

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Zr-93		Unlimited	Unlimited	Unlimited	Unlimited	9.3×10 ⁻⁵	2.5×10 ⁻³
Zr-95 (a)		2.0	5.4×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	7.9×10 ²	2.1×10 ⁴
Zr-97 (a)		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	7.1×10 ⁴	1.9×10 ⁶

^a A₁ and/or A₂ values include contributions from daughter nuclides with half-lives less than 10 days.
^b The values of A₁ and A₂ in curies (Ci) are approximate and for information only; the regulatory standard units are Terabecquerels (TBq), (see § 171.10).
^c The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.
^d These values apply only to compounds of uranium that take the chemical form of UF₆, UO₂F₂ and UO₂(NO₃)₂ in both normal and accident conditions of transport.
^e These values apply only to compounds of uranium that take the chemical form of UO₃, UF₄, UCl₄ and hexavalent compounds in both normal and accident conditions of transport.
^f These values apply to all compounds of uranium other than those specified in notes (d) and (e) of this table.
^g These values apply to unirradiated uranium only.
^h A₁ = 0.1 TBq (2.7 Ci) and A₂ = 0.001 TBq (0.027 Ci) for Cf-252 for domestic use.
ⁱ A₂ = 0.74 TBq (20 Ci) for Mo-99 for domestic use.

[69 FR 3678, Jan. 26, 2004; 69 FR 55119, Sept. 13, 2004, as amended at 71 FR 54395, Sept. 14, 2006]

§ 173.436 Exempt material activity concentrations and exempt consignment activity limits for radionuclides.

The Table of Exempt material activity concentrations and exempt consignment activity limits for radionuclides is as follows:

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Ac-225	Actinium (89)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Ac-227		1.0×10 ⁻¹	2.7×10 ⁻¹²	1.0×10 ³	2.7×10 ⁻⁸
Ac-228		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-105	Silver (47)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-108m (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-110m		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-111		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Al-26	Aluminum (13)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Am-241	Americium (95)	1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Am-242m (b)		1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Am-243 (b)		1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Ar-37	Argon (18)	1.0×10 ⁶	2.7×10 ⁻⁵	1.0×10 ⁸	2.7×10 ⁻³
Ar-39		1.0×10 ⁷	2.7×10 ⁻⁴	1.0×10 ⁴	2.7×10 ⁻⁷
Ar-41		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁹	2.7×10 ⁻²
As-72	Arsenic (33)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
As-73		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
As-74		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
As-76		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
As-77		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
At-211	Astatine (85)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Au-193	Gold (79)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Au-194		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Au-195		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Au-198		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Au-199		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ba-131	Barium (56)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ba-133		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ba-133m		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ba-140 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Be-7	Beryllium (4)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Be-10		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁶	2.7×10 ⁻⁵
Bi-205	Bismuth (83)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Bi-206		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Bi-207		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Bi-210		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Bi-210m		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Bi-212 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Bk-247	Berkelium (97)	1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Bk-249	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Br-76	Bromine (35)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Br-77	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Br-82	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
C-11	Carbon (6)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
C-14	.....	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Ca-41	Calcium (20)	1.0×10 ⁵	2.7×10 ⁻⁶	1.0×10 ⁷	2.7×10 ⁻⁴
Ca-45	.....	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Ca-47	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Cd-109	Cadmium (48)	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁶	2.7×10 ⁻⁵
Cd-113m	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Cd-115	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Cd-115m	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Ce-139	Cerium (58)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ce-141	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Ce-143	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ce-144 (b)	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Cf-248	Californium (98)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cf-249	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Cf-250	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cf-251	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Cf-252	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cf-253	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Cf-254	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Cl-36	Chlorine (17)	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁶	2.7×10 ⁻⁵
Cl-38	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Cm-240	Curium (96)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Cm-241	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Cm-242	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Cm-243	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Cm-244	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cm-245	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Cm-246	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Cm-247	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Cm-248	.....	1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Co-55	Cobalt (27)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Co-56	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Co-57	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Co-58	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Co-58m	.....	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Co-60	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Cr-51	Chromium (24)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Cs-129	Cesium (55)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Cs-131	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Cs-132	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Cs-134	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cs-134m	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁵	2.7×10 ⁻⁶
Cs-135	.....	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Cs-136	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Cs-137 (b)	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Cu-64	Copper (29)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Cu-67	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Dy-159	Dysprosium (66)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Dy-165	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Dy-166	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Er-169	Erbium (68)	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Er-171	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-147	Europium (63)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-148	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-149	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Eu-150 (short lived)	.....	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-150 (long lived)	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-152	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-152m	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-154	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Eu-155	.....	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Eu-156	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
F-18	Fluorine (9)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Fe-52	Iron (26)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Fe-55	.....	1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁶	2.7×10 ⁻⁵
Fe-59	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Fe-60		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Ga-67	Gallium (31)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Ga-68		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Ga-72		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Gd-146	Gadolinium (64)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Gd-148		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Gd-153		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Gd-159		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Ge-68	Germanium (32)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Ge-71		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁸	2.7x10 ⁻³
Ge-77		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Hf-172	Hafnium (72)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Hf-175		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Hf-181		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Hf-182		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Hg-194	Mercury (80)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Hg-195m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Hg-197		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Hg-197m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Hg-203		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Ho-166	Holmium (67)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁵	2.7x10 ⁻⁶
Ho-166m		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
I-123	Iodine (53)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
I-124		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
I-125		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
I-126		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
I-129		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
I-131		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
I-132		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
I-133		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
I-134		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
I-135		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
In-111	Indium (49)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
In-113m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
In-114m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
In-115m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Ir-189	Iridium (77)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Ir-190		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Ir-192		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Ir-194		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
K-40	Potassium (19)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
K-42		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
K-43		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Kr-81	Krypton (36)	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
Kr-85		1.0x10 ⁵	2.7x10 ⁻⁶	1.0x10 ⁴	2.7x10 ⁻⁷
Kr-85m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ¹⁰	2.7x10 ⁻¹
Kr-87		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁹	2.7x10 ⁻²
La-137	Lanthanum (57)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
La-140		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Lu-172	Lutetium (71)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Lu-173		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Lu-174		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Lu-174m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Lu-177		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Mg-28	Magnesium (12)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Mn-52	Manganese (25)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Mn-53		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁹	2.7x10 ⁻²
Mn-54		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Mn-56		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Mo-93	Molybdenum (42)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁸	2.7x10 ⁻³
Mo-99		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
N-13	Nitrogen (7)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁹	2.7x10 ⁻²
Na-22	Sodium (11)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Na-24		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Nb-93m	Niobium (41)	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
Nb-94		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Nb-95		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Nb-97		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Nd-147	Neodymium (60)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Nd-149		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Ni-59	Nickel (28)	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁸	2.7x10 ⁻³

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Ni-63		1.0×10 ⁵	2.7×10 ⁻⁶	1.0×10 ⁸	2.7×10 ⁻³
Ni-65		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Np-235	Neptunium (93)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Np-236 (short-lived)		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Np-236 (long-lived)		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Np-237 (b)		1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Np-239		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Os-185	Osmium (76)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Os-191		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Os-191m		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Os-193		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Os-194		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
P-32	Phosphorus (15)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁵	2.7×10 ⁻⁶
P-33		1.0×10 ⁵	2.7×10 ⁻⁶	1.0×10 ⁸	2.7×10 ⁻³
Pa-230	Protactinium (91)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Pa-231		1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Pa-233		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴
Pb-201	Lead (82)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Pb-202		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Pb-203		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Pb-205		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Pb-210 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Pb-212 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Pd-103	Palladium (46)	1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁸	2.7×10 ⁻³
Pd-107		1.0×10 ⁵	2.7×10 ⁻⁶	1.0×10 ⁸	2.7×10 ⁻³
Pd-109		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Pm-143	Promethium (61)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Pm-144		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Pm-145		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Pm-147		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Pm-148m		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Pm-149		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Pm-151		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Po-210	Polonium (84)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Pr-142	Praseodymium (59)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Pr-143		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁶	2.7×10 ⁻⁵
Pt-188	Platinum (78)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Pt-191		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Pt-193		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Pt-193m		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Pt-195m		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Pt-197		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Pt-197m		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Pu-236	Plutonium (94)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Pu-237		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁷	2.7×10 ⁻⁴
Pu-238		1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Pu-239		1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Pu-240		1.0	2.7×10 ⁻¹¹	1.0×10 ³	2.7×10 ⁻⁸
Pu-241		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Pu-242		1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Pu-244		1.0	2.7×10 ⁻¹¹	1.0×10 ⁴	2.7×10 ⁻⁷
Ra-223 (b)	Radium (88)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Ra-224 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Ra-225		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Ra-226 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Ra-228 (b)		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁵	2.7×10 ⁻⁶
Rb-81	Rubidium (37)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Rb-83		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Rb-84		1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Rb-86		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Rb-87		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Rb(mat)		1.0×10 ⁴	2.7×10 ⁻⁷	1.0×10 ⁷	2.7×10 ⁻⁴
Re-184	Rhenium (75)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Re-184m		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Re-186		1.0×10 ³	2.7×10 ⁻⁸	1.0×10 ⁶	2.7×10 ⁻⁵
Re-187		1.0×10 ⁶	2.7×10 ⁻⁵	1.0×10 ⁹	2.7×10 ⁻²
Re-188		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁵	2.7×10 ⁻⁶
Re-189		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Re(mat)		1.0×10 ⁶	2.7×10 ⁻⁵	1.0×10 ⁹	2.7×10 ⁻²
Rh-99	Rhodium (45)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Rh-101		1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁷	2.7×10 ⁻⁴

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Rh-102		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Rh-102m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Rh-103m		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁸	2.7x10 ⁻³
Rh-105		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Rn-222 (b)	Radon (86)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁸	2.7x10 ⁻³
Ru-97	Ruthenium (44)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Ru-103		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Ru-105		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Ru-106 (b)		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
S-35	Sulphur (16)	1.0x10 ⁵	2.7x10 ⁻⁶	1.0x10 ⁸	2.7x10 ⁻³
Sb-122	Antimony (51)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁴	2.7x10 ⁻⁷
Sb-124		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Sb-125		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sb-126		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Sc-44	Scandium (21)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Sc-46		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Sc-47		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sc-48		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Se-75	Selenium (34)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Se-79		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
Si-31	Silicon (14)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Si-32		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Sm-145	Samarium (62)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Sm-147		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Sm-151		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁸	2.7x10 ⁻³
Sm-153		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sn-113	Tin (50)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Sn-117m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sn-119m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Sn-121m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Sn-123		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Sn-125		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Sn-126		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Sr-82	Strontium (38)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Sr-85		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sr-85m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Sr-87m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Sr-89		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Sr-90 (b)		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁴	2.7x10 ⁻⁷
Sr-91		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Sr-92		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
T(H-3)	Tritium (1)	1.0x10 ⁶	2.7x10 ⁻⁵	1.0x10 ⁹	2.7x10 ⁻²
Ta-178 (long-lived)	Tantalum (73)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Ta-179		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Ta-182		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Tb-157	Terbium (65)	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
Tb-158		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tb-160		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tc-95m	Technetium (43)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tc-96		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tc-96m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Tc-97		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁸	2.7x10 ⁻³
Tc-97m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Tc-98		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tc-99		1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
Tc-99m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Te-121	Tellurium (52)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Te-121m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Te-123m		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Te-125m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Te-127		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Te-127m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Te-129		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Te-129m		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Te-131m		1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Te-132		1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Th-227	Thorium (90)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Th-228 (b)		1.0	2.7x10 ⁻¹¹	1.0x10 ⁴	2.7x10 ⁻⁷
Th-229 (b)		1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
Th-230		1.0	2.7x10 ⁻¹¹	1.0x10 ⁴	2.7x10 ⁻⁷
Th-231		1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Th-232	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
Th-234 (b)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁵	2.7x10 ⁻⁶
Th (nat) (b)	1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
Ti-44	Titanium (22)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
Tl-200	Thallium (81)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Tl-201	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Tl-202	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Tl-204	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁴	2.7x10 ⁻⁷
Tm-167	Thulium (69)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Tm-170	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Tm-171	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁸	2.7x10 ⁻³
U-230 (fast lung absorption) (b),(d)	Uranium (92)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
U-230 (medium lung absorption) (e)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-230 (slow lung absorption) (f)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-232 (fast lung absorption) (b),(d)	1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
U-232 (medium lung absorption) (e)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-232 (slow lung absorption) (f)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-233 (fast lung absorption) (d)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-233 (medium lung absorption) (e)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
U-233 (slow lung absorption) (f)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
U-234 (fast lung absorption) (d)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-234 (medium lung absorption) (e)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
U-234 (slow lung absorption) (f)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
U-235 (all lung absorption types) (b),(d),(e),(f).	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-236 (fast lung absorption) (d)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-236 (medium lung absorption) (e)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
U-236 (slow lung absorption) (f)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U-238 (all lung absorption types) (b),(d),(e),(f).	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁴	2.7x10 ⁻⁷
U (nat) (b)	1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
U (enriched to 20% or less)(g)	1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
U (dep)	1.0	2.7x10 ⁻¹¹	1.0x10 ³	2.7x10 ⁻⁸
V-48	Vanadium (23)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶
V-49	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
W-178	Tungsten (74)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
W-181	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
W-185	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁷	2.7x10 ⁻⁴
W-187	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
W-188	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Xe-122	Xenon (54)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁹	2.7x10 ⁻²
Xe-123	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁹	2.7x10 ⁻²
Xe-127	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁵	2.7x10 ⁻⁶
Xe-131m	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁴	2.7x10 ⁻⁷
Xe-133	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁴	2.7x10 ⁻⁷
Xe-135	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ¹⁰	2.7x10 ⁻¹
Y-87	Yttrium (39)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Y-88	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Y-90	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁵	2.7x10 ⁻⁶
Y-91	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁶	2.7x10 ⁻⁵
Y-91m	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Y-92	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Y-93	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁵	2.7x10 ⁻⁶
Yb-169	Ytterbium (70)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁷	2.7x10 ⁻⁴
Yb-175	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Zn-65	Zinc (30)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Zn-69	1.0x10 ⁴	2.7x10 ⁻⁷	1.0x10 ⁶	2.7x10 ⁻⁵
Zn-69m	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Zr-88	Zirconium (40)	1.0x10 ²	2.7x10 ⁻⁹	1.0x10 ⁶	2.7x10 ⁻⁵
Zr-93 (b)	1.0x10 ³	2.7x10 ⁻⁸	1.0x10 ⁷	2.7x10 ⁻⁴
Zr-95	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁶	2.7x10 ⁻⁵
Zr-97 (b)	1.0x10 ¹	2.7x10 ⁻¹⁰	1.0x10 ⁵	2.7x10 ⁻⁶

^a [Reserved]

^b Parent nuclides and their progeny included in secular equilibrium are listed in the following:

- Sr-90 Y-90
- Zr-93 Nb-93m
- Zr-97 Nb-97
- Ru-106 Rh-106
- Cs-137 Ba-137m
- Ce-134 La-134
- Ce-144 Pr-144

Ba-140	La-140
Bi-212	Tl-208 (0.36), Po-212 (0.64)
Pb-210	Bi-210, Po-210
Pb-212	Bi-212, Tl-208 (0.36), Po-212 (0.64)
Rn-220	Po-216
Rn-222	Po-218, Pb-214, Bi-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208(0.36), Po-212 (0.64)
Ra-226	Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
Ra-228	Ac-228
Th-226	Ra-222, Rn-218, Po-214
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-229	Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209
Th-nat	Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-234	Pa-234m
U-230	Th-226, Ra-222, Rn-218, Po-214
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
U-235	Th-231
U-238	Th-234, Pa-234m
U-nat	Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
U-240	Np-240m
Np-237	Pa-233
Am-242	mAm-242
Am-243	Np-239

^c [Reserved]

^d These values apply only to compounds of uranium that take the chemical form of UF₆, UO₂F₂ and UO₂(NO₃)₂ in both normal and accident conditions of transport.

^e These values apply only to compounds of uranium that take the chemical form of UO₃, UF₄, UCl₄ and hexavalent compounds in both normal and accident conditions of transport.

^f These values apply to all compounds of uranium other than those specified in notes (d) and (e) of this table.

^g These values apply to unirradiated uranium only.

[69 FR 3685, Jan. 26, 2004]

§ 173.441 Radiation level limitations and exclusive use provisions.

(a) Except as provided in paragraph (b) of this section, each package of Class 7 (radioactive) materials offered for transportation must be designed and prepared for shipment, so that under conditions normally incident to transportation, the radiation level does not exceed 2 mSv/hour (200 mrem/hour) at any point on the external surface of the package, and the transport index does not exceed 10.

(b) A package which exceeds the radiation level limits specified in paragraph (a) of this section must be transported by exclusive use shipment, and the radiation levels for such shipment may not exceed the following during transportation:

(1) 2 mSv/h (200 mrem/h) on the external surface of the package unless the following conditions are met, in which case the limit is 10 mSv/h (1000 mrem/h):

(i) The shipment is made in a closed transport vehicle;

(ii) The package is secured within the vehicle so that its position remains fixed during transportation; and

(iii) There are no loading or unloading operations between the beginning and end of the transportation;

(2) 2 mSv/h (200 mrem/h) at any point on the outer surfaces of the vehicle, including the top and underside of the vehicle; or in the case of a flat-bed style vehicle, at any point on the vertical planes projected from the outer edges of the vehicle, on the upper surface of the load or enclosure if used, and on the lower external surface of the vehicle;

(3) 0.1 mSv/h (10 mrem/h) at any point 2 m (6.6 feet) from the outer lateral surfaces of the vehicle (excluding the top and underside of the vehicle); or in the case of a flat-bed style vehicle, at any point 2 m (6.6 feet) from the vertical planes projected by the outer edges of the vehicle (excluding the top and underside of the vehicle); and

(4) 0.02 mSv/h (2mrem/h) in any normally occupied space, except that this provision does not apply to carriers if they operate under the provisions of a State or federally regulated radiation protection program and if personnel under their control who are in such an occupied space wear radiation dosimetry devices.

(c) For shipments made under the provisions of paragraph (b) of this section, the offeror shall provide specific written instructions for maintenance of the exclusive use shipment controls to the carrier. The instructions must be included with the shipping paper information. The instructions must be