GEOENVIRONMENTAL STANDARDS FOR SOIL & SITE ASSESSMENT – 13 November 2020
An Occasional Newsletter

Typical Distribution:

BSI EH4	*AGS Laboratories Group*	*SCI Environment, Health & Safety Group committee*
BSI B526/3	*AGS Contaminated Land WG*	*Geol Soc CLSG committee*
SOBRA	*National Brownfield Forum*	

INTRODUCTION

BSI EH4 Soil Quality is the BSI technical committee responsible for the production of standards relating to soil quality including contaminated land and natural and near-natural sites (e.g. farm land). Standards cover sampling, chemical analysis, physical testing, biological testing, and soil and site assessment. EH4 also deals with standards for the analysis and testing of wastes.

BSI EH4 shadows ISO (International Organization for Standardization) Technical Committee *TC 190 Soil Quality* and CEN TC444 (*Sampling and test methods for Environmental characterization of solid matrices*). CEN is the European standards organisation.

ASBESTOS

ISO TC190 SC3 is taking the first steps towards deciding whether to produce standards related to determination of asbestos concentrations in soil materials including sampling and analysis. The intention is to start with an information gathering exercise to see what guidance documents and standards are available in member countries, and also to find out what other ISO TCs are doing – e.g. ISO TC147 *Air quality*.

CEN/TC 444/WG 3 has also agreed to review the existing technologies and standards for the determination of asbestos in soils and wastes in order to reflect market needs and state of the art as basis for a potential standardization project in CEN/TC 444. Relevant information is required from National Standards bodies by the end of the year.

BSI EH4 will need to decide how to respond to this initiative including how to engage with those involved in current asbestos-related activities in the UK. It is possible that a Working Group will be set up within BSI EH4. It would be helpful to hear from anyone who might like to contribute to the UK input.

These new ISO and CEN initiatives could be important because European Standards are usually automatically adopted as BSs (there have been some rule changes following the UK's exit from the EU and EEA).

The Draft Standing Committee of Analysts (SCA) document *The Quantification of Asbestos in Soil (2017)* was withdrawn during October because of poor performance data.

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ISO TC 190/WG3 - *SOIL FUNCTIONS/ECOSYSTEM SERVICES*

ISO TC190 has decided to set up a new Working Group (ISO TC190/WG3) to address soil functions and ecosystem services. The establishment of the WG is an important and potentially far reaching initiative and could bring significant societal and environmental benefits if done properly. It aligns with the UN Sustainable Development Goals (SDGs). There is likely to be an interesting dynamic with UK policy as we leave the EU and Government policies such as the basis of payment of 'Public Money for Public Goods', Environmental Land Management (ELMS), and other common agricultural policy CAP successor systems. See:

https://consult.defra.gov.uk/elm/elmpolicyconsultation/supporting_documents/ELM%20Policy%20Discussion%20Document%20230620.pdf

Initial tasks for the WG are:

- agreement on concepts and terminology ;
- agreement on a conceptual framework that clarifies soil functions and ecosystem services;
- to collate and analyse existing assessment methods of soil functions and services;
- to identify gaps in standards i.e. missing methods to assess functions and services.

Anyone interested in this initiative should review the outcomes from the EU INSPIRATION programme. The Inspiration Strategic Research Agenda (SRA) is available at: http://www.inspirationh2020.eu/sites/default/files/upload/documents/inspiration_sra_2018.pdf Further outputs can be found at http://www.inspiration-h2020.eu/ Paul Nathanial, a member of EH4, was involved in the INSPIRATION programme.

The Institution of Environmental Sciences (IES), represented on BSI EH4 by Chris Barret, has addressed the issues raised by this initiative via a small policy working group which produced a report intended to influence government and other stakeholders on the importance of soil health and function, post Brexit (contact Chris Barret - Chris.Barrett@arup.com). Anyone interested in the document published by the IES can review it here https://www.the-ies.org/resources/sustainable-soil-report.

REVISION OF STANDARD LEACHING TESTS

There are generally similar leaching test for soils and soil materials (BS EN ISO 21268 series[1]), wastes (BS EN 12457[2] series) and construction materials ([bsi] PD CEN/TS 16637 series[3]). ISO TC 190 is the lead for the ISO 21268 series and CEN TC444 for the EN 12457 series. CEN TC 351 is responsible for the CEN/TS 16637 series.

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1. BS EN ISO 21268-1 to -4:2019 *Soil quality – Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials – Parts 1 to 4*
2. BS EN 12457-1 to -4:2002 *Characterization of waste – Leaching – Compliance test for leaching of granular waste materials and sludges – Parts 1 to 4*
3. PD CEN/TS 16637-1 to -3:2018 *Construction products – Assessment of release of dangerous substances – Parts 1 to 3*

The standards in the EN 12457 have recently been confirmed but it is known that the inter-laboratory variability is unacceptably high. The tests in the parallel series are empirical tests. Small changes in the conditions of the test (e.g.

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particle size of samples, temperatures, pH of the leaching medium) can affect the result and thus both intra-laboratory and inter-laboratory variability. The CEN Working Group responsible for the EN 12457 series (TC444/WG1) has decided to address this issue in a cautious way (the standards were last revised in 2002). The first step will be to collect as much information as possible that will throw light on the reasons for the variability of results and help to identify the changes that might be made to the standards to reduce the variability of results (any changes cannot be radical because the usefulness of legacy data held by waste producers must be preserved). This information gathering exercise will cover both the EN 12457 series and the ISO 21268 series of standards.

Waste soils on occasion might need to be tested under all three series of leaching tests. There is a proposal from the German "shadow committee" for ISO TC444/WG1 that the EN 12457 series and the ISO 21268 series should be merged into a single series of standards with conditions of test being aligned where technically acceptable. There is a discussion note available which includes a tabulation comparing the test conditions in the two series. TC444/WG1 is seeking the views of National Standard Bodies (NSBs) on the German proposal. BSI is likely to oppose the proposal but does need to consult analytical community and others with an interest.

In parallel with the above activities, ISO TC444/WG1, is working to establish a searchable web-based archive (*Different batch leaching tests, contexts, practices, uses, and scientific background*) of published and unpublished reports on the application of standardised and other leaching test*s* with an emphasis on wastes.

BSI would welcome:

- offers of papers, reports and data to be included in the web-based archive;
- data and information relevant to the revision of the various standards, including examples of laboratory SOPs that would provide information on how the various tests are applied in practice;
- views on whether the EN 12457 and ISO 21268 series should be merged;
- offers to provide technical expertise, including from producers and users of leaching tests, to BSI technical committee EH4 and to TC444/WG1 on behalf of BSI.

CEN & ISO MEETINGS: SEPTEMBER - NOVEMBER 2020

All TC444 Working Groups (WGs) held, virtual meetings during September & October. A plenary meeting of TC 444 (*Sampling and test methods for Environmental characterization of solid matrices*) is scheduled for 17 November. ISO TC 190, its Sub-committees and numerous Working Groups also met during September & October. It is expected that CEN TC444 will set up two new Working Groups:

- WG7 – *Sampling*
- WG8 – *Assessment*

FUTURE OF BS1377

The test methods described in BS EN ISO 17892 parts 1 to 12 now supersede the same tests in BS 1377:1990 parts 2, 5, 6, 7 and 8, which should not be specified. Please see the relevant BSI webpages.

BSI Committee B/526/3, which holds responsibility for the technical content of BS 1377, has reviewed the current requirements for BS 1377 following publication of the EN ISO standards. The outcome of this review is the proposal to re-structure BS1377 into four parts as follows: Part 1 – General requirements and sample preparation; Part 2 – Classification tests and determination of geotechnical properties; Part 3 – Chemical and electrochemical tests; Part 4 –

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In-situ tests. Part 1, updated in 2016, covers general requirements and sample preparation. The new EN ISO Standards include equipment calibration and some sample preparation requirements, which take precedence over the requirements of Part 1. However, this document is still required for tests not included in BS EN ISO 17892 and a revision of Part 1 is not currently proposed.

BS 1377 Part 3 was revised recently and published as *BS 1377-3:2018 Methods of test for soils for civil engineering purposes - Chemical and electro-chemical testing*. An Amendment to *BS 1377-3:2018 Methods of test for soils for civil engineering purposes. Chemical and electro-chemical testing* has been published for public comment (closing dat6e 13 November).

Work has started to edit, update and consolidate the laboratory soil tests in BS 1377:1990 Parts 2, 4, 5, 6, 7 and 8. A draft replacement British Standard (*BS 1377-2 Methods of test for soils for civil engineering purposes*, *Part 2- Classification tests and determination of physical properties*) will be published for public comment in 2021.

The "new" BS 1377 Part 4 would replace the existing BS 1377 Part 9 covering field tests, some of which have been replaced by the BS EN ISO 22476 suite of standards such as standard penetration test. The proposed rationalisation of BS 1377 should improve consistency in the scheduling and application of both BS and EN ISO standards for laboratory testing in UK ground investigation practice.

Mike Smith

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Entries from before early March 2020
New or amended entries – Early March to 30 September 2020
New or amended entries – 1 October to 13 November 2020
Published standards – From 1 July to 31 August 2020
Published standards – From 1 to 30 September 2020
Published standards – 1-31 October 2020
Published standards – 1-30 November 2020

ISO terminology: CD = Committee Draft, DIS = Draft International Standard, FDIS = Final Draft International Standard, NWIP = New Work Item Proposal, WD = Working Draft

CEN terminology: prEN =enquiry stage (equivalent of DIS), FprEN = for Final Vote (equivalent of FDIS)

Copies of draft standards are available from the representatives of organisations that are members of BSI Technical Committee EH4 (e.g. AGS, EIC, SCI). If you do not know who represents an organisation to which you belong, you need to ask the organisation – this is not information that BSI is permitted to supply.

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BSI PROJECTS		
BS 1337-3 Amendment 1	Amendment to BS 1377-3:2018 Methods of test for soils for civil engineering purposes. Chemical and electro-chemical testing	Public comment period ended 13 November
PAS 128 (revision)	Underground utility detection, verification and location - Specification	Public comment period ended 16 March.
ISO/CEN GEOTECHNICAL STANDARDS		
BS EN ISO 18674 -4: 2020	**Geotechnical investigation and testing – Geotechnical monitoring by field instruments – Part 4: Measurement of pore water pressure: Piezometers**	**Published July 2020**
ISO DIS 22282-4	Geotechnical investigation and testing – Geohydraulic testing – Part 4: Pumping tests	Comment period ended 14 June 2020
BS EN ISO FDIS FprEN 22475-1	Geotechnical investigation and testing – Sampling of soil, rock and groundwater – Technical principles	Comment period ended 7 April 2020
ISO DIS prEN 22476-4	Geotechnical investigation and testing – Field testing – Part 4: Prebored pressure test by Ménard procedure	Comment period ended 28 August 2020
BS EN ISO 22476-9:2020	**Geotechnical investigation and testing – Field testing – Part 9: Field vane test (FVT and FVT-F)**	**Published October 2020**

PUBLISHED ISO & CEN STANDARDS ON SOIL & SITE ASSESSMENT Etc.		
BS EN ISO 11063:2020	**Direct extraction of soil DNA**	**Published October 2020**
BS EN ISO 11074:2015+A1:2020	**Soil quality - Vocabulary**	**Published September 2020** ***There are major issues with the Amendment which are to be dealt with by production of a new edition of the standard***

RECENTLY PUBLISHED ANALYTICAL AND OTHER TESTING SOIL QUALITY STANDARDS

BS ISO 13656:2020	**Soil, treated biowaste, sludge and waste – Digestion with hydrochloric (HCl), nitric (HNO_3) and tetrafluoroboric (HBF_4) or hydrofluoric (HF) acid mixture for subsequent determination of elements**	**Published November 2020**
BS EN ISO 15558-1 + A1:2020	**Soil quality – Risk-based petroleum hydrocarbons, Part 1: Determination of aliphatic and aromatic fractions of volatile petroleum hydrocarbons using gas chromatography (static headspace method)**	**Published July 2020**

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BS EN 17322:2020 + (corrigendum Oct 2020)	**Environmental solid matrices – Determination of polychlorinated biphenyls by gas chromatography – mass selective detection (GC-MS) or electron-capture detection (MS-ECD)**	**Published October 2020**

DRAFT ISO & CEN STANDARDS ON SOIL & SITE ASSESSMENT Etc.		
ISO DIS 12404 (revision of BS EN ISO 12404: 2015 & BS EN 16123:2013)	Soil & Waste - Selection & application of analytical screening methods for on-site use	Comment period ended 4 May. UK voted to disapprove but majority approved. Progressing to FDIS/FprEN.
ISO WD 18400-301	Sampling and measuring of volatiles in soil quality field investigations	ISO project initiated
ISO DIS 23400	Guidelines for the determination of organic carbon and nitrogen stocks and their variations in mineral soil at plot scale	Comment period ended 9 September 2020. Proceeding to FDIS.
ISO NP 24212	Remediation techniques applied at contaminated sites	Work in progress in ISO

SELECTED DRAFT ANALYTICAL AND BIOLOGICAL TESTING STANDARDS etc.

ISO FDIS 10390	Soil, sludge and treated biowaste – Determination of pH	Comment period ended 1 March 2020
ISO DIS 11916-3	Soil quality – Determination of selected explosives and related compounds – Part 3: Method using liquid chromatography-tandem mass spectrometry (LC-MS/MS)	Comment period ended 12 April 2020
CEN prEN 14735	Characterization of waste – Preparation of waste samples for ecotoxicity tests	Comment period ended 11 May 2020.
ISO DIS 15192	Characterization of soil and waste – Determination of Chromium (VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection	Comment period ended 10 June.
CEN prEN 15216	Environmental matrices – Determination of dissolved solids (TDS) in water and eluates – Complementary element	Comment period ended 9 December 2019
CEN prEN 15935	Sludge, treated biowaste, soil and waste – Determination of loss on ignition	Comment period ended 18 May
CEN prEN 15936	Sludge, treated biowaste, soil and waste – Determination of total organic carbon (TOC) by dry combustion	Comment period ended 17 August

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CEN pr EN 16166	Sludge, treated biowaste, soil and sediments – Determination of adsorbed organically bound halogens (AOX)	Comment period ended 17 August
CEN Fpr CEN/TS 16800	Guideline for the validation of physico-chemical analytical methods	Comment period ended 24 September
CEN prEN 17503	Environmental solid matrices – Determination of polycyclic aromatic hydrocarbons (PAH) by gas chromatography (GC) and high performance liquid chromatography (HPLC)	Comment period ended 30 June
CEN prEN 17505	Soil and waste characterization – Temperature dependent differentiation of total carbon (TOC400, ROC, TIC900)	Comment period ended 9 June.
CEN prEN 17516	Waste – Characterization of granular solids with potential for use as construction material – Compliance leaching test – Up-flow percolation test	Comment period ended 17 August
ISO NWIP 22171	Soil quality – Determination of potential cation exchange capacity (CEC) and exchangeable cations buffered at pH 7 using a molar ammonium acetate solution	Project initiated March 2020
ISO CD 24032	In-situ caging of snails to assess bioaccumulation of contaminants	Comment period ended 26 September 2019
ISO DIS 23646	Soil quality – Determination of organochlorine pesticides by gas chromatography with mass selective detection (GC-MS) and gas chromatography with electron—capture detection (GC-ECD)	Comments required by 3 October
ISO CD DTS 29843-2	Soil quality – Determination of soil microbial biodiversity – Part 2: Method by phospholid fatty acid analysis (PLFA) using the simple PLFA extraction method	Comment period ends 22 November
ISO FDIS 54321	Soil, treated biowaste, sludge and waste – Digestion of aqua regia soluble fractions of elements	Comment period ended 1 June
CEN NWIP	Characterization of environmental solid matrices – Halogen and sulfur by oxidative pyrohydrolytic combustion followed by ion chromatography detection and complementary determination methods	Subject to approval by CEN TC444

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Background

BSI EH4 Soil Quality is the BSI technical committee responsible for the production of standards relating to soil quality including contaminated land and natural and near-natural sites (e.g. farm land). Standards cover sampling, chemical analysis, physical testing, biological testing, and soil and site assessment. EH4 also deals with standards for the analysis and testing of wastes.

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EH4 is also responsible for BS10175 (investigation of contaminated sites), BS 8576 (ground gas investigations), BS8454 (protection of buildings against gas) and BS 1076 (soil sampling for VOC determination of VOCs).

There are about twenty organisations (e.g. trade bodies, learned societies, professional bodies, quasi-government bodies etc.) represented on the committee at present together with a handful of individual experts who represent the UK on various ISO and CEN Working Groups (e.g. Paul Nathanail, Mike Ramsey). To find out who represents a particular organisation, the organisation should be contacted.

Nominated representatives of member organisations receive copies of formal drafts of standards, known in the case of ISO as Committee Drafts (CDs), Draft International Standards (DISs) and Final Draft International Standards (FDISs); and in the case of BSI as Drafts for Public Comment. They also receive copies of published standards for personal use.

Those representing an organisation are expected to circulate papers to, and consult, those they represent. Draft standards can be posted on "members-only" sections of web-sites for downloading or can be e-mailed to all members of the organisation that is represented.

EH4 actively seeks to broaden its membership. The wider the membership of EH4, the greater the confidence there can be that the standards produced are technically sound and known about by potential users from a wide variety of backgrounds. It also increases the pool of people from which it might be possible to draw on from time to time to represent the UK in ISO and CEN Working Groups. BSI can nominate one or more experts to each of the numerous Working Groups in ISO TC190 and CEN TC444. Whilst experts will hopefully attend meetings of the WGs, in practice this is not always possible and participation is limited to receipt and review of papers. BSI makes a contribution towards the costs of UK experts attending ISO and CEN meetings.

Member organisations of EH4 include:

> Association of Geotechnical and Geoenvironmental Specialists (AGS), British Society of Soil Science, Centre for Ecology & Hydrology, Chartered Institute of Environmental Health, Environment Agency, Environmental Industries Commission (EIC) , EIC Contaminated Land Working Group, Environmental Services Association, Institution of Civil Engineers, Institution of Environmental Sciences, Ministry of Defence, National house Building Council (NHBC), Royal Society of Biology, Society of Brownfield Risk Assessment (SOBRA), Society of Chemical Industry (SCI), the James Hutton Institute, University of Glasgow, Water UK, Yorkshire & Lincolnshire Pollution Advisory Group.

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