

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <p>0126</p> <p>Accredited to ISO/IEC 17025:2005</p>	<h3>TERRA TEK Limited</h3> <p>Issue No: 034 Issue date: 09 June 2011</p>	
	<p>62 Rochsolloch Road Airdrie Lanarkshire Scotland ML6 9BG</p>	<p>Contact: Mr G Wilson Tel: +44 (0)1236 747949 Fax: +44 (0)1236 747849 E-Mail: airdrie@terratek.co.uk Website: www.terratek.co.uk</p>
<p>Testing performed by the Organisation at the locations specified below</p>		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
<p>Address 62 Rochsolloch Road Airdrie Lanarkshire Scotland ML6 9BG</p> <p>Local contact Mr J Murray Tel: +44 (0)1236 747949 Fax: +44 (0)1236 747849 Email: airdrie@terratek.co.uk</p>	<p>Testing Aggregates – mechanical & physical tests Rock - mechanical & physical tests Soils - mechanical & physical tests</p>	Airdrie
<p>Address Moor Lane Witton Birmingham B6 7HG</p> <p>Local contact Mr J Reynolds Tel: +44 (0)121 344 4838 Fax: +44 (0)121 356 3599 Email: birmingham@terratek.co.uk</p>	<p>Testing Aggregates - mechanical & physical tests Concrete – chemical tests Soils – mechanical, physical tests & chemical tests & MCERTS Waters – chemical tests</p>	Birmingham
<p>Address Mineral Lane Amersham Road Chesham Bucks HP5 1NL</p> <p>Local contact Mr G Watson Tel: +44 (0)1494 810136 Fax: +44 (0) 1494 784837 Email: chesham@terratek.co.uk</p>	<p>Testing: Aggregates – physical tests Soils – mechanical & physical tests</p>	Chesham



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Site activities performed away from the locations listed above:

Location details	Activity	Location code
All locations suitable for the activities listed		
Address & contact as above	Testing: Soils – mechanical & physical tests	Site: Airdrie Birmingham Chesham



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DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AGGREGATES	<u>Mechanical & Physical Tests</u>		
	Particle size distribution - washing and sieving	BS 812:Part 103:Section 103.1:1985	Airdrie
	Ten per cent fines value - dry - particle size 10mm and greater - (loads from 20 to 2000kN)	BS 812:Part 111:1990	Airdrie
	Ten per cent fines value – soaked - particle size 10mm and greater (loads from 20 to 2000kN)	BS 812:Part 111:1990	Airdrie
	Particle size distribution - sieving method	BS EN 933-1:1997	Airdrie Birmingham Chesham
	Particle shape - flakiness index	BS EN 933-3:1997	Airdrie
	Resistance to fragmentation by the Los Angeles Method	EN 1097-2:2010	Airdrie
Uniformity coefficient (221 2217)	BS 6100:Subsection 2.2.1:1992	Airdrie Birmingham Chesham	
ROCK	<u>Mechanical & Physical Tests</u>		
	Water content	ISRM Suggested Methods – Rock Characterization testing and Monitoring. Ed. E T Brown – 1981	Airdrie
	Porosity and density-by saturation and calliper techniques	ISRM Suggested Methods - Rock Characterization testing and Monitoring. Ed. E T Brown - 1981	Airdrie
End preparation of rock specimens for compressive strength	ASTM D 4543-08	Airdrie	



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ROCK (cont'd)	<u>Mechanical & Physical Tests</u>		
	Point load strength and anisotropy indices (loads from 1 to 50kN)	ISRM Suggested Methods – Rock Characterization Testing and Monitoring. Ed. E T Brown – 1981	Airdrie
	Unconfined compressive strength (loads from 10 to 2000kN)	ASTM D 7012-10	Airdrie
CONCRETE	<u>Chemical Tests</u>		
	Acid Soluble Chloride	TP031 using potentiometric titrimetry based on BS 1881: Part 124 1988	Birmingham
	Acid Soluble sulphate	TP095 using gravimetry based on BS 1881: Part 124 1988	Birmingham
SOILS for civil engineering purposes	<u>Mechanical & Physical Tests</u>		
	Moisture content - oven drying method	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Saturation moisture content of chalk	BS 1377:Part 2:1990	Chesham
	Liquid limit - cone penetrometer	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Liquid limit - cone penetrometer - one point	BS 1377:Part 2:1990	Birmingham Chesham
	Plastic limit	BS 1377:Part 2:1990	Airdrie Birmingham Chesham



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SOILS for civil engineering purposes (cont'd)	<u>Mechanical & Physical Tests</u>		
	Plasticity index and liquidity index	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Linear shrinkage	BS 1377:Part 2:1990	Chesham
	Density – linear measurement	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Particle density - gas jar	BS 1377:Part 2:1990	Airdrie Chesham
	Particle density - small pycnometer	BS 1377:Part 2:1990	Birmingham Chesham
	Particle size distribution - wet sieving	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Particle size distribution - dry sieving	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Particle size distribution - sedimentation - pipette method	BS 1377:Part 2:1990	Airdrie Birmingham Chesham
	Particle size distribution - sedimentation - hydrometer method		Airdrie
	<u>Chemical Tests</u>		
	Organic matter content	BS 1377:Part 3:1990	Birmingham
	Mass loss on ignition	BS 1377:Part 3:1990	Airdrie Birmingham
	Sulphate content of soil and ground water – gravimetric method	BS 1377:Part 3:1990	Birmingham



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SOILS for civil engineering purposes (cont'd)	<u>Mechanical & Physical Tests</u>		
	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	Dry density/moisture content relationship (4.5 kg rammer)	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	Dry density/moisture content relationship (vibrating hammer)	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	California Bearing Ratio (CBR) (loads from 0.4 to 50kN)	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	Moisture condition value (MCV) – natural moisture content	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	MCV/moisture content relation	BS 1377:Part 4:1990	Airdrie Birmingham Chesham
	Chalk crushing value	BS 1377:Part 4:1990	Chesham
	One-dimensional consolidation properties	BS 1377:Part 5:1990	Airdrie Birmingham Chesham
	Swelling and collapse characteristics	BS 1377:Part 5:1990	Chesham
	Permeability - constant head method	BS 1377:Part 5:1990	Chesham
	Dispersibility - pinhole method	BS 1377:Part 5:1990	Chesham
Permeability in a triaxial cell	BS 1377:Part 6:1990	Airdrie Birmingham Chesham	



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SOILS for civil engineering purposes (cont'd)	<u>Mechanical & Physical Tests</u>		
	Shear strength – small shearbox <i>(loads from 0 to 5 kN)</i>	BS 1377:Part 7:1990	Birmingham Chesham
	Shear strength – large shearbox <i>(loads from 0 to 100 kN)</i>	BS 1377:Part 7:1990	Birmingham Chesham
	Unconfined compressive strength - load frame method <i>(loads from 0 to 100 kN)</i>	BS 1377:Part 7:1990	Birmingham Chesham
	Residual strength - small ring shear apparatus <i>(loads from 0 to 0.5 kN)</i>	BS 1377:Part 7:1990	Birmingham
	Undrained shear strength - triaxial compression without measurement of pore pressure <i>(loads from 0.2 to 50kN)</i>	BS 1377:Part 7:1990	Airdrie Birmingham Chesham
	Undrained shear strength – triaxial compression with multistage loading and without measurement of pore pressure <i>(loads from 0.4 to 50kN)</i>	BS 1377:Part 7:1990	Airdrie Birmingham Chesham
	Effective shear strength - consolidated-undrained triaxial compression test with measurement of pore pressure <i>(loads from 0.4 to 50kN)</i>	BS 1377:Part 8:1990	Airdrie Birmingham Chesham
Effective shear strength - consolidated-drained triaxial compression test with measurement of volume change <i>(loads from 0.4 to 50kN)</i>	BS 1377:Part 8:1990	Airdrie Birmingham Chesham	



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SOILS for civil engineering purposes (cont'd)	<u>Mechanical & Physical Tests</u>		
	Uniformity coefficient (221 2217)	BS 6100:Subsection 2.2.1:1992	Airdrie Birmingham Chesham
	Effective angle of internal friction and effective cohesion (loads from 0 to 100 kN)	Specification for Highway Works, HMSO March 1998 Clause 636 using Large Shearbox	Birmingham Chesham
	Coefficient of friction and adhesion between fill and reinforcing elements or anchor elements (loads from 0 to 100 kN)	Specification for Highway Works, HMSO March 1998 Clause 639 using Large Shearbox	Birmingham Chesham
	Effective shear strength - (isotropically) consolidated undrained multistage triaxial compression test with measurement of pore pressure (loads from 0 to 100 kN)	Documented in-house method No TP 120	Birmingham Chesham
	Effective shear strength - (isotropically) consolidated drained multistage triaxial compression test with measurement of volume change (loads from 0 to 100 kN)	Documented in-house method No TP 120	Birmingham Chesham
	Horizontal permeability of road drainage layers - using the permeability box	DTp HA 41/90	Chesham
	Moisture condition value – at natural moisture content	SDD Tech Memo SH7/83. SDD Appls Guide No1 (Rev 1989)	Airdrie
Verification of MCA free-fall property - optical method	Documented In-House Method TP:07	Airdrie	
In-situ density - sand replacement method (small pouring cylinder)	BS 1377:Part 9:1990	Site: Birmingham Chesham	



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SOILS for civil engineering purposes (cont'd)	<u>Mechanical & Physical Tests</u>		
	In-situ density - sand replacement method (large pouring cylinder)	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	In-situ density - core cutter method	BS 1377:Part 9:1990	Site: Airdrie Chesham
	In-situ bulk density - nuclear method - comparative tests	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	In-situ bulk density - nuclear method - absolute tests	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	In-situ moisture density - nuclear method - comparative tests	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	In-situ moisture density - nuclear method - absolute tests	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	In-situ California Bearing Ratio (CBR) (loads from 0.4 to 50kN)	BS 1377:Part 9:1990	Site: Airdrie Birmingham Chesham
	Vertical deformation and strength characteristics of soil by the plate loading test (loads from 20 to 500kN)	BS 1377:Part 9:1990	Site: Airdrie Chesham
Moisture condition value – at natural moisture content	SDD Tech Memo SH7/83. SDD Appls Guide No1 (Rev 1989)	Site: Airdrie	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	<u>Chemical Tests</u>		
	Metals: Cadmium Chromium Copper Lead Manganese Nickel Zinc	TP037 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham
	Arsenic Selenium Antimony	TP038 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham
	Organic matter	TP041 based on BS 1377: Part 3: 1990	Birmingham
	Mercury	TP039 using cold vapour atomic absorption spectroscopy	Birmingham
	Hexavalent chromium	TP040 using colorimetry	Birmingham
	Water soluble boron	TP032 using colorimetry and TP 115 by ICP-OES	Birmingham
	Water soluble chloride	TP 134 by potentiometric titration	Birmingham
	Water soluble chloride	TPS 099 – by gravimetry - based on BS 1377	Birmingham
	pH	Documented in house procedure TP0 19 using pH electrode based on BS 1377: Part 3: 1990	Birmingham
	Acid Soluble Sulphide	TP0 51 using colorimetry	Birmingham
	Loss on ignition	TP042 based on BS 1377: Part 3: 1990	Birmingham
	Sulphate (water soluble) 2:1 extract	TP043 using gravimetry based on BS 1377: Part 3: 1990	Birmingham



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SOILS (cont'd)	<u>Chemical Tests</u>		
	Sulphate (acid soluble)	TP029 using gravimetry based on BS 1377: Part 3: 1990	Birmingham
	Cyanide: Free Total Complex	TP047 using colorimetry TP048 using colorimetry TP049 by calculation	Birmingham
	Phenols in soil	TP046 using colorimetry	Birmingham
	Toluene extractable matter (TEM)	TP 033 using gravimetry	Birmingham
	Thiocyanate	TP050 using colorimetry	Birmingham
	Sulphate (water soluble) 2:1 extract	TP043 using gravimetry based on BS 1377: Part 3: 1990	Birmingham
	Sulphate (acid soluble)	TP029 using gravimetry based on BS 1377: Part 3: 1990	Birmingham
	Acid Soluble Sulphide	TP 051 using colorimetry	Birmingham
	Elemental Sulphur	TP 052 using distillation and titration	Birmingham
	BTEX: benzene toluene ethylbenzene o-xylene m/p-xylene	TP 100 using headspace GC/FID	Birmingham
	MTBE n-hexane 1,3,5-trimethylbenzene 1,2,4-trimethylbenzene naphthalene		



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SOILS (cont'd)	<p><u>Chemical Tests</u></p> <p>Gasoline Range Organics (GRO) and banding: >C5-C6 >C6-C8 >C8-C10 >C10-C12 Total GRO C5-C12 Also aliphatic/aromatic fractionation and subsequent banding: Aliphatic: C5-C6 C6-C8 C8-C10 C10-C12 Total aliphatic C5-C12 Aromatic (equivalent carbon EC) C5-C6 C6-C8 C8-C10 C10-C12 Total aromatic C5-C12</p> <p>Polychlorinated Biphenyls (PCB's): PCB Congener 28 PCB Congener 52 PCB Congener 101 PCB Congener 118 PCB Congener 138 PCB Congener 153 PCB Congener 180</p>	<p>TP 110 using gas chromatography mass spectrometry (GC-MS)</p>	<p>Birmingham</p>



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SOILS (cont'd)	<u>Chemical Tests</u> Speciated Polyaromatic hydrocarbons (PAHs) Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a) pyrene Indeno(123cd)pyrene Dibenz(ah)anthracene Benzo(ghi)perylene Total PAH	TP045 using gas chromatography mass spectrometry (GC-MS)	Birmingham
	Extractable Petroleum Hydrocarbons >C8-C40 including	TP067 using gas chromatography with flame ionisation detection (GC-FID)	Birmingham
	Extractable Petroleum Hydrocarbons - aromatic/aliphatic fractionation and quantification according to carbon banding: >C8-C10 >C10-C12 >C12-C16 >C16-C21 >C21-C35 >C35-C40	TP126 using gas chromatography with flame ionisation detection (GC-FID)	Birmingham
WATERS Groundwater	<u>Chemical Tests</u> Metals: Cadmium Chromium Copper Lead Nickel Zinc	TP058 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd) Groundwater (cont'd)	<u>Chemical Tests</u>		
	Arsenic Selenium Antimony	TP053 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham
	Mercury	TP059 using cold vapour atomic absorption spectroscopy	Birmingham
	Hexavalent chromium	TP057 using colorimetry	Birmingham
	Boron	TP054 using colorimetry	Birmingham
	pH	TP020 using pH electrode based on BS 1377: Part 3: 1990	Birmingham
	Phenol	TP060 using colorimetry	Birmingham
	Cyanide: Free Total Complex	TP061 using colorimetry TP062 using colorimetry TP063 by calculation	Birmingham
	Thiocyanate	TP064 using colorimetry	Birmingham
	Sulphate	TP065 using gravimetry	Birmingham
	Sulphide	TP0 66 using colorimetry	Birmingham
	Chloride	TP 068 by potentiometric titration	Birmingham
	Fluoride	TP 080 by ISE	Birmingham
	Boron	TP 116 by ICP-OES	Birmingham
	Nitrite	TP 132 by colorimetry	Birmingham
	Dissolved solids	TP 035 by gravimetry	Birmingham
	Suspended solids	TP 081 by gravimetry	Birmingham
Conductivity	TP 108 by conductivity meter	Birmingham	
Hardness	TP 117 b ICP-OES	Birmingham	
Total Alkalinity	TP 118 by titrimetry	Birmingham	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS Groundwater (cont'd)	<u>Chemical Tests</u> BTEX benzene toluene ethylbenzene o-xylene m/p-xylene MTBE n-hexane 1,3,5-trimethylbenzene 1,2,4-trimethylbenzene naphthalene Gasoline Range Organics (GRO) and banding: >C5-C6 >C6-C8 >C8-C10 >C10-C12 Total GRO C5-C12 Also aliphatic/aromatic fractionation and subsequent banding: Aliphatic: C5-C6 C6-C8 C8-C10 C10-C12 Total aliphatic C5-C12 Aromatic (equivalent carbon EC) C5-C6 C6-C8 C8-C10 C10-C12 Total aromatic C5-C12	TP 104 using headspace GC/FID	Birmingham



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS Groundwater (cont'd)	<u>Chemical Tests</u> Speciated Polyaromatic hydrocarbons (PAHs) Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo(a) pyrene Indeno(123cd)pyrene Dibenz(ah)anthracene Benzo(ghi)perylene Total PAH	TP102 using gas chromatography mass spectrometry (GC-MS)	Birmingham
Groundwater (cont'd)	Semivolatile Organic Compounds (SVOC's): 1,2,4-trichlorobenzene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 2,4,5-trichlorophenol 2,4,6-trichlorophenol 2,4-dichlorophenol 2,4-dimethylphenol 2, 4-dinitrophenol 2, 4-dinitrotoluene 2, 6-dinitrotolunene 2-chloronaphthalene 2-chlorophenol 2-methylnaphthalene 2-methylphenol 2-nitroaniline 2-nitrophenol 3-nitroaniline 4-bromophenylphenylether 4-chloro-3-methyl phenol 4-chloroaniline 4-chlorophenyl phenyl ether 4-methylphenol	mass spectrometry (GC-MS)	



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WATERS Groundwater (cont'd)	<u>Chemical Tests</u> Semivolatile Organic Compounds (SVOC's):(cont'd) 4-nitroaniline 4-nitrophenol Acenaphthene Acenaphthylene Aniline Anthracene Azobenzene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Benzyl alcohol Bis(2-chloroethoxy)methane Bis(2-chloroethyl)ether Bis(2-ethylhexyl)phthalate Butyl benzyl phthalate Carbazole Chrysene Dibenz(a, h)anthracene Dibenzofuran Diethylphthalate Dimethylphthalate Di-n-butyl phthalate Di-n-octyl phthalate Diphenylamine Fluoranthene Fluorene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachloroethane Ideno(1, 2, 3-cd)pyrene Isophorone Naphthalene Nitrobenzene n-nitroso-di-n-propylamine Pentachlorophenol Phenanthrene Phenol Pyrene Total PAH (16)		
Effluent	Suspended solids	TP081 – by gravimetry	Birmingham



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SOILS	<u>Chemical Tests</u>	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	Metals: Cadmium Chromium Copper Lead Manganese Nickel Zinc	TP037 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham
	Antimony Selenium Arsenic	TP038 using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	Birmingham
	Mercury	TP039 using cold vapour atomic absorption spectroscopy	
	pH	TP019 using pH electrode based on BS 1377: Part 3: 1990	Birmingham
	Monohydric phenol	TP 06 using colorimetry	Birmingham
	Cyanide: Total	TP 048 using colorimetry	Birmingham
	Thiocyanate	TP 050 using colorimetry	Birmingham
	Acid Soluble Sulphide	TP0 51 using colorimetry	Birmingham
	Loss on ignition	TP042 based on BS 1377:Part 3:1990	Birmingham
	Sulphate (water soluble) 2:1 extract	TP043 using gravimetry based on BS 1377: Part 3: 1990	Birmingham
	Sulphate (acid soluble)	TP029 using gravimetry based on BS 1377: Part 3: 1990	Birmingham
	Water soluble boron	TP 115 using colorimetry	



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SOILS (cont'd)	<u>Chemical Tests</u>	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	Birmingham
	Water soluble chloride	TP 134 using potentiometric titration	Birmingham
	Water soluble chloride	TP 099 – based on BS 1377	Birmingham
	BTEX benzene toluene ethylbenzene o-xylene m/p-xylene	TP 100 using headspace GC/FID	Birmingham
	MTBE n-hexane 1,3,5-trimethylbenzene 1,2,4-trimethylbenzene naphthalene		
	Gasoline Range Organics (GRO) C5-C12		
	Polychlorinated Biphenyls (PCB's): PCB Congener 28 PCB Congener 52 PCB Congener 101 PCB Congener 118 PCB Congener 138 PCB Congener 153 PCB Congener 180	TP 110 using gas chromatography mass spectrometry (GC-MS)	Birmingham
Speciated Polyaromatic hydrocarbons (PAHs) Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene	TP045 using gas chromatography mass spectrometry (GC-MS)	Birmingham	



0126
Accredited to
ISO/IEC 17025:2005

Schedule of Accreditation
issued by
United Kingdom Accreditation Service
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

TERRA TEK Limited
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Testing performed by the Organisation at the locations specified

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	<u>Chemical Tests</u>	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	Birmingham
	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(a) pyrene Indeno(123cd)pyrene Dibenz(ah)anthracene Benzo(ghi)perylene Total PAH		Birmingham
	Extractable Petroleum Hydrocarbons >C8-C40	TP067 using gas chromatography with flame ionisation detection (GC-FID)	Birmingham
END			