RULEMAKING NOTICE FORM

Notice Number _____	Rule Number **He-P 4062, He-P 4091, and He-P 4092**

1. Agency Name & Address: **Dept. of Health & Human Services** **Division of Public Health Services** **Radiological Health Section** **29 Hazen Drive** **Concord, NH 03301**	2. RSA Authority: **RSA 125-F:5, V** 3. Federal Authority: **Section 274 of the Atomic Energy Act of 1954 as amended** 4. Type of Action: Adoption _____ Amendment _____ Repeal _____ Readoption **X** Readoption w/amendment _____

5. Short Title: **Radiological Health Rules- Expiring Interim Rules**

6. (a) Summary of what the rule says and of any proposed amendments:

The Department of Health and Human Services Radiological Health Section (DHHS/RHS) proposing to readopt He-P 4062, He-P 4091, and He-P 4092. He-P 4062, He-P 4091, and He-P 4092 are currently interim rules and are scheduled to expire on March 23, 2020.

He-P 4062 sets forth the requirements that the waste generator must comply with to show that the material in question is properly classified, described, packaged, marked, labeled, and is in proper condition for transport.

He-P 4091 relates to quantities for use of radioactive materials with decommissioning of licensed facilities as specified in the decommissioning requirements contained in He-P 4030.07(j) and He-P 4030.09(i)-(r).

He-P 4092 relates to quantities of radioactive material requiring labeling.

He-P 4062, He-P 4091, and He-P 4092 need to readopted for DHHS/RHS to remain compatible with the US Nuclear Regulatory Commissioner (NRC) regulations.

6. (b) Brief description of the groups affected:

This rule provides for the protection of the health and safety of New Hampshire citizens, both workers and the general public, and to visitors of the state. He-P 4062 specifically affects any person involved in the transfer for disposal and the disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator, He-P 4091 specifically affects all groups that are licensed within the state to possess radioactive materials, and all licensees who are required to submit a decommissioning funding plan, and He-P 4092 specifically affects all users and generators of radioactive materials within the state.

6. (c) Specific section or sections of state statute or federal statute or regulation which the rule is intended to implement:

Rule	State or Federal Statute or Federal Regulation Implemented
He-P 4062.01 – 4062.03	RSA 125-F:5, IV&V; RSA 125-F:7, II-IV
He-P 4091.01- He-P 4091.03	RSA 125-F:5, V
He-P 4092.01	RSA 125-F:5, V

7. Contact person for copies and questions including requests to accommodate persons with disabilities:

Name: **Allyson Zinno**

Address: **Dept. of Health and Human Services**
Administrative Rules Unit
129 Pleasant Street, 2nd Floor
Concord, NH 03301

Title: **Administrative Rules Coordinator**

Phone #: **(603) 271-9604**

Fax#: **(603) 271-5590**

E-mail: **allyson.zinno@dhhs.nh.gov**

TTY/TDD Access: Relay NH 1-800-735-2964 or dial 711 (in NH)

The proposed rules may be viewed and downloaded at:
http://www.dhhs.nh.gov/oos/aru/comment.htm

8. Deadline for submission of materials in writing or, if practicable for the agency, in the electronic format specified: **Tuesday, March 3, 2020.**

☒ Fax ☒ E-mail ☐ Other format (specify):

9. Public hearing scheduled for:

Date and Time: **Tuesday, February 25, 2020 at 2:00pm.**

Place: **DHHS Brown Bldg., Auditorium, 129 Pleasant St., Concord, NH**

10. Fiscal Impact Statement (Prepared by Legislative Budget Assistant)

FIS # **20:001** , dated **January 16, 2020**

1. **Comparison of the costs of the proposed rule(s) to the existing rule(s):**
There is no difference in cost when comparing the proposed rules to the existing interim rules.

2. **Cite the Federal mandate. Identify the impact on state funds:**
The State of NH is an agreement state with the US Nuclear Regulatory Commission (NRC), pursuant to section 247b of the Atomic Energy Act of 1954, as amended. Accordingly, the state is required to have a program in place that is adequate and compatible with federal regulations. The Department of Health and Human Services state that the proposed rules are necessary in order to maintain compliance and consistency with NRC regulations. There is no impact on state funds.

3. **Cost and benefits of the proposed rule(s):**

A. To State general or State special funds:
None.

B. To State citizens and political subdivisions:
None.

C. To independently owned businesses:
None.

11. Statement Relative to Part I, Article 28-a of the N.H. Constitution:

The proposed rules modify an existing program or responsibility, but do not mandate any fees, duties or expenditures on the political subdivisions of the state, and therefore do not violate Part I, Article 28-a of the N.H. Constitution.

Readopt He-P 4062, effective 9-25-19 (Document #12873, Interim), to read as follows:

PART He-P 4062 REQUIREMENTS FOR TRANSFER OF LOW-LEVEL RADIOACTIVE WASTE FOR DISPOSAL AT LAND DISPOSAL FACILITIES, MANIFESTS, RECORDS, REPORTS, QUALITY ASSURANCE, AND AUDITS

He-P 4062.01 Purpose. The purpose of this rule is to set forth the requirements that the waste generator must comply with to show that the material in question is properly classified, described, packaged, marked, labeled and is in proper condition for transport.

He-P 4062.02 Scope. This rule shall apply to any person involved in the transfer for disposal and disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator.

He-P 4062.03 Transfer for Disposal and Manifests.

(a) Any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility must document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance with appendix G to 10 CFR part 20.

(b) Each shipment manifest must include a certification by the waste generator as specified in section II of appendix G to 10 CFR part 20.

(c) Each person involved in the transfer for disposal and disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator, shall comply with the requirements specified in section III of appendix G to 10 CFR part 20.

Readopt He-P 4091, effective 9-25-19 (Document #12874, Interim), to read as follows:

PART He-P 4091 QUANTITIES FOR USE WITH DECOMMISSIONING

He-P 4091.01 Quantities for Use With Decommissioning. The quantities for decommissioning of licensed facilities as specified in He-P 4030.07 (j) and He-P 4030.09 (i) through (r) inclusive shall be in compliance with Table 4091.1 below.

Table 4091.1 Quantities for Use with Decommissioning

Material	**Activity (µCi)** [1]
Americium-241	0.01
Antimony-122	100
Antimony-124	10
Antimony-125	10
Arsenic-73	100
Arsenic-74	10
Arsenic-76	10
Arsenic-77	100
Barium-131	10
Barium-133	10
Barium-140	10
Bismouth-210	1
Bromine-82	10
Cadmium-109	10
Cadmium-115m	10
Cadmium-115	100
Calcium-45	10
Calcium-47	10
Carbon-14	100
Cerium-141	100
Cerium-143	100
Cerium-144	1
Cesium-131	1000
Cesium-134m	100
Cesium-134	1
Cesium-135	10
Cesium-136	10
Cesium-137	10
Chlorine-36	10
Chlorine-38	10
Chromium-51	1000
Cobalt-58m	10
Cobalt-58	10
Cobalt-60	1
Copper-64	100
Dysprosium-165	10
Dysprosium-166	100

Material	Activity (µCi) [1]
Erbium-169	100
Erbium-171	100
Europium-152 (9.2 hrs)	100
Europium-152 (13 yr)	1
Europium-154	1
Europium-155	1
Florine-18	1000
Gadolinium-153	10
Gadolinium-159	100
Gallium-72	10
Germanium-71	0
Hafnium-181	10
Holmium-166	100
Hydorgen-3	1000
Indium-113M	100
Indium-114m	10
Indium-115m	100
Indium-115	10
Iodine-125	1
Iodine-126	1
Iodine-129	0.1
Iodine-131	1
Iodine-132	10
Iodine-133	1
Iodine-134	10
Iodine-135	10
Iridium-192	10
Iridium-194	100
Iron-55	100
Iron-59	10
Krypton-85	100
Krypton-87	10
Lanthanum-140	10
Lutetium-177	100
Manganese-52	10
Manganese-54	10
Manganese-56	10
Mercury-197m	100
Mercury-197	100
Mercury-203	10
Molybdeum-99	100
Neodymium-147	100
Neodymium-149	100
Nickel-59	100
Nickel-63	10
Nickel-65	100
Niobium-93m	10
Niobium-95	10
Niobium-97	10

Material	Activity (µCi) [1]
Osmium-185	10
Osmium-191m	100
Osmium-191	100
Osmium-193	100
Palladium-103	100
Palladium-109	100
Phosphorus-32	10
Platinum-191	100
Platinum-193m	100
Platnium-193	100
Platinum-197m	100
Platinum-197	100
Plutonium-239	0.01
Plonium-210	0.1
Potassium-42	10
Praseodymium-142	100
Praseodymium-143	100
Promethium-147	10
Promethium-149	10
Radium-226	0.01
Rhenium-186	100
Rhenium-188	100
Rhodium-103m	100
Rhodium-105	100
Rubidium-86	10
Rubidium-87	10
Ruthenium-97	100
Ruthenium-103	10
Ruthenium-105	10
Ruthenium-106	1
Samarium-151	10
Samarium-153	100
Scandium-46	10
Scandium-47	100
Scandium-48	10
Selenium-75	10
Silicon-31	100
Silver-105	10
Silver-110m	1
Silver-111	100
Sodium-22	1
Sodium-24	10
Strontium-85	10
Strontium-89	1
Strontium-90	0.1
Strontium-91	10
Strontium-92	10
Sulfur-35	100
Tantalum-182	10

Material	Activity (µCi) [1]
Technetium-96	100
Technetium-97m	100
Technetium-97	100
Technetium-99m	10
Technetium-99	10
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	100
Tellurium-129m	10
Tellurium-129	100
Tellurium-131m	10
Tellurium-132	10
Terbium-160	10
Thallium-200	100
Thallium-201	100
Thallium-202	100
Thallium-204	10
Thorium (nat.)	100
Thulium-170	10
Thulium-171	10
Tin-113	10
Tin-125	10
Tungsten-181	10
Tungsten-185	10
Tungsten-187	100
Uranium (nat)	100
Uranium-233	0.01
Uranium-234	0.01
Uranium-235	0.01
Vanadium-48	10
Xenon-131m	1000
Xenon-133	100
Xenon-135	100
Ytterbium-175	100
Yttrium-90	10
Yttrium-91	10
Yttrium-92	100
Yttrium-93	100
Zinc-65	10
Zinc-69m	1000
Zinc-69	10
Zirconium-93	10
Zirconium-95	10
Zirconium-97	10
Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.01

Material	**Activity (µCi)** [1]
Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	0.1

[1] Convert µCi to kBq, multiply µCi by 37.

He-P 4091.02 Quantities for Use with Decommissioning for Natural Thorium and Uranium. The quantities for use with decommissioning for Natural thorium and Natural Uranium shall be as follows:

(a) Thorium-Natural shall be based on the alpha disintegration rate from Thorium-232, Thorium-230,and their daughter products; and

(b) Uranium-Natural shall be based on the alpha disintegration rate of Uranium-238, Uranium-234, and Uranium-235.

He-P 4091.03 Combination of Isotopes. Where there is involved a combination of isotopes in known amounts, the limit for the combination shall be derived as follows:

(a) Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination; and

(b) The sum of the ratios for all the isotopes in the combination shall not exceed unity.

Readopt He-P 4092, effective 9-25-19 (Document #12875, Interim), to read as follows:

PART He-P 4092 QUANTITIES OF RADIOACTIVE MATERIAL REQUIRING LABELING

He-P 4092.01 Quantities of Radioactive Material Requiring Labeling. The limits of quantities of radioactive material which shall be labeled shall be in compliance with Table 4092.1 below:

Table 4092.1 Quantities[1, 2] of Radioactive Material Requiring Labeling

Atomic Number	Radionuclide	Quantity (μCi)[3]
1	Hydrogen-3	1000
4	Beryllium-10	1
4	Beryllium-7	1000
6	Carbon-11	1000
6	Carbon-14	100
9	Fluorine-18	1000
11	Sodium-22	10
11	Sodium-24	100
12	Magnesium-28	100
13	Aluminum-26	10
14	Silicon-31	1000
14	Silicon-32	1
15	Phosphorus-32	10
15	Phosphorus-33	100
16	Sulfur-35	100
17	Chlorine-36	10
17	Chlorine-38	1000
17	Chlorine-39	1000
18	Argon-39	1000
18	Argon-41	1000
19	Potassium-40	100
19	Potassium-42	1000
19	Potassium-43	1000
19	Potassium-44	1000
19	Potassium-45	1000
20	Calcium-41	100
20	Calcium-45	100
20	Calcium-47	100
21	Scandium-43	1000
21	Scandium-44	100
21	Scandium-44m	100
21	Scandium-46	10
21	Scandium-47	100
21	Scandium-48	100
21	Scandium-49	1000
22	Titanium-44	1

Atomic Number	Radionuclide	Quantity (μCi) [3]
22	Titanium-45	1000
23	Vanadium-47	1000
23	Vanadium-48	100
23	Vanadium-49	1000
24	Chromium-48	1000
24	Chromium-49	1000
24	Chromium-51	1000
25	Manganese-51	1000
25	Manganese-52	100
25	Manganese-52m	1000
25	Manganese-53	1000
25	Manganese-54	100
25	Manganese-56	1000
26	Iron-52	100
26	Iron-55	100
26	Iron-59	10
26	Iron-60	1
27	Cobalt-55	100
27	Cobalt-56	10
27	Cobalt-57	100
27	Cobalt-58	100
27	Cobalt-58m	1000
27	Cobalt-60	1
27	Cobalt-60m	1000
27	Cobalt-61	1000
27	Cobalt-62m	1000
28	Nickel-56	100
28	Nickel-57	100
28	Nickel-59	100
28	Nickel-63	100
28	Nickel-65	1000
28	Nickel-66	10
29	Copper-60	1000
29	Copper-61	1000
29	Copper-64	1000
29	Copper-67	1000
30	Zinc-62	100
30	Zinc-63	1000
30	Zinc-65	10
30	Zinc-69	1000
30	Zinc-69m	100
30	Zinc-71m	1000
30	Zinc-72	100
31	Gallium-65	1000
31	Gallium-66	100
31	Gallium-67	1000
31	Gallium-68	1000
31	Gallium-70	1000

Atomic Number	Radionuclide	Quantity (μCi) [3]
31	Gallium-72	100
31	Gallium-73	1000
32	Germanium-66	1000
32	Germanium-67	1000
32	Germanium-68	10
32	Germanium-69	1000
32	Germanium-71	1000
32	Germanium-75	1000
32	Germanium-77	1000
32	Germanium-78	1000
33	Arsenic-69	1000
33	Arsenic-70	1000
33	Arsenic-71	100
33	Arsenic-72	100
33	Arsenic-73	100
33	Arsenic-74	100
33	Arsenic-76	100
33	Arsenic-77	100
33	Arsenic-78	1000
34	Selenium-70	1000
34	Selenium-73	100
34	Selenium-73m	1000
34	Selenium-75	100
34	Selenium-79	100
34	Selenium-81	1000
34	Selenium-81m	1000
34	Selenium-83	1000
35	Bromine-74	1000
35	Bromine-74m	1000
35	Bromine-75	1000
35	Bromine-76	100
35	Bromine-77	1000
35	Bromine-80	1000
35	Bromine-80m	1000
35	Bromine-82	100
35	Bromine-83	1000
35	Bromine-84	1000
36	Krypton-74	1000
36	Krypton-76	1000
36	Krypton-77	1000
36	Krypton-79	1000
36	Krypton-81	1000
36	Krypton-83m	1000
36	Krypton-85	1000
36	Krypton-85m	1000
36	Krypton-87	1000
36	Krypton-88	1000
37	Rubidium-79	1000

Atomic Number	Radionuclide	Quantity (μCi) [3]
37	Rubidium-81	1000
37	Rubidium-81m	1000
37	Rubidium-82m	1000
37	Rubidium-83	100
37	Rubidium-84	100
37	Rubidium-86	100
37	Rubidium-87	100
37	Rubidium-88	1000
37	Rubidium-89	1000
38	Strontium-80	100
38	Strontium-81	1000
38	Strontium-83	100
38	Strontium-85m	1000
38	Strontium-85	100
38	Strontium-87m	1000
38	Strontium-89	10
38	Strontium-90	0.1
38	Strontium-91	100
38	Strontium-92	100
39	Yttrium-86	100
39	Yttrium-86m	1000
39	Yttrium-87	100
39	Yttrium-88	10
39	Yttrium-90	10
39	Yttrium-90m	1000
39	Yttrium-91	10
39	Yttrium-91m	1000
39	Yttrium-92	100
39	Yttrium-93	100
39	Yttrium-94	1000
39	Yttrium-95	1000
40	Zirconium-86	100
40	Zirconium-88	10
40	Zirconium-89	100
40	Zirconium-93	1
40	Zirconium-95	10
40	Zirconium-97	100
41	Niobium-88	1000
41	Niobium-89 (122 min)	1000
41	Niobium-89m (66 min)	1000
41	Niobium-90	100
41	Niobium-93m	10
41	Niobium-94	1
41	Niobium-95	100
41	Niobium-95m	100
41	Niobium-96	100
41	Niobium-97	1000
41	Niobium-98	1000

Atomic Number	Radionuclide	Quantity (μCi) [3]
42	Molybdenum-101	1000
42	Molybdenum-90	100
42	Molybdenum-93	10
42	Molybdenum-93m	100
42	Molybdenum-99	100
43	Technetium-101	1000
43	Technetium-104	1000
43	Technetium-93	1000
43	Technetium-93m	1000
43	Technetium-94	1000
43	Technetium-94m	1000
43	Technetium-96	100
43	Technetium-96m	1000
43	Technetium-97	1000
43	Technetium-97m	100
43	Technetium-98	10
43	Technetium-99	100
43	Technetium-99m	1000
44	Ruthenium-103	100
44	Ruthenium-105	1000
44	Ruthenium-106	1
44	Ruthenium-94	1000
44	Ruthenium-97	1000
45	Rhodium-100	100
45	Rhodium-101	10
45	Rhodium-101m	1000
45	Rhodium-102	10
45	Rhodium-102m	10
45	Rhodium-103m	1000
45	Rhodium-105	100
45	Rhodium-106m	1000
45	Rhodium-107	1000
45	Rhodium-99	100
45	Rhodium-99m	1000
46	Palladium-100	100
46	Palladium-101	1000
46	Palladium-103	100
46	Palladium-107	10
46	Palladium-109	100
47	Silver-102	1000
47	Silver-103	1000
47	Silver-104	1000
47	Silver-104m	1000
47	Silver-105	100
47	Silver-106	1000
47	Silver-106m	100
47	Silver-108m	1
47	Silver-111	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
47	Silver-112	100
47	Silver-115	1000
47	Silver-11Om	10
48	Cadmium-104	1000
48	Cadmium-107	1000
48	Cadmium-109	1
48	Cadmium-113	100
48	Cadmium-113m	0.1
48	Cadmium-115	100
48	Cadmium-115m	10
48	Cadmium-117	1000
48	Cadmium-117m	1000
49	Indium-109	1000
49	Indium-110 (69.1 min)	1000
49	Indium-111	100
49	Indium-112	1000
49	Indium-113m	1000
49	Indium-114m	10
49	Indium-115	100
49	Indium-115m	1000
49	Indium-116m	1000
49	Indium-117	1000
49	Indium-117m	1000
49	Indium-119m	1000
49	Indium-110 (4.9 h)	1000
50	Tin-110	100
50	Tin-111	1000
50	Tin-113	100
50	Tin-117m	100
50	Tin-119m	100
50	Tin-121	1000
50	Tin-121m	100
50	Tin-123	10
50	Tin-123m	1000
50	Tin-125	10
50	Tin-126	10
50	Tin-127	1000
50	Tin-128	1000
51	Antimony-115	1000
51	Antimony-116	1000
51	Antimony-116m	1000
51	Antimony-117	1000
51	Antimony-118m	1000
51	Antimony-119	1000
51	Antimony-120 (5.76 d)	100
51	Antimony-120 (16 min)	1000
51	Antimony-122	100
51	Antimony-124	10

Atomic Number	Radionuclide	Quantity (μCi) [3]
51	Antimony-124m	1000
51	Antimony-125	100
51	Antimony-126	100
51	Antimony-126m	1000
51	Antimony-127	100
51	Antimony-128 (10.4 min)	1000
51	Antimony-128 (9.01 h)	100
51	Antimony-129	100
51	Antimony-130	1000
51	Antimony-131	1000
52	Tellurium-116	1000
52	Tellurium-121	100
52	Tellurium-121m	10
52	Tellurium-123	100
52	Tellurium-123m	10
52	Tellurium-125m	10
52	Tellurium-127	1000
52	Tellurium-127m	10
52	Tellurium-129	1000
52	Tellurium-129m	10
52	Tellurium-131	100
52	Tellurium-131m	10
52	Tellurium-132	10
52	Tellurium-133	1000
52	Tellurium-133m	100
52	Tellurium-134	1000
53	Iodine-120	100
53	Iodine-120m	1000
53	Iodine-121	1000
53	Iodine-123	100
53	Iodine-124	10
53	Iodine-125	1
53	Iodine-126	1
53	Iodine-128	1000
53	Iodine-129	1
53	Iodine-130	10
53	Iodine-131	1
53	Iodine-132	100
53	Iodine-132m	100
53	Iodine-133	10
53	Iodine-134	1000
53	Iodine-135	100
54	Xenon-120	1000
54	Xenon-121	1000
54	Xenon-122	1000
54	Xenon-123	1000
54	Xenon-125	1000
54	Xenon-127	1000

Atomic Number	Radionuclide	Quantity (μCi) [3]
54	Xenon-129m	1000
54	Xenon-131m	1000
54	Xenon-133	1000
54	Xenon-133m	1000
54	Xenon-135	1000
54	Xenon-135m	1000
54	Xenon-138	1000
55	Cesium-125	1000
55	Cesium-127	1000
55	Cesium-129	1000
55	Cesium-130	1000
55	Cesium-131	1000
55	Cesium-132	100
55	Cesium-134	10
55	Cesium-134m	1000
55	Cesium-135	100
55	Cesium-135m	1000
55	Cesium-136	10
55	Cesium-137	10
55	Cesium-138	1000
56	Barium-126	1000
56	Barium-128	100
56	Barium-131	100
56	Barium-131m	1000
56	Barium-133	100
56	Barium-133m	100
56	Barium-135m	100
56	Barium-139	1000
56	Barium-140	100
56	Barium-141	1000
56	Barium-142	1000
57	Lanthanum-131	1000
57	Lanthanum-132	100
57	Lanthanum-135	1000
57	Lanthanum-137	10
57	Lanthanum-138	100
57	Lanthanum-140	100
57	Lanthanum-141	100
57	Lanthanum-142	1000
57	Lanthanum-143	1000
58	Cerium-134	100
58	Cerium-135	100
58	Cerium-137	1000
58	Cerium-137m	100
58	Cerium-139	100
58	Cerium-141	100
58	Cerium-143	100
58	Cerium-144	1

Atomic Number	Radionuclide	Quantity (μCi) [3]
59	Praseodymium-136	1000
59	Praseodymium-137	1000
59	Praseodymium-138m	1000
59	Praseodymium-139	1000
59	Praseodymium-142	100
59	Praseodymium-142m	1000
59	Praseodymium-143	100
59	Praseodymium-144	1000
59	Praseodymium-145	100
59	Praseodymium-147	1000
60	Neodymium-136	1000
60	Neodymium-138	100
60	Neodymium-139	1000
60	Neodymium-139m	1000
60	Neodymium-141	1000
60	Neodymium-147	100
60	Neodymium-149	1000
60	Neodymium-151	1000
61	Promethium-141	1000
61	Promethium-143	100
61	Promethium-144	10
61	Promethium-145	10
61	Promethium-146	1
61	Promethium-147	10
61	Promethium-148	10
61	Promethium-148m	10
61	Promethium-149	100
61	Promethium-150	1000
61	Promethium-151	100
62	Samarium-141	1000
62	Samarium-141m	1000
62	Samarium-142	1000
62	Samarium-145	100
62	Samarium-146	1
62	Samarium-147	100
62	Samarium-151	10
62	Samarium-153	100
62	Samarium-155	1000
62	Samarium-156	1000
63	Europium-145	100
63	Europium-146	100
63	Europium-147	100
63	Europium-148	10
63	Europium-149	100
63	Europium-150 (12.62 h)	100
63	Europium-150 (34.2 y)	1
63	Europium-152	1
63	Europium-152m	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
63	Europium-154	1
63	Europium-155	10
63	Europium-156	100
63	Europium-157	100
63	Europium-158	1000
64	Gadolinium-145	1000
64	Gadolinium-146	10
64	Gadolinium-147	100
64	Gadolinium-148	0.001
64	Gadolinium-149	100
64	Gadolinium-151	10
64	Gadolinium-152	100
64	Gadolinium-153	10
64	Gadolinium-159	100
65	Terbium-147	1000
65	Terbium-149	100
65	Terbium-150	1000
65	Terbium-151	100
65	Terbium-153	1000
65	Terbium-154	100
65	Terbium-155	1000
65	Terbium-156	100
65	Terbium-156m (24.4 h)	1000
65	Terbium-156m (5.0 h)	1000
65	Terbium-157	10
65	Terbium-158	1
65	Terbium-160	10
65	Terbium-161	100
66	Dysprosium-155	1000
66	Dysprosium-157	1000
66	Dysprosium-159	100
66	Dysprosium-165	1000
66	Dysprosium-166	100
67	Holmium-155	1000
67	Holmium-157	1000
67	Holmium-159	1000
67	Holmium-161	1000
67	Holmium-162	1000
67	Holmium-162m	1000
67	Holmium-164	1000
67	Holmium-164m	1000
67	Holmium-166	100
67	Holmium-166m	1
67	Holmium-167	1000
68	Erbium-161	1000
68	Erbium-165	1000
68	Erbium-169	100
68	Erbium-171	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
68	Erbium-172	100
69	Thulium-162	1000
69	Thulium-166	100
69	Thulium-167	100
69	Thulium-170	10
69	Thulium-171	10
69	Thulium-172	100
69	Thulium-173	100
69	Thulium-175	1000
70	Ytterbium -175	100
70	Ytterbium-162	1000
70	Ytterbium-166	100
70	Ytterbium-167	1000
70	Ytterbium-169	100
70	Ytterbium-177	1000
70	Ytterbium-178	1000
71	Lutetium-169	100
71	Lutetium-170	100
71	Lutetium-171	100
71	Lutetium-172	100
71	Lutetium-173	10
71	Lutetium-174	10
71	Lutetium-174m	10
71	Lutetium-176	100
71	Lutetium-176m	1000
71	Lutetium-177	100
71	Lutetium-177m	10
71	Lutetium-178	1000
71	Lutetium-178m	1000
71	Lutetium-179	1000
72	Hafnium- 170	100
72	Hafnium-172	1
72	Hafnium-173	1000
72	Hafnium-175	100
72	Hafnium-177m	1000
72	Hafnium-178m	0.1
72	Hafnium-179m	10
72	Hafnium-180m	1000
72	Hafnium-181	10
72	Hafnium-182	0.1
72	Hafnium-182m	1000
72	Hafnium-183	1000
72	Hafnium-184	100
73	Tantalum-172	1000
73	Tantalum-173	1000
73	Tantalum-174	1000
73	Tantalum-175	1000
73	Tantalum-176	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
73	Tantalum-177	1000
73	Tantalum-178	1000
73	Tantalum-179	100
73	Tantalum-180	100
73	Tantalum-180m	1000
73	Tantalum-182	10
73	Tantalum-182m	1000
73	Tantalum-183	100
73	Tantalum-184	100
73	Tantalum-185	1000
73	Tantalum-186	1000
74	Tungsten-176	1000
74	Tungsten-177	1000
74	Tungsten-178	1000
74	Tungsten-179	1000
74	Tungsten-181	1000
74	Tungsten-185	100
74	Tungsten-187	100
74	Tungsten-188	10
75	Rhenium-177	1000
75	Rhenium-178	1000
75	Rhenium-181	1000
75	Rhenium-182 (12.7 h)	1000
75	Rhenium-182 (64.0 h)	100
75	Rhenium-184	100
75	Rhenium-184m	10
75	Rhenium-186	100
75	Rhenium-186m	10
75	Rhenium-187	1000
75	Rhenium-188	100
75	Rhenium-188m	1000
75	Rhenium-189	100
76	Osmium-180	1000
76	Osmium-181	1000
76	Osmium-182	100
76	Osmium-185	100
76	Osmium-189m	1000
76	Osmium-191	100
76	Osmium-191m	1000
76	Osmium-193	100
76	Osmium-194	1
77	Iridium-182	1000
77	Iridium-184	1000
77	Iridium-185	1000
77	Iridium-186	100
77	Iridium-187	1000
77	Iridium-188	100
77	Iridium-189	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
77	Iridium-190	100
77	Iridium-190m	1000
77	Iridium-192	1
77	Iridium-192m (1.4 m)	100
77	Iridium-194	100
77	Iridium-194m	10
77	Iridium-195	1000
77	Iridium-195m	1000
78	Platinum-186	1000
78	Platinum-188	100
78	Platinum-189	1000
78	Platinum-191	100
78	Platinum-193	1000
78	Platinum-193m	100
78	Platinum-195m	100
78	Platinum-197	100
78	Platinum-197m	1000
78	Platinum-199	1000
78	Platinum-200	100
79	Gold-193	1000
79	Gold-194	100
79	Gold-195	10
79	Gold-198	100
79	Gold-198m	100
79	Gold-199	100
79	Gold-200	1000
79	Gold-200m	100
79	Gold-201	1000
80	Mercury-193	1000
80	Mercury-193m	100
80	Mercury-194	1
80	Mercury-195	1000
80	Mercury-195m	100
80	Mercury-197	1000
80	Mercury-197m	100
80	Mercury-199m	1000
80	Mercury-203	100
81	Thallium-194	1000
81	Thallium-194m	1000
81	Thallium-195	1000
81	Thallium-197	1000
81	Thallium-198	1000
81	Thallium-198m	1000
81	Thallium-199	1000
81	Thallium-200	1000
81	Thallium-201	1000
81	Thallium-202	100
81	Thallium-204	100

Atomic Number	Radionuclide	Quantity (μCi) [3]
82	Lead-195m	1000
82	Lead-198	1000
82	Lead-199	1000
82	Lead-200	100
82	Lead-201	1000
82	Lead-202	10
82	Lead-202m	1000
82	Lead-203	1000
82	Lead-205	100
82	Lead-209	1000
82	Lead-210	0.01
82	Lead-211	100
82	Lead-212	1
82	Lead-214	100
83	Bismuth-200	1000
83	Bismuth-201	1000
83	Bismuth-202	1000
83	Bismuth-203	100
83	Bismuth-205	100
83	Bismuth-206	100
83	Bismuth-207	10
83	Bismuth-210	1
83	Bismuth-210m	0.1
83	Bismuth-212	10
83	Bismuth-213	10
83	Bismuth-214	100
84	Polonium-203	1000
84	Polonium-205	1000
84	Polonium-207	1000
84	Polonium-210	0.1
85	Astatine-207	100
85	Astatine-211	10
86	Radon-220	1
86	Radon-222	1
87	Francium-222	100
87	Francium-223	100
88	Radium-223	0.1
88	Radium-224	0.1
88	Radium-225	0.1
88	Radium-226	0.1
88	Radium-227	1000
88	Radium-228	0.1
89	Actinium-224	1
89	Actinium-225	0.01
89	Actinium-226	0.1
89	Actinium-227	0.001
89	Actinium-228	1
90	Thorium-226	10

Atomic Number	Radionuclide	Quantity (μCi) [3]
90	Thorium-227	0.01
90	Thorium-228	0.001
90	Thorium-229	0.001
90	Thorium-230	0.001
90	Thorium-231	100
90	Thorium-232	100
90	Thorium-234	10
90	Thorium-natural	100
91	Protactinium-227	10
91	Protactinium-228	1
91	Protactinium-230	0.01
91	Protactinium-231	0.001
91	Protactinium-232	1
91	Protactinium-233	100
91	Protactinium-234	100
92	Uranium-230	0.01
92	Uranium-231	100
92	Uranium-232	0.001
92	Uranium-233	0.001
92	Uranium-234	0.001
92	Uranium-235	0.001
92	Uranium-236	0.001
92	Uranium-237	100
92	Uranium-238	100
92	Uranium-239	1000
92	Uranium-240	100
92	Uranium-natural	100
93	Neptunium 236 (22.5 h)	1
93	Neptunium-232	100
93	Neptunium-233	1000
93	Neptunium-234	100
93	Neptunium-235	100
93	Neptunium-236 (1.15E+5 y)	0.001
93	Neptunium-237	0.001
93	Neptunium-238	10
93	Neptunium-239	100
93	Neptunium-240	1000
94	Plutonium-234	10
94	Plutonium-235	1000
94	Plutonium-236	0.001
94	Plutonium-237	100
94	Plutonium-238	0.001
94	Plutonium-239	0.001
94	Plutonium-240	0.001
94	Plutonium-241	0.01
94	Plutonium-242	0.001
94	Plutonium-243	1000
94	Plutonium-244	0.001

Atomic Number	Radionuclide	Quantity (μCi) [3]
94	Plutonium-245	100
95	Americium-237	1000
95	Americium-238	100
95	Americium-239	1000
95	Americium-240	100
95	Americium-241	0.001
95	Americium-242	10
95	Americium-242m	0.001
95	Americium-243	0.001
95	Americium-244	10
95	Americium-244m	100
95	Americium-245	1000
95	Americium-246	1000
95	Americium-246m	1000
96	Curium-238	100
96	Curium-240	0.1
96	Curium-241	1
96	Curium-242	0.01
96	Curium-243	0.001
96	Curium-244	0.001
96	Curium-245	0.001
96	Curium-246	0.001
96	Curium-247	0.001
96	Curium-248	0.001
96	Curium-249	1000
97	Berkelium-245	100
97	Berkelium-246	100
97	Berkelium-247	0.001
97	Berkelium-249	0.1
97	Berkelium-250	10
98	Californium-244	100
98	Californium-246	1
98	Californium-248	0.01
98	Californium-249	0.001
98	Californium-250	0.001
98	Californium-251	0.001
98	Californium-252	0.001
98	Californium-253	0.1
98	Californium-254	0.001
99	Einsteinium-250	100
99	Einsteinium-251	100
99	Einsteinium-253	0.1
99	Einsteinium-254	0.01
99	Einsteinium-254m	1
100	Fermium-252	1
100	Fermium-253	1
100	Fermium-254	10
100	Fermium-255	1

Atomic Number	Radionuclide	Quantity (μCi) [3]
100	Fermium-257	0.01
101	Mendelevium-257	10
101	Mendelevium-258	0.01
	Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.001
	Any radionuclide other than alpha emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition	0.01

[1] For purposes of He-P 4022.11(e), He-P 4022.14(a), and He-P 4021.12(b), where there is involved a combination of radionuclides in known amounts, the limit for the combination shall be derived by determining for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed "one".

[2] The quantities listed above were derived by taking 1/10th of the most restrictive ALI listed in He-P 4090, Table 4090.1, Table I, Columns 1 and 2, of He-P 4090, rounding to the nearest factor of 10, and constraining the values listed between 37 Bq and 37 MBq (0.001 and 1000 μCi). Values of 3.7 MBq (100 μCi) have been assigned for radionuclides having a radioactive half-life in excess of E+9 years, except rhenium, 37 MBq (1000 μCi), to take into account their low specific activity.

[3] To convert μCi to kBq, multiply the μCi value by 37.

Appendix

Rule	**State or Federal Statute or Federal Regulation Implemented**
He-P 4062.01 – 4062.03	RSA 125-F:5, IV&V; RSA 125-F:7, II-IV
He-P 4091.01- He-P 4091.03	RSA 125-F:5, V
He-P 4092.01	RSA 125-F:5, V