

Consensus evaluation of radioactivity-in-soil reference materials in the context of an NPL Environmental Radioactivity Proficiency Test Exercise

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Content

There is continuing need for reference materials to underpin measurements of a wide range of sample types encountered during the decommissioning of nuclear sites in the UK and overseas. Consultations between the National Physical Laboratory (NPL) and UK radioanalytical laboratories have identified concrete, soil, metal and oil as key generic sample types requiring measurement for the accurate categorisation of waste. This paper describes the development of two radioactivity-in-soil reference materials at NPL – one for peat and one for soil with high sand content. Each material originated from a larger bulk sample of the soil type concerned prepared around 30 years ago at a UK research laboratory for the measurement of radionuclide uptake in plants. The two materials were separately processed, subdivided and measured at NPL before being sent to laboratories participating in the 2013 NPL Environmental Radioactivity Proficiency Test Exercise. The assigned values for the activity concentrations of the radionuclides in the materials were determined by a ‘consensus’ evaluation of the results obtained from 21 laboratories (for ‘sandy’ soil) and 12 laboratories (for peat) using the method described previously by Harms and Gilligan*. Activity concentrations were derived for ^{90}Sr , ^{137}Cs , ^{239}Pu and ^{241}Am by taking the Weighted Mean of the Largest Consistent Subset (WM LCS) of the reported data. Overall, 69% of the data for peat were in agreement with the WM LCS; the corresponding figure for sandy soil was 57%. The project demonstrated the use of the NPL Environmental Radioactivity Proficiency Test Exercises as a mechanism for delivering reference materials to the user community.

- Harms, A. and Gilligan, C., Appl. Radiat. Isotopes, 68, (2010) 1471-1476

About the Presenter

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