Technical Information

Advice Sheet 12: Quality Assurance at NRM

Introduction

Laboratory quality control and assurance are essential if the results from a laboratory are to have any meaning or value. Whilst speed of turnaround and cost are factors by which all clients judge a laboratory – accuracy and precision of results should take priority. Without accuracy and precision, analytical results are worthless and clients should consider the consequences of relying on inaccurate and imprecise data.

Accuracy is the ability to get as close as possible to the 'true value' for a particular analysis (think of this as the centre of a target in archery).

Precision is the ability to provide consistent results for the same analysis (think of this as a grouping of arrows on the target).

Note that neither is of any particular use on its own – it's no good being accurate once a week and inaccurate on other days (accuracy but no precision), nor is it of any use to be consistently inaccurate (precision but no accuracy) – hence accuracy and precision are so important. That is why we at NRM have systems and protocols to control and assure the quality of our data.

How is quality assured at NRM?

Good quality assurance has to be in both the systems and the culture of a laboratory. Quality assurance systems must not only follow the sample from its arrival at the laboratory to the point where data are reported but also the analytical and data management systems.

Staff are trained in quality systems and the importance of quality to the client – detailed training records are kept to ensure that only suitably trained personnel are analysing samples. They can quickly recognise when something is not right and have the skills or skilled colleagues to control the analytical quality of data.

The preparation and analytical **equipment** used is validated and maintained in accordance to strict protocols and schedules and is regularly tested for accuracy and precision.

Analytical methods are strictly controlled and follow Standard Operating Procedures that have been validated. All chemicals used in the methods are strictly controlled and records kept.

Data is handled by computers, which manage the vast quantity of data in the laboratory and seek to minimise human error. Samples are identified with a unique reference from the point they enter the laboratory and this reference is used for the sample all through the system to reporting.

NRM have quality manuals that state the policies and procedures required and the Compliance Manager oversees the routine internal inspection in accordance with this manual and monitors records and data to continually assure the quality of our output. We run quality control samples and standards in all our analytical batches. These samples, of known properties have been tested outside NRM to confirm their 'true value' for known analytical quantities.

There are many other ways in which NRM assure the quality of their data, but the principal method is by laboratory accreditation, supplemented with participation in ring testing schemes with other laboratories. NRM is a UKAS accredited laboratory and a REAL approved laboratory. These external inspections, accreditation and round robin schemes are described below.

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UKAS

BS EN ISO/IEC 17025 is the British, European and international standard for quality assurance in analytical laboratories. In the UK, laboratories that wish to claim compliance with this standard must be inspected and accredited by the United Kingdom Accreditation Service (UKAS). A laboratory that has been accredited by UKAS to ISO 17025 is permitted to display a Royal Crown Mark.

The standard covers both overall Quality Control procedures and method specific (i.e. parameter by parameter) procedures. Whilst laboratories achieving this standard are said to be UKAS registered (the individual registration number for each laboratory is shown under the UKAS logo on all paperwork) accreditation can only be claimed for individual methods that have been inspected and approved by UKAS.

The list of accredited methods is shown on NRM's UKAS schedule (UKAS 2334). Copies of this schedule, and NRM's UKAS certificate are available on request (see contact details below).

REAL (Compost and Digestate)

Renewable Energy Assurance Ltd carries out a range of certification schemes all of which promote sustainable energy. NRM is an approved laboratory in both the Biofertiliser Certification scheme (PAS110 digestate) and Compost Certification scheme (PAS100 Compost).

Contest

Contest is used to monitor our performance in contaminated soils and soil leachates.

Aquacheck

Aquacheck is used to monitor performance for analysis of sewage sludge and agricultural soil. Water analysis is also covered.

BIPEA

BIPEA is used to monitor our fertiliser methods. We participate for inorganic (mineral fertilisers) and for organic fertilisers.

WEPAL ISE

ISE is used to monitor standard soil performance and accredited UK MAFF methods + Loss on Ignition.

WEPAL MARSEP

MARSEP is used to monitor our total metals, Carbon and Nitrogen and Organic Matter in composts, sewage sludge / organic fertiliser.

NAPT

NAPT samples are used to check our Morgans methods and other routine soil analyses.

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FAPAS

Nitrate - FAPAS is used to monitor our performance for nitrate in GLV.

Pesticides - FAPAS is used to monitor our performance for pesticides.

InterCinD

This Industrial Fly Ash is used to monitor our accredited metals in IBA.

ILVO Vlarisub

This is used for Ammonium Lactate extractable elements in soil.

ISO 9001 and other quality assurance schemes you might see

The Joint ISO-ILAC-IAF Communique on the Management Systems Requirements of ISO/IEC 17025, General Requirements for the competence of testing and calibration laboratories states:

*A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results and calibrations. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.*

For laboratories that are only certified to ISO9001, this relates solely to the laboratory's quality management systems and it does not specifically evaluate the technical competence of a laboratory.

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