Disposal/ Clearance of waste including natural radionuclides

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Nuclear Regulation Authority,
Commissioner
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Clearance level for uranium in Japan

- Only for metal scrap from fabrication, enrichment and research facilities in the order of Reactor Regulation Act

Clearance level:

	Radioactive concentration [Bq/g]
U-232	0.1
U-234	1
U-235	1
U-236	10
U-238	1

- Calculated based on scenario of 10 μSv/y for public exposure with evaluation period of 100 years

Disposal is not assumed,
as metals are required to be recycled under the law

IAEA Safety Requirement: GSR part 3 Schedule I

TABLE I.2. LEVELS FOR EXEMPTION OF BULK AMOUNTS OF SOLID MATERIAL WITHOUT FURTHER CONSIDERATION AND FOR CLEARANCE OF SOLID MATERIAL WITHOUT FURTHER CONSIDERATION: ACTIVITY CONCENTRATIONS OF RADIONUCLIDES OF ARTIFICIAL ORIGIN

Radionuclide	Activity concentration (Bq/g)
U-230	10
U-231	100
U-232	0.1
U-233	1
U-236	10
U-237	100
U-239	100
U-240	100

No figures for U-234, 235, 238

Materials from practices are not included

TABLE I.3. LEVELS FOR CLEARANCE OF MATERIAL: ACTIVITY CONCENTRATIONS OF RADIONUCLIDES OF NATURAL ORIGIN

Radionuclide	Activity concentration (Bq/g)
K-40	10
Each radionuclide in the uranium decay chain or the thorium decay chain	1

(Reference) COUNCIL DIRECTIVE 2013/59/EURATOM

Article 30 Release from regulatory control

3. Member States shall ensure that for the clearance of materials containing naturally-occurring radionuclides, where these result from authorised practices in which natural radionuclides are processed for their radioactive, fissile or fertile properties, the clearance levels comply with the dose criteria for clearance of materials containing artificial radionuclides.

DEFINITIONS

radionuclides of natural origin

Radionuclides that occur naturally on Earth in significant quantities.

- The term is usually used to refer to the primordial radionuclides ^{40}K, ^{235}U, ^{238}U, ^{232}Th and their radioactive decay products.
- Contrasted with radionuclides of artificial origin; also artificial radionuclides, anthropogenic radionuclides and human-made radionuclides.

UK’s values of clearance level for solid materials

	NORM industrial activities e.g. • The production and use of gas mantles containing thorium oxides or salts • Any industrial activity utilising phosphate ore	in ‘practices’ artificial radionuclides and NORM used for their radioactive, fissile or fertile properties
U-238+ : U-238, Th-234, Pa-234m, Pa-234	5 Bq/g	1 Bq/g
U-238sec : U-238, Th-234, Pa-234m, Pa-234, U-234, Th-230, Ra-226, Rn-222, Po218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210	1 Bq/g	0.01 Bq/g

Reference: Department for Environment, Food & Rural Affairs, Welsh Government, Department of Agriculture, Environment and Rural Affairs (Northern Ireland), and Department for Business, Energy & Industrial Strategy, SCOPE OF AND EXEMPTIONS FROM THE RADIOACTIVE SUBSTANCES LEGISLATION IN ENGLAND, WALES AND NORTHERN IRELAND - Guidance document, 2018

Topics for discussion

- The value of clearance level for one nuclide (e.g. U-238) may differ, depending whether those from practices for nuclear or radioactive property/ or not (e.g. non-nuclear industry)?

- Scientifically reasonable to use the order of 10 μSv in a year for setting the values of clearance level for nuclides which widely exist on earth?