U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 29

# 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.

| Licensee | In accordance with the letter dated January 21, 2013, |
|---|---|
| 1. The President and Fellows of Middlebury College | 3. License number 44-08056-03 is amended in its entirety to read as follows: |
| 2. Middlebury, Vermont 05753 | 4. Expiration date February 28, 2015 |
| | 5. Docket No. 030-09366<br>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. Hydrogen 3 | A. Any | A. 250 millicuries |
| B. Carbon 14 | B. Any | B. 50 millicuries |
| C. Sodium 24 | C. Any | C. 1 millicuries |
| D. Phosphorus 32 | D. Any | D. 10 millicuries |
| E. Phosphorus 33 | E. Any | E. 10 millicuries |
| F. Sulfur 35 | F. Any | F. 100 millicuries |
| G. Calcium 45 | G. Any | G. 1 millicuries |
| H. Manganese 54 | H. Any | H. 1 millicuries |
| I. Iron 55 | I. Any | I. 1 millicuries |
| J. Rubidium 86 | J. Any | J. 1 millicuries |
| K. Iodine 125 | K. Prepackaged Kits | K. 5 millicuries |
| L. Californium 252 | L. Sealed Neutron Source (U.S. DOE Model SR-CF-100 series) | L. 1 millicurie per source and 1 millicurie total |
| M. Strontium 90 | M. Sealed Source (Eckert & Ziegler Model SIF-D1) | M. 100 millicuries per source and 200 millicuries total |

9. Authorized use:

A. through M. Research and development as defined in 10 CFR 30.4; animal studies; teaching and training of students.

CONDITIONS

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10. Licensed material may be used or stored only at the licensee's facilities located at McCardell Bicentennial Hall, Middlebury College, Middlebury, Vermont.

11. A. Licensed material shall be used by, or under the supervision of:

| Authorized Users | Material |
|---|---|
| Timothy W. Allen | Hydrogen-3, Carbon-14, Sodium-24, Phosphorus-32, Phosphorus-33, Sulfur-35, Calcium-45, Manganese-54, Iron-55, Rubidium-86, Iodine-125, and Californium-252 |
| William H. Amidon, Ph.D. | Strontium-90 |
| Robert G. Cluss, Ph.D. | Hydrogen-3, Carbon-14, Sodium-24, Phosphorus-32, Phosphorus-33, Sulfur-35, Calcium-45, Manganese-54, Iron-55, Rubidium-86, and Iodine-125 |
| Catherine Combelles, Ph.D. | Hydrogen-3, Carbon-14, Phosphorus-32, Phosphorus-33, and Sulfur-35 |
| Susan DeSimone, Ph.D. | Hydrogen-3, Carbon-14, Phosphorus-32, Phosphorus-33, Sulfur-35, and Iodine-125, |
| Jeffrey S. Dunham | Californium-252 |
| Grace Spatafora, Ph.D. | Hydrogen-3, Carbon-14, Sodium-24, Phosphorus-32, Phosphorus-33, Sulfur-35, Calcium-45, Manganese-54, Iron-55, Rubidium-86, and Iodine-125 |
| Mark D. Spritzer, Ph.D. | Iodine-125 |
| Jeremy Ward, Ph.D. | Hydrogen-3, Carbon-14, Phosphorus-32, Phosphorus-33, Sulfur-35, and Iodine-125 |
| Christopher Watters, Ph.D | Hydrogen-3, Carbon-14, Sodium-24, Phosphorus-32, Phosphorus-33, Sulfur-35, Calcium-45, Manganese-54, Iron-55, Rubidium-86, and Iodine-125 |

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| Authorized Users | Material |
|---|---|
| Timothy Wickland | Hydrogen-3, Carbon-14, Sodium-24, Phosphorus-32, Phosphorus-33, Sulfur-35, Calcium-45, Manganese-54, Iron-55, Rubidium-86, Iodine-125, and Californium-252 |
| Roger Sandwick, Ph.D. | Hydrogen-3, Carbon-14, Phosphorus-33, and Sulfur-35 |

B. The Radiation Safety Officer for this license is Timothy Wickland.

12. The licensee shall not use licensed material in or on human beings except as provided otherwise by specific condition of this license.

13. The licensee shall not use licensed material in field applications where it is released except as provided otherwise by specific condition of this license.

14. Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.

15. 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 5 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.

16. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed six months or at 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 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.

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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.

F. Records of leak test results shall be kept in units of microcuries and shall be maintained for 5 years.

17. The licensee is authorized to hold byproduct material with a physical half-life of less than or equal to 120 days for 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; and

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; and

C. Maintains records of the disposal of licensed materials for 3 years. The record must include the date of 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 in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

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19. 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 October 22, 2004 [ML043100044]
B. Letter dated January 21, 2013 [ML1302A529]
C. Letter dated April 22, 2013 [ML13112A821]

For the U.S. Nuclear Regulatory Commission

Date April 24, 2013

By ***Original signed by Farrah C. Gaskins***

Farrah C. Gaskins
Commercial and R&D Branch
Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406