropropane 1,2-dibromoethane tetrachloroethene chlorobenzene m/p-xylene styrene o-xylene 1,2,3-trichloropropane isopropylbenzene bromobenzene 2-chlorotoluene propylbenzene 4-chlorotoluene n-butylbenzene naphthalene Dichlorofluoromethane Trans-1,2-dichloroethene ethylbenzene 1,2-dichloropropane bromomethane Tert-amyl methyl ether Trichlorofluoromethane 1,1-dichloroethene Carbon disulphide</p>	<p>Documented In-House Method</p> <p>TM 208 by Headspace GC-MS</p>



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<p>WATERS (cont'd)</p> <p>Surface water, Groundwater Sewages, Trade Effluent, Landfill Leachate (cont'd)</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Volatile Hydrocarbons: (cont'd) Bromodichlormethane trans-1,3-dichloropropene Dibromchloromethane 1,1,1,2-tetrachloroethane Bromoform 1,3,5-trimethylbenzene Tert-butylbenzene 1,2,4-trimethylbenzene Sec-butylbenzene 4-isopropyltoluene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2,4-trichlorobenzene 1,2-dichloroethane 1,1,2,2-tetrachloroethane 1,2-dichlorobenzene Cis-1,3-dichloropropene Hexachlorobutadiene 1,2,3-trichlorobenzene</p>	<p>TM 208 by Headspace GC-MS</p>
<p>Groundwater, Surface Water, Landfill Leachate , Treated and Untreated Sewages, Trade Effluents, Saline Waters, Potable Waters (non-regulatory)</p>	<p>pH</p>	<p>TM 256 using a GL pH Meter based on BS 1377:Part 3:1990</p>
<p>Groundwater, Landfill leachate, Treated and Untreated Sewages, Trade Effluents</p>	<p>Dissolved Oxygen</p>	<p>TM 187 by titration (including auto- titrator)</p>
<p>Groundwater, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents</p>	<p>Dissolved Mercury</p>	<p>TM 183 by Cold Vapour Atomic Fluorescence Spectroscopy</p>
<p>Groundwater, Surface Water, Treated and Untreated Sewages, Trade Effluents, Landfill Leachate, Potable Water (non-regulatory), Sea Water</p>	<p>pH Electrical Conductivity</p>	<p>TM 256 by automated robot (Skalar)</p>
<p>Ground Water, Surface Water, Treated and Untreated Sewages, Trade Effluents, Landfill Leachate, Sea Water</p>	<p>Alkalinity</p>	<p>TM 256 by automated robot (Skalar)</p>



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United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

ALS Life Sciences Limited

Issue No: 127

Issue date: 20 October 2021

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
WATERS (cont'd)	<u>Chemical Tests</u> (cont'd)	
Groundwater, Surface Water	Total Dissolved Solids (TDS) By Calculation	TM 256 by automated robot (Skalar)
Ground Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluent, Potable Water (non-regulatory)	Total Mercury	TM 183 by Cold Vapour Atomic Fluorescence Spectroscopy
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Chemical Oxygen Demand (COD) Filtered, settled & total	TM 107, PM210 using Dr Lange Kit,
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Biochemical Oxygen Demand (BOD) Settled & total	TM 045, PM210 based on MEWAM BOD5, 2 nd Edition 1988/AWWA/ APHA, 20 th Edition - Method 5210B
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Anions: Bromide Chloride Fluoride Nitrate Nitrate as N and NO ₃ Nitrite Nitrite as N and NO ₂ Phosphate Sulphate	TM 226 by ion chromatography
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents and Saline water	Alkalinity	TM 043 by titration and auto-titrator based on AWWA/APHA 20 th Edition - Method 2320B/ BS 2690:Part 109:1984 (Ref: BS 2690)



1291

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WATERS (cont'd)	<u>Chemical Tests</u> (cont'd)	
Groundwater, Surface Water, Saline water, Treated and Untreated Sewages, Trade Effluents	Ammonium Ammoniacal Nitrogen as N and NH ₃	TM 099 by Kone Analyser based on BS 2690 Part 7:1968/ BS 6068:Part 2.11:1984
Groundwater, surface water, Untreated Sewage, Treated Sewage, Trade Effluents	Total Inorganic Nitrogen (by calculation)	TM 184 by Kone analyser
Groundwater, Surface Water, Treated and Untreated Sewages, Trade Effluents	<u>Anions:</u> Total Oxidised Nitrogen (TON) TON as N and NO ₃ Chloride	TM 184 by automated discrete analyser (Kone)
Groundwater, Surface Water, Saline Water, Treated and Untreated Sewages, Trade Effluents	Sulphate as S and SO ₄ Phosphate as P and PO ₄ Nitrite as N and NO ₂	TM 184 by Kone analyser
Saline Water	Total Oxidised Nitrogen (TON) TON as N and NO ₃	TM 281 by Kone analyser
Groundwater, Surface Waters, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents, Saline water, Potable Water (non-regulatory)	Electrical Conductivity at 20 °C	TM 120 using a Digital Conductivity Meter based on BS 2690:Part 119:1981
Ground water, surface water, Landfill leachate, Untreated Sewage, Treated Sewage, Trade Effluent	Total Nitrogen Calculation of Kjeldahl Nitrogen	TM 212 by Skalar
Groundwater, Surface Water, Treated and Untreated Sewages, Trade Effluents, Saline water, Potable Water (non-regulatory)	Total Suspended Solids	TM 022 by Gravimetric Determination based on BS 2690:Part 120:1981



1291

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Waters (Cont'd)	<u>Chemical Tests</u> (cont'd)	
Untreated Sewage, Treated Sewage, Trade Effluent	Total Neutralised Suspended Solids Total Neutralised Suspended Solids (settled) Total Suspended Solids (settled)	TM 022, PM 210
Ground Water, Surface Water, Untreated Sewage, Treated Sewage, Trade Effluent	Volatile suspended solids at 500°C	TM 022 by gravimetry
Ground Water, Surface Water, Untreated Sewage, Treated Sewage, Trade Effluent	Non-volatile suspended solids at 500°C	TM 022 based on BS 2690:1981 part 120
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Total Inorganic Carbon	TM 090 by TOC Analyser
Groundwater, Surface Water	Total Organic Carbon (low level)	TM 295 by TOC Analyser
Groundwater, Surface Water, Potable Water (non-regulatory), Landfill Leachate, Treated and Untreated Sewage Effluents	Total Organic Carbon	TM 090 by TOC Analyser
Groundwater, Surface Water, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents,	Total Dissolved Solids	TM 021 by Gravimetric Determination based on BS 2690:Part 121:1981 or TM 123 by conductivity meter



1291

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WATERS (cont'd)	<u>Chemical Tests</u> (cont'd)	
Trade Effluent, Groundwater, Treated and Untreated Sewage, Landfill Leachate	Volatile Fatty Acids: Acetic acid Propionic Acid Isobutyric Acid Butyric Acid Isovaleric Acid Valeric Acid Caproic Acid Heptanoic Acid	TM 201 by GC-FID
Groundwater, Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Monohydric Phenols: Phenol Cresols Xylenols Sum of the above 3 Monohydric phenols	TM 259 by HPLC
Groundwater, Surface Water	Ferrous Iron	TM 125 using colorimetry
Groundwater, Potable Water (non-regulatory), Landfill Leachate, Treated and Untreated Sewages, Trade Effluents	Total Cyanide Easily Liberated (Free) Cyanide Thiocyanate	TM 227 by Segmented Flow Analyser
Ground Water, Surface Water, Landfill Leachate & Trade Effluents	Easily Liberated (Free) Cyanide Total Cyanide	TM 279 by SFA colorimetry
Groundwater, Potable Water (non-regulatory), Treated and Untreated Sewages, Trade Effluents,	Fluoride	TM 104 by Kone Analyser
Groundwater, Potable Water (non-regulatory), Saline Water, Treated and Untreated Sewages, Trade Effluents	Sulphide	TM 101 by automated discrete analyser (KONE)



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<p>WATERS (cont'd)</p> <p>Surface Water, Ground Water, Saline Water</p>	<p><u>Chemical Tests</u> (cont'd)</p> <p>Polynuclear Aromatic Hydrocarbons (PAH's): Naphthalene^{1,2} Acenaphthylene² Acenaphthene² Fluorene² Phenanthrene^{1,2} Anthracene^{1,2} Fluoranthene^{1,2} Pyrene² Benz(a)anthracene^{1,2} Chrysene^{1,2} Benzo(b)fluoranthene² Benzo(k)fluoranthene^{1,2} Benzo(a)pyrene^{1,2} Indeno(1,2,3-cd)pyrene^{1,2} Dibenzo(a,h)anthracene² Benzo(g,h,i)perylene^{1,2} Sum of "Dutch 10" PAHs (annotated ¹) Sum of "EPA 16" PAHs (annotated ²)</p>	<p>TM 178 by GC-MS</p>
<p>Surface and Saline waters</p>	<p>Volatile Hydrocarbons: Vinyl Chloride 1,1,1,2-tetrachloroethane 1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,1-Dichloropropene 1,2,3-Trichlorobenzene 1,2,3-Trichloropropane 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,2-Dibromo-3-Chloropropane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloropropane</p>	<p>TM 265 by Headspace GC-MS</p>



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WATERS (cont'd) Surface and Saline waters (cont'd)	<u>Chemical Tests</u> (cont'd) Volatile Hydrocarbons: (cont'd) 1,3,5-Trimethylbenzene 1,3-Dichlorobenzene 1,3-Dichloropropane 1,4-Dichlorobenzene 2-Chlorotoluene 4-Chlorotoluene 4-Isopropyltoluene Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Carbon tetrachloride Chlorobenzene Chloroethane Cis-1,2-Dichloroethene Cis-1,3-Dichloropropene Dibromochloromethane Dibromomethane Ethylbenzene Hexachlorobutadiene Isopropylbenzene Naphthalene n-Butylbenzene o-Xylene p/m-Xylene Propylbenzene Sec-Butylbenzene Styrene Tert-Butylbenzene Tetrachloroethene Toluene Trans-1,2-Dichloroethene Trans-1,3-Dichloropropene Trichloroethene Trichlorofluoromethane	TM 265 by Headspace GC-MS
Surface, Ground and Saline waters	Di (2-ethylhexyl) phthalate DEHP	TM 423 by GC-MS



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<p>WATERS (cont'd)</p> <p>Surface, Ground and Saline waters</p>	<p><u>Chemical Tests (cont'd)</u></p> <p>Hexabromocyclododecane (HBCDD)</p> <p>Cypermethrin</p>	<p>TM 421 by LC-MS-MS</p> <p>TM 422 by LC-MS-MS</p>
<p>WATERS & WASTE WATERS</p> <p>Groundwater, surface Water, Untreated sewage, Treated Sewage & Trade Effluent</p> <p>Untreated Sewage, Treated Sewage, Trade Effluent</p>	<p><u>Chemical Testing</u></p> <p>Turbidity</p> <p>Dissolved Metals, specifically: Aluminium Arsenic Cadmium Chromium Cobalt Copper Iron Lead Nickel Phosphorus Selenium Zinc</p>	<p>TM 195 by nephelometry</p> <p>TM 377 by ICP-MS with Kinetic Energy Discrimination (KED)</p>
<p>Untreated Sewage, Treated Sewage, Trade Effluent</p>	<p>Total Metals, specifically: Aluminium Arsenic Cadmium Chromium Cobalt Copper Iron Lead Nickel Phosphorus Zinc</p>	<p>TM 377 by ICP-MS with Kinetic Energy Discrimination (KED)</p>



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<p>WATERS & WASTE WATERS</p> <p>Groundwater, Surface Water and Treated Sewage Effluent</p>	<p><u>Chemical Testing</u></p> <p>Perfluorinated substances (PFAS): Perfluoro-n-butanoic acid Perfluoro-n-pentanoic acid Perfluoro-n-hexanoic acid Perfluoro-n-butanedisulfonate Perfluoro-n-heptanoic acid 6:2 fluorotelomer sulfonate Perfluoro-n-pentadisulfonate Perfluoro-n-octanoic acid Perfluoro-n-hexadisulfonate Perfluoro-n-nonanoic acid Perfluoro-n-heptadisulfonate Perfluoro-n-decanoic acid Perfluoro-n-octadisulfonate -linear Perfluorooctane sulfonate-branched Perfluoro-n-undecanoic acid Perfluoro-n-dodecanoic acid Perfluorooctanesulfonamide</p> <p>Total PFOS (linear & Branched)</p>	<p>TM 337 by LC-MS/MS</p>



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<p>WASTE WATERS</p> <p>Trade Effluent, Untreated Sewage and Treated Sewage Effluent</p>	<p><u>Chemical Testing</u></p> <p>Total Suspended Solids</p> <p>Ammonia Ammoniacal Nitrogen as N and NH₃</p> <p>pH</p> <p>Chemical Oxygen Demand (COD)</p> <p>Biochemical Oxygen Demand (BOD)</p> <p>Total Nitrogen</p> <p>Anions: Bromide Chloride Fluoride Nitrate Nitrate as N and NO₃ Nitrite Nitrite as N and NO₂ Total Oxidised Nitrogen (TON) as N Phosphate Sulphate</p>	<p>Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, treated sewage effluents and trade effluents</p> <p>TM 022 by Gravimetry</p> <p>TM 099 by discrete colorimetric analyser</p> <p>TM 256 by pH meter & by Automated Robot (Skalar)</p> <p>TM 107 by tube test</p> <p>TM 045 by DO meter</p> <p>TM 212 by Skalar</p> <p>TM 226 by Ion Chromatography</p>



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<p>WASTE WATERS (cont'd)</p> <p>Trade Effluent, Untreated Sewage and Treated Sewage Effluent</p>	<p><u>Chemical Testing</u> (cont'd)</p> <p>Total Metals, specifically: Aluminium Arsenic Cadmium Chromium Cobalt Copper Iron Lead Nickel Phosphorus Zinc</p> <p>Dissolved Metals, specifically: Aluminium Arsenic Cadmium Chromium Cobalt Copper Iron Lead Nickel Phosphorus Selenium Zinc</p>	<p>Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - sampling and chemical testing of untreated sewage, treated sewage effluents and trade effluents</p> <p>TM 377 by ICP-MS with Kinetic Energy Discrimination (KED)</p> <p>TM 377 by ICP-MS with Kinetic Energy Discrimination (KED)</p>
<p>END</p>		