



Performance Standard for Laboratories Undertaking Chemical Testing of Soil

Brief guide for procurers of analytical services

**Environment Agency
January 2007**



What is MCERTS?

The Environment Agency has established its Monitoring Certification Scheme (MCERTS) to deliver quality environmental measurements.

The scheme provides for the product certification of instruments, the competency certification of personnel and the accreditation of laboratories based on international standards. The MCERTS scheme was expanded in 2004 to include the chemical testing of soils, when a performance standard for laboratories was published.

Environment Agency policy (*'Chemical Test Data on Contaminated Soils – Qualification Requirements (307_03)'*) states:

“The performance standard is applicable to all laboratories and procurers of analytical services where results generated for the chemical testing of soil are submitted to the Environment Agency for regulatory purposes. The Environment Agency will only accept data from methods that have been accredited to the MCERTS standard.”

The Environment Agency's MCERTS website (www.mcerts.net) contains details of the standard and any briefing notes that may have been prepared in order to provide further clarification of the standard and aid interpretation. You can also link to the United Kingdom Accreditation Service (UKAS) website to obtain a list of accredited laboratories.

Why do you need to use it?

- The Environment Agency needs to be sure of the quality of the analytical results it receives so it can use them with confidence to make important regulatory decisions. It is essential that procurers of analytical data work closely with laboratories to ensure that exact requirements are understood and recorded.
- Soil is chemically and physically a complex matrix that presents many challenges to the analytical chemist. A test method that will perform adequately on a sandy soil may not work at all well on a clay soil.
- Analytical measurements cannot be carried out without random and systematic errors occurring. These can vary greatly between laboratories.
- Different forms of the same substance can be measured and it may be unclear exactly what has been reported.
- Levels of competency of staff carrying out analytical tests can vary from laboratory to laboratory.

How does the scheme work?

MCERTS requires laboratories that undertake the chemical testing of soil and submit data to the Environment Agency for assessment to be accredited to ISO 17025 for this MCERTS performance standard.

UKAS is the national accreditation body recognised by UK government to assess organisations that provide certification, testing, inspection and calibration services against internationally agreed standards, such as ISO 17025. Central to ISO 17025 is the laboratories quality system, and a fully documented quality manual which covers policies and procedures for accredited test methods, quality control, staff training and internal audit and review amongst others.

ISO 17025 gives requirements in general terms, and also guidance on how to develop specific applications. The Environment Agency, in collaboration with UKAS has produced one such application for chemical testing of soils.

Implications for the Procurer of Analytical Services

Procurers should:

- Ensure that chemical analysis results submitted to the Environment Agency for regulatory purposes conform to MCERTS requirements.
- Check whether the laboratory carrying out the analysis has MCERTS accreditation for all parameters requested. If not then they must sub-contract the non-accredited parameters to a laboratory that has the appropriate accreditation. If a suitable laboratory cannot be found then the Environment Agency should be contacted for advice.
- Ensure that the analytical methods employed by the laboratory are appropriate and fit for purpose in terms of the parameter, critical level of interest and matrix. The critical level of interest is the value around which a decision is often required, for example it may be a "soil guideline value", a regulatory limit, or some other concentration of importance, and the decision to be made is whether a concentration determined is above or below the value. In addition, it may be the range of concentrations of a parameter expected or usually determined or observed in a series of samples.
- Ensure that sampling procedures, preservation and transportation are appropriate for both the minimising the loss of parameters and the analytical methods being employed by the laboratory. Details need to be recorded.
- Ensure in collaboration with the laboratory that complete audit trails of samples are made by making all relevant information available, including:
 - location of sample, including depth where necessary;
 - unique sample code or reference;

- date/time sample taken;
- name of laboratory, including sub-contracting laboratory where necessary;
- date sample analysis completed;
- parameter analysed, including whether sample preserved or stabilised on site;
- whether analysis carried out on a dried or “as submitted” basis;
- result of analysis must be on a dry-weight basis;
- other relevant comments, for example, visual characteristics of sample.

Laboratory Requirements

- Selection and validation of test methods – analytical procedures shall be shown to be fit for purpose by establishment of performance characteristics. Where available, certified reference materials of appropriate matrices should be used.
- MCERTS is awarded by parameter, not to the laboratory as a whole.
- Details of sample pre-treatment should be recorded and reported, such as removal of constituents (stones etc.), crushing or grinding, sieving and preservation.
- The Environment Agency has set performance standards in terms of precision and bias, test methods must be shown to comply.
- Laboratories must take part in interlaboratory proficiency testing schemes, the results of which are statistically evaluated to assess laboratory performance. Each laboratory must document investigations into poor performance and corrective actions taken.
- Reporting requirements have been defined to achieve consistency.
- Laboratories must retain primary data for 6 years.
- ISO 17025 requires laboratories to ensure that they fully understand and document the requirements of their client and that the test methods they employ will meet these requirements.

Benefits of MCERTS

- Provides formal accreditation of laboratories in accordance with European and international standards.
- Provides assurance to all stakeholders (including industrial process operators, consultants, laboratories, regulators and the public) of the reliability of data from tests.

- Establishes a level playing field in this competitive market, based on the Environment Agency's requirements.
- Indicates that the chemical testing of soil is a critical component in producing defensible data for regulatory purposes.
- Promotes and raises the professional standing of laboratories by establishing "quality standards" to which all should aspire and be judged.