

SOP no	Title	Parameters included	Method summary
2010	pH Value of Soils  UKAS accredited; MCERTS accredited	pH	Measurement of the electrochemical potential of a cell responsive to the hydrogen ion activity in a water extract of a dried and ground soil sample.
2020	Electrical Conductivity	electrical conductivity (EC) of aqueous extract	Measurement of the electrical resistance of a 2:1 extract in a cell of known dimensions.
2030	Moisture and Stone Content of Soils  Requirement of MCERTS	moisture content	Determination of the moisture content of soil as a percentage of its dry mass obtained at <37°C.
2040	Soil Description Requirement of MCERTS	soil description	As received soil is described based upon BS5930
2115	Total (Kjeldahl) Nitrogen in Soils	Kjeldahl Nitrogen	Organic nitrogen, ammonium & ammonia are converted to ammoniacal nitrogen by digestion with sulphuric acid in the presence of a copper catalyst. The ammonia liberated with sodium hydroxide is removed by steam distillation and determined titrimetrically.
2120	Water Soluble Boron  UKAS accredited ; MCERTS accredited	w/s boron	Automated inductively coupled plasma-optical emission spectroscopy (ICP-OES) analysis of a water extract of water soluble boron prepared from an aliquot of dried and ground soil sample.
2120	Water Soluble Sulphate in Soils  UKAS accredited ; MCERTS accredited	soluble sulphate	Automated inductively coupled plasma-optical emission spectroscopy (ICP-OES) analysis of a water extract of water soluble sulphate prepared from an aliquot of dried and ground soil sample.
2175	Total Sulphur in Soils  Submitted to UKAS for accreditation	total sulphur	Total sulphur in a soil sample is determined by high temperature combustion under oxygen, using an Eltra elemental analyser. Resultant sulphur dioxide is measured by infrared (IR) detector.
2180	Sulphur (Elemental) in Soils by HPLC  UKAS accredited; MCERTS accredited	sulphur	Aliquots of dried and ground soil are extracted into dichloromethane. The filtered extracts are analysed by high performance liquid chromatography (HPLC) using ultraviolet detection at 263nm.
2220	Water soluble Chloride in Soils  UKAS accredited; MCERTS accredited	chloride	Soil extracts are prepared by extracting dried and ground soil samples with water. Chloride is determined by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanide in Soils  UKAS accredited; MCERTS accredited	total cyanide	Aliquots of dried and ground soil are extracted into 1M sodium hydroxide. Automated analysis of the sample extract applying acid distillation of cyanide with uv radiation to break down metal complexed cyanides to hydrogen cyanide. Colorimetric development using buffered reaction with chloramine-T and 1,3-dimethylbarbituric acid/isonicotinic acid. Measurement of intensity of colour produced at 600nm.

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2300	Easily Liberatable Cyanide in Soils (free cyanide)  UKAS accredited; MCERTS accredited	Easily Liberatable (free) cyanide	Aliquots of dried and ground soil are extracted into 1M sodium hydroxide. Automated analysis of the sample extract applying acid distillation of cyanide to break down weakly complexed cyanides to hydrogen cyanide. Colorimetric development using buffered reaction with chloramine-T and 1.3-dimethylbarbituric acid/isonicotinic acid. Measurement of intensity of colour produced at 600nm.
2300	Thiocyanate in Soils  UKAS accredited; MCERTS accredited	thiocyanate	Aliquots of dried and ground soil are extracted into 1M sodium hydroxide. Automated analysis of the sample extract. Free cyanide is complexed by formaldehyde. Thiocyanate is converted to cyanogen chloride which reacts with chloramine-T and 1.3-dimethylbarbituric acid/isonicotinic acid. Measurement of intensity of colour produced at 600nm.
2325	Sulphide in Soils  UKAS accredited; MCERTS accredited	sulphide	Sulphide is released from dried and ground samples as hydrogen sulphide by steam distillation with sulphuric acid. The hydrogen sulphide is collected in a solution of 0.5M sodium hydroxide. Sulphide is then analysed by automated colorimetric analysis ('Aquakem 600' Discrete Analyser), using N,N-dimethyl-p-phenylenediamine.
2425	Extractable Ammonium in soils  UKAS accredited; MCERTS accredited	ammonium	Soil extracts are prepared by extracting dried and ground soil samples with potassium chloride solution. Ammonium is determined by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate.
2430	Total Sulphate in soils  UKAS accredited; MCERTS accredited	total sulphate	Acid digestion of a sample aliquot in heating block followed by determination of sulphate in extract by ICP-OES
2450	Acid Soluble Metals in Soils.  UKAS accredited; MCERTS accredited	metals, including arsenic; barium; beryllium; cadmium; chromium; cobalt; copper; lead; manganese; mercury; molybdenum; nickel; selenium; vanadium; zinc	Acid digestion of a sample aliquot in heating block followed by determination of metals in extract by inductively coupled plasma-mass spectrometry (ICP-MS).
2490	Hexavalent Chromium in Soils	chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils  UKAS accredited; MCERTS accredited	total organic carbon (TOC)	The TOC of a soil sample, acidified to remove inorganic carbon, is determined by high temperature combustion under oxygen, using an Eltra elemental analyser. Resultant carbon dioxide is measured by infrared (IR) detector.

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2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID  UKAS accredited; MCERTS accredited*	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO (SOP 2673).  *TPH C8–C40	Extraction of a soil sample, as received, into dichloromethane followed by determination of TPH by gas chromatography (GC) using flame ionisation detection (FID).
2675	Aliphatic/Aromatic split in Soils by GC-FID (cf. Texas Method 1006 / TPH CWG)	aliphatics: >C <sub>5</sub> –C <sub>6</sub> , >C <sub>6</sub> –C <sub>8</sub> , >C <sub>8</sub> –C <sub>10</sub> , >C <sub>10</sub> –C <sub>12</sub> , >C <sub>12</sub> –C <sub>16</sub> , >C <sub>16</sub> –C <sub>21</sub> , >C <sub>21</sub> –C <sub>35</sub> aromatics: >C <sub>5</sub> –C <sub>7</sub> , >C <sub>7</sub> –C <sub>8</sub> , >C <sub>8</sub> –C <sub>10</sub> , >C <sub>10</sub> –C <sub>12</sub> , >C <sub>12</sub> –C <sub>16</sub> , >C <sub>16</sub> –C <sub>21</sub> , >C <sub>21</sub> –C <sub>35</sub>	Extraction of a soil sample, as received, into pentane. Separation into aliphatic/aromatic fractions by column chromatography followed by determination of TPH in each fraction by gas chromatography (GC) using flame ionisation detection (FID).
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID  UKAS accredited; MCERTS accredited	acenaphthene; acenaphthylene; anthracene; benzo[a]anthracene; benzo[a]pyrene; benzo[b]fluoranthene; benzo[ghi]perylene; benzo[k]fluoranthene; chrysene; dibenz[ah]anthracene; fluoranthene; fluorene; indeno[123cd]pyrene; naphthalene; phenanthrene; pyrene	Extraction of a dried and ground soil sample into dichloromethane followed by determination of PAH by gas chromatography (GC) using flame ionisation detection (FID).
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS  UKAS accredited; MCERTS accredited*	volatile organic compounds, including BTEX and halogenated aliphatic/aromatics. (cf. USEPA Method 8260)  *please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	semi-volatile organic compounds (cf. USEPA Method 8270)	Extraction of a soil sample, as received, into dichloromethane followed by determination of semi-volatile organic compounds by gas chromatography (GC) using mass spectrometric detection (MS).
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS  UKAS accredited; MCERTS accredited*	Acenaphthene*; acenaphthylene*; anthracene*; benzo[a]anthracene*; benzo[a]pyrene*; benzo[b]fluoranthene*; benzo[ghi]perylene*; benzo[k]fluoranthene*; chrysene*; dibenz[ah]anthracene*; fluoranthene*; fluorene*; indeno[123cd]pyrene*; naphthalene*; phenanthrene*; pyrene*	Extraction of a dried and ground soil sample into dichloromethane followed by determination of PAH by gas chromatography (GC) with mass spectrometric detection (MS).

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2810	Polychlorinated Biphenyls (PCBs) in Soils by GC-MS	polychlorinated biphenyls expressed either as aroclors or congeners	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by determination of polychlorinated biphenyls by gas chromatography (GC) using mass spectrometric (MS) detection for identification and electron capture detection (ECD) for quantitation if present.
	UKAS accredited*; MCERTS accredited*	*as PCB aroclor 1242	
2820	Organophosphorus (O-P) Pesticides in Soils by GC-MS	organophosphorus pesticide representative suite including parathion, malathion etc, plus client specific determinands	Extraction of a soil sample, as received, into dichloromethane followed by determination of organophosphorus pesticides by gas chromatography (GC) using mass spectrometric detection (MS).
2830	Organonitrogen (O-N) Pesticides in Soils by GC-MS	organonitrogen pesticide representative suite including triazines etc, plus client specific determinands	Extraction of a soil sample, as received, into dichloromethane followed by determination of organonitrogen pesticides by gas chromatography (GC) using mass spectrometric detection (MS).
2840	Organochlorine (O-Cl) Pesticides in Soils by GC-MS	organochlorine pesticide representative suite including DDT and its metabolites, 'drins' and HCH etc, plus client specific determinands	Extraction of a soil sample, as received, into dichloromethane followed by determination of organochlorine pesticides by gas chromatography (GC) using mass spectrometric detection (MS).
2900	Phenols in Soils by GC-MS	approximately 24 substituted phenols, including chlorophenols	Extraction of a soil sample, as received, into dichloromethane followed by determination of phenols by gas chromatography (GC) using mass spectrometric detection (MS).
2920	Phenols in Soils by HPLC	phenolic compounds including phenol*, cresols, xylenols and trimethylphenols	Extraction of a soil sample, as received, into a 60:40 methanol/water mixture, followed by high performance liquid chromatography (HPLC) determination using electrochemical detection.
	UKAS accredited*; MCERTS accredited*	Note: chlorophenols are excluded.	