

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

① 3210

318478

Licensee

1. Essential Isotopes

2. 1513 Research Park Drive
Columbia, MO 65211

3. License number 24-32762-02

4. Expiration date August 31, 2021

5. Docket No. 030-38132
Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Fluorine-18	A. Any	A. 20 curies
B. Carbon-11	B. Any	B. 2 curies
C. Nitrogen-13	C. Any	C. 2 curies
D. Oxygen-15	D. Any	D. 1 curie
E. Indium-111	E. Any	E. 100 millicuries
F. Copper-64	F. Any	F. 1 curie
G. Gallium-68	G. Any	G. 200 millicuries
H. Any byproduct material with atomic numbers 1 through 83.	H. Incidentally Activated Products	H. 20 millicuries per nuclide, 1 curie total possession limit
I. Cobalt-60	I. Incidentally Activated Products	I. 50 millicuries
J. Manganese-54	J. Incidentally Activated Products	J. 100 millicuries
K. Cadmium-109	K. Incidentally Activated Products	K. 100 millicuries
L. Cobalt-57	L. Incidentally Activated Products	L. 10 millicuries
M. Cesium-137	M. Incidentally Activated Products	M. 300 microcuries

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

24-32762-02

Docket or Reference Number

030-38132

9. Authorized use:

A. through G. (1) For production, possession, or handling of radiochemicals for transfer to persons authorized to receive the licensed material pursuant to the terms and conditions of a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State.

(2) For packaging and distribution of produced radiochemicals to persons authorized to receive licensed materials pursuant to the terms and conditions of specific licenses issued by the Nuclear Regulatory Commission or Agreement States. This should not be distributed as a radiopharmaceutical or radioactive drug.

H. through K. For possession and storage of byproduct materials incidental to radionuclide production.

L. and M. Calibration and checking of the licensee's instruments.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at 1513 Research Park Drive Columbia, Missouri.
11. The Radiation Safety Officer for this license is Ronald Dobey, CHP.
12. Licensed material shall be used by, or under the supervision of, Marc Weichelt, R.Ph., Scott C. Brower, R.Ph., William Brent McHugh, R.Ph., Jon Woodward, R.Ph., or Lawrence Saale.
13. This license does not authorize distribution pursuant to 32.72 or 32.74; to persons exempt from licensing; or to general licensees.
14.
 - A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement State
 - B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement State prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested and the test results received.
 - C. Sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
24-32762-02Docket or Reference Number
030-38132

- D. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 Becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 Becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.
- E. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.
15. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee, except as specifically authorized.
16. The licensee shall conduct a physical inventory every six months, or at other intervals approved by the U.S. Nuclear Regulatory Commission, to account for all sources and/or devices received and possessed under the license.
17. The licensee is authorized to hold byproduct material with a physical half-life of less than or equal to 120 days from decay-in-storage before disposal without regard to its radioactivity if the licensee:
- A. Monitors byproduct material at the surface before disposal and determines that its radioactivity cannot be distinguished from the background radiation level with an appropriate radiation detection survey meter set on its most sensitive scale and with no interposed shielding;
 - B. Removes or obliterates all radiation labels, except for radiation labels on materials that are within containers and that will be managed as biomedical waste after they have been released from the licensee;
 - C. Maintains records of the disposal of licensed materials for 3 years. The record must include the date of the disposal, the survey instrument used, the background radiation level, the radiation level measured at the surface of each waste container, and the name of the individual who performed the disposal.
18. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
19. The licensee shall provide acceptable decommissioning financial assurance (DFA) as required by 10 CFR Part 30, Section 30.35. The licensee shall submit DFA progress reports to the U.S. Nuclear Regulatory Commission, Region III, Attention: Chief, Nuclear Materials Licensing Branch, 2443 Warrenville Road, Suite 210, Lisle, Illinois 60532 to update the NRC on the status of their DFA. The licensee shall submit DFA progress reports every 30 days until such time that DFA is submitted to the NRC for review. If the NRC determines that the DFA is not acceptable, the licensee shall continue to submit DFA progress reports every 30 days until acceptable DFA is provided to the NRC.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
24-32762-02Docket or Reference Number
030-38132

20. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

B. Application dated August 10, 2009; and

C. Letters dated April 15, 2010, and October 22, 2010.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date AUG 31 2011 By Kevin G. Null Kevin G. Null
Materials Licensing Branch
Region III