RSU INF 2021-08 (SEPTEMBER 2021)
WHEN IS URANIUM & THORIUM NOT RADIOACTIVE?

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STATUTORY CHANGES AND INTERPRETATION

1) Environmental Permitting Regulations and associated guidance changed in 2016 and 2018 respectively and the previous guidance was withdrawn in 2019 (see - www.gov.uk/government/publications/radioactive-substances-regulation-use-of-exemption-provisions).
2) Uranium and thorium compounds are used either (i) by virtue of a permit issued by the Environment Agency (ii) or under the terms and conditions of the **September 2018** 'exemption guidance: scope of and exemptions from the radioactive substances legislation in England, Wales and Northern Ireland' (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731733/RSL_Guidance_update_BEIS_format_v5_180803.pdf).
3) Users should acquaint themselves with the new legislation, which is significantly different to some of the conditions in the Radioactive Substances Act 1993. The essential changes are summarised in RSU INF 2021-01 'Accounting for very low-level radioactive materials'.

'Out of scope' and 'exempt'

4) The terms 'out of scope' and 'exempt' have different meanings in radioactive substances regulation (RSR).
   - **Out of scope** means there are no restrictions to keep, use, accumulate or dispose of waste; the quantities are specified in Table 1 and 2 of Schedule 23 of the EPR. When concentrations & quantities are higher than 'out of scope' levels regulations will apply.
   - **Exempt** means materials are outside RSR control if covered by an Environment Agency exemption e.g. Conditions must be met.
   - **Tables 3.2 and 3.3** of the 2018 exemption guidance apply https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731733/RSL_Guidance_update_BEIS_format_v5_180803.pdf.

'Not radioactive'

5) Table 2 of Part 3, Section 9 of Schedule 23 to the Environmental Permitting Regulations 2016 *www.legislation.gov.uk/uksi/2016/1154/schedule/23/made#f00139* provides a usable definition of radioactive material, which for thorium-232 and U-238 in secular equilibrium is **0.01 Bq/g**. From this it can be determined that at concentrations below 0.8 ppm and 2.46 ppm for uranium and thorium respectively these materials are by definition not radioactive.

1 Bq/kg U-238	= 81 ppb U-238	1 Bq/kg Th-232	= 246 ppb Th-232
1 Bq/g U-238	= 81 ppm U-238	1 Bq/g Th-232	= 246 ppm Th-232
0.01 Bq/g U-238	**= 0.8 ppm U-238**	**0.01 Bq/g Th-232**	**= 2.46 ppm Th-232**

USING CHARACTERISATION EQUIPMENT SUCH AS MICROSCOPY & ICP-MS

6) If samples placed in equipment are less than the quantities highlighted in the table, by definition they are not radioactive. [Example: when estimating the mass for material fixed to a microscopy stub the sample is the uranium plus the stub.]

EXEMPT QUANTITIES OF MATERIAL AND WASTE

Holding	Solid waste	Aqueous waste
5 kg uranium & thorium compounds	0.5 kg uranium & thorium compounds per week	0.5 kg uranium & thorium compounds per year