

As a result of an instruction from UKAS published last April as UKASATB001 the testing of soils for asbestos has become the most regulated testing that laboratories provide to the contaminated land sector. All asbestos reports must be accredited and laboratories have invested significantly in training and the validation of soil methods.

A number of techniques are employed to generate both qualitative and quantitative data for reporting which have with them associated terminology, references and abbreviations that need to be appreciated. Of note is that although quantification of asbestos in Asbestos Containing Materials (ACM) is no longer permissible, in soils it is required for hazardous waste on human health risk assessment. As with many procedures the terms used may be laboratory or client specific so an overview is presented here.

ASBESTOS CONTAINING MATERIALS SCREEN IN SOILS

Sample Preparation Technicians are trained to be vigilant for the presence of Asbestos Containing Materials (ACM), e.g. Asbestos Insulation Board (AIB) or other asbestos containing construction materials, in all soil samples arriving at the laboratory. This is in order to prevent fibre release from asbestos in samples being dried and ground in preparation for other tests.

If suspected ACM is found at this stage, or where a client's initial study indicated the possibility of ACM on a site and asbestos screening was requested, visual assessment of the entire sample is conducted by a trained Technician using the soil screen for ACM method. Any probable ACM is removed from the sample for further investigation and the client is contacted with the following options as to how to proceed with their sample/s:

1. Leave the report showing the initial findings
2. Report ACM as Suspected or Not Found
3. Report Suspected or Not Found and conduct a bulk asbestos identification on the suspected ACM

Any other analysis originally scheduled continues, where possible, on an as received (wet) sample basis. Please note that a sample as received may be reported as Not Suitable for some tests, while for other tests proceeding on an as received basis may be beyond the scope of the appropriate accreditation and results will therefore appear on the report as non-accredited.

This method may also be employed when a soil asbestos screen is scheduled and then the whole sample is examined and not just the material that is trayed out for drying. When this data is reported the test must be accredited.

ASBESTOS FIBRE IN SOILS

This method isolates and identifies asbestos fibres in the soil matrix, rather than distinct pieces of ACM. A representative sub-sample is obtained from a soil sample which must be between 200g and 1kg, by coning and quartering. Any fibres found are removed and mounted for Polarised Light Microscopy (PLM) according to the guidance in HSG248 Asbestos: The analysts guide for sampling, analysis and clearance procedures, HSE, 2005.

No limit of detection can be associated with this qualitative method, although by the detection of individual fibres it will be more sensitive than the method above. ▶

A NEW PERSPECTIVE ON ASBESTOS

By Phil Hellier, Project Director, CHEMTEST.

However if a laboratory is accredited for ACM or fibre quantification they can assign a limit of detection or quantification to the previous procedures if no material or fibres were detected.

ASBESTOS IDENTIFICATION IN BULK SAMPLES

The suspected bulk ACM is examined under a stereo-microscope, in a dust control cabinet, by a qualified Asbestos Analyst. Any fibres found are removed and mounted for Polarised Light Microscopy (PLM) according to the guidance in HSG248 Asbestos: The analysts guide for sampling, analysis and clearance procedures, HSE, 2005.

Asbestos is reported as Not Detected, Trace (if only one or two fibres are found) or Detected and the asbestos type/s present are reported in a format complying with the HSE guidance.

SEMI- QUANTITATIVE % OF ACM IN SOIL

This method allows for the percentage on a dry weight basis of the amount of asbestos in ACM recovered from a soil sample to be reported after identification for assessment against regulations for the disposal of hazardous/special wastes.

The method has a limit of detection of <0.1% for sample weights of typically between 200g and 1kg, and samples will be reported as either <0.1% (ie not detected) or >0.1%. It is now however becoming a requirement that if no ACM is found a fibre screen must be undertaken to ensure that the trigger level of 0.1% is not exceeded by gross fibre contamination.

FIBRE QUANTIFICATION

If quantification of asbestos fibres in the soil is required this is currently only available at a few laboratories. This method is often referenced as HSE REPORT No. 83/1996 Method 5. If a screened sample contains fibres a sub-sample is suspended in water and aliquots are removed and filtered. the filter is examined under phase contrast microscope and the fibres are counted and sized. The mass is estimated based upon the density of the material.

The limit of quantification is typically 0.001% with reported limit of detections of 0.0001%

With an appreciation of the services available pricing work and scheduling testing should be quite straightforward. However the possibility of tiered options with dependent options do not necessarily assist in this.

Expectations vary enormously, many projects are priced on rates and there is no regulated guidance on soil guideline values that would define the tests in a way that could be universally accepted. As an industry it must be acknowledged that the level of skill and time required in looking for lumps of ACM, compared to quantifying fibres to <0.001%, is significant and this impacts upon cost and turnaround.

Going forward consistent specifications of the testing requirements will enable laboratories to plan and develop the services required. However that will not tackle the old nut of what is the risk and how do you sample for it?

A number of groups are currently working to assign soil guidance values and good working practice for soils containing asbestos. However it should be recognised that there is already a range of expectations and published information. Therefore any further recommendations should add clarity so as to ensure that all involved will have risk derived limits and robust accredited data with which to make decisions. ■

