Checking the quality of contracted-out analysis

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Contracting-out is currently a popular method of getting analysis done. It is regarded as conferring two beneÞts: high quality, because you can select a Þrm that specialises in the type of analysis required; and low cost because the Þ Þstus

What can the customer do?

The first thing is to ensure that the contractor understands the customer's requirements. After consultation, they should draw up a clear specification of the type of test material and the sample size to be submitted. An essential item is the required upper limit to the uncertainty of the result. It must be specified whether or not this includes uncertainty from physical preparation by the contractor of the submitted material. If a wide range of concentrations is likely, the uncertainty should be specified as a function of the analyte concentration. The customer should obtain a written description of the laboratory's routine procedures and IQC, check that they are appropriate, and ask for access to relevant outcomes. The customer could also reasonably ask to see the laboratory's recent PT scores and records of action taken in response to any regarded as unsatisfactory.

Covert checking

Having done all that was possible in advance, the customer should also resort to blind checking. This is by no means an unfair or 'sneaky' procedure. Responsible contractors would encourage customers to do it. It is probably better to inform the laboratory that such checking will occur. In any event, if a problem occurred, the laboratory would have to be informed about the checking. The covert method should not be based on
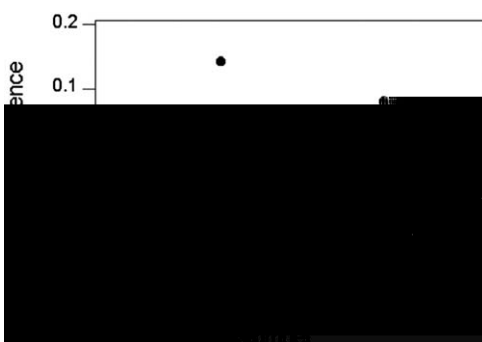
Fig. 4 Relative differences between duplicate results for Zn in soils and sediments (same data as in Fig 3). The standard deviation of c is 0.068, implying a repeatability relative standard deviation of 0.048 ¼ 0.068/1.414).

various quantiles of the normal distribution, should act like a Shewhart chart (but not showing the temporal sequence of course). The median of the expected relationship should on average divide compliant observations equally (Fig. 3). (For a

required relationship s_r ¼ f(c) the quantiles of the absolute differences will be as follows: the 50th percentile (i.e., the median) will be at 0.954 f(c); the 95th percentile at 2.77 f(c); the 99th at 3.64 f(c).)

Alternatively, in instances where a constant relative standard deviation is a reasonable assumption, individual values of d could be ÔnormalisedÕ as and the relative standard deviation calculated directly (Fig. 4).

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