

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, 37, 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.

<p style="text-align: center;">Licensee</p> <p>1. United States Department of the Interior U. S. Geological Survey</p> <p>2. Columbia Environmental Research Center 4200 E. New Haven Road Columbia, Missouri 65201</p>	<p>In accordance with letter dated April 1, 2015,</p> <p>3. License No. 24-12728-01 is amended in its entirety to read as follows:</p> <p>4. Expiration Date: September 30, 2015</p> <p>5. Docket No. 030-05146 Reference No.</p>
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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. Hydrogen-3	A. Any	A. 30 millicuries
B. Carbon-14	B. Any	B. 50 millicuries
C. Phosphorus-32	C. Any	C. 5 millicuries
D. Iodine-131	D. Any	D. 5 millicuries
E. Iodine-125	E. Any	E. 10 millicuries
F. Strontium-85	F. Any	F. 10 millicuries
G. Selenium-75	G. Any	G. 10 millicuries
H. Mercury-203	H. Any	H. 10 millicuries
I. Phosphorus-33	I. Any	I. 5 millicuries
J. Hydrogen-3	J. Foil in detector cells (which have been evaluated by and registered with the NRC of Agreement State)	J. Not to exceed 250 millicuries per foil. Total activity 214 millicuries.
K. Nickel-63	K. Foil in detector cells (which have been evaluated by and registered with the NRC of Agreement State)	K. Not to exceed 15 millicuries per foil. Total activity 124 millicuries.

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9. Authorized Use:

- A. through I. For use in tracer studies in fish and other aquatic organisms.
- J. and K. For use in gas chromatographs for sample analysis.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at Columbia Environmental Research Center, 4200 E. New Haven Road, Columbia, Missouri.
11. **The Radiation Safety Officer (RSO) for this license is Frank Proa.**
12. Licensed materials shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Officer, **Frank Proa.**
13. Licensed material shall not be used in or on humans except as provided otherwise by specific condition of this license.
14. The licensee shall not use licensed material in field applications where activity is release except as provided otherwise by specific condition of this license.
15. Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.
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. Records of inventories shall be maintained for five years from the date of each inventory, and shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.
17. Maintenance, repair, cleaning, replacement, and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.
18. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
19. The licensee shall not acquire licensed material in a sealed source or device that contains a sealed source unless the source or device has been registered with the U. S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.

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20. 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 the U. S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of 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 the U. S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement state, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.
- C. Sealed sources need not be leak tested if they contain only hydrogen-3; or they contain only a radioactive gas; or the half-life of the isotope is 30 days or less; or they contain no more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material.
- D. 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.
- E. 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.
- F. Tests for leakage and/or contamination, limited to leak test sample collection, 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.
- G. Records of leak test results shall be kept in units of microcuries and shall be maintained for three years.
21. 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."

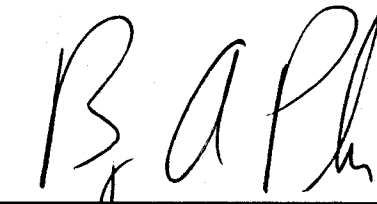
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22. The licensee is authorized to hold radioactive material with a physical half-life of less than or equal to 120 days for decay-in-storage before disposal in ordinary trash provided:
- A. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
 - B. A record of each disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in the storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
23. 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.
- A. Application dated March 28, 2005 (ML050890438)
 - B. Letter dated July 15, 2010 (ML101970237)
 - C. Letter dated April 2, 2012 (ML12094A362)
 - D. Letter dated April 10, 2012 (ML12116A091)
 - E. Letter dated January 23, 2014 (ML14024A188)
 - F. Letter dated February 12, 2014 (ML14043A317)
 - G. **Letter dated April 30, 2015 (ML15174A106)**

FOR THE U. S. NUCLEAR REGULATORY COMMISSION

Date OCT 01 2015

By

Bryan A. Parker
Materials Licensing Branch
Region III