

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.

<p style="text-align: center;">Licensee</p> <p>1. Marshall University</p> <p>2. Room 301J University Radiation Safety Office Robert C. Byrd Biotechnology Science Center One John Marshall Drive Huntington, West Virginia 25755-2505</p>	<p>In accordance with the letter dated April 9, 2009,</p> <p>3. License number 47-05972-02 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date May 31, 2015</p> <hr/> <p>5. Docket No. 030-01142 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. As specified in Section 33.100, Schedule A of 10 CFR 33 (Type B Broad License)</p> <p>B. Americium 241</p> <p>C. Hydrogen 3</p> <p>D. Cobalt 57</p> <p>E. Cobalt 60</p> <p>F. Barium 133</p> <p>G. Iodine 129</p> <p>H. Radium 226</p> <p>I. Americium 241</p> <p>J. Nickel 63</p>	<p>7. Chemical and/or physical form</p> <p>A. Any</p> <p>B. Any</p> <p>C. Titanium tritide vacuum deposited on tantalum or copper backing</p> <p>D. Sealed Sources (Bristol-Myers Squibb Medical Imaging Model NES-206)</p> <p>E. Sealed Sources (ICN Model No. ICN375)</p> <p>F. Sealed Sources (Bristol-Myers Squibb Medical Imaging Model No. NES-358)</p> <p>G. Sealed Source</p> <p>H. Sealed Source (Atomic Accessories Model 217, N5 445)</p> <p>I. Sealed Source</p> <p>J. Foils or Plated Source in detector cells registered per 10 CFR 32.210 or an equivalent Agreement State</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. See Condition 15</p> <p>B. 6 microcuries</p> <p>C. 5 curies</p> <p>D. 6 millicuries per source and 12 millicuries total</p> <p>E. 18 millicuries</p> <p>F. 1 millicurie</p> <p>G. 0.2 microcuries</p> <p>H. 5 millicuries</p> <p>I. 5 millicuries</p> <p>J. 225 millicuries</p>
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SUPPLEMENTARY SHEET**

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| 6. Byproduct, source, and/or special nuclear material | 7. Chemical and/or physical form regulation       | 8. Maximum amount that licensee may possess at any one time under this license |
| K. Cesium 137   | K. Sealed Source (AEA Model No. 77302)            | K. 165 millicuries   |
| L. Cesium 137   | L. Sealed Source (U.S. Nuclear Model No. ICN375)  | L. 100 millicuries   |
| M. Radium 226   | M. Sealed Source (Canadian Radium & Uranium Corp) | M. 1 millicurie  |

9. Authorized use:

- A. through I. Research and development as defined in 10 CFR 30.4; teaching and training of students; and calibration and checking of the licensee's instruments.
- J. To be used for sample analysis in compatible gas chromatography devices that have been registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State and have been distributed in accordance with a Commission or Agreement State specific license authorizing distribution to persons specifically authorized by a Commission or Agreement State license to receive, possess, and use the devices.
- K. For use in a Amersham Corporation Model 773 calibrator for calibrations and checking of licensee's survey instruments.
- L. For use in a J.L. Shepherd Model 28-5 calibrator for calibrations and checking of licensee's survey instruments.
- M. Calibration of the licensee's instruments.

**CONDITIONS**

10. Licensed material may be used or stored only at the licensee's facilities located at Marshall University, Huntington, West Virginia.
11. Licensed material shall be used by or under the supervision of individuals designated, in writing, by the Radiation Safety Officer. The licensee shall maintain records of individuals designated as users for 3 years following the last use of licensed material by the individual.
12. The Radiation Safety Officer for this license is William D. McCumbee, Ph.D.
13. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of unsealed byproduct material to quantities less than  $10^5$  of the applicable limits in Appendix B of 10 CFR Part 30, as specified in 10 CFR 30.35(d).

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14. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of sealed byproduct material to quantities less than  $10^{10}$  of the applicable limits in Appendix B of 10 CFR Part 30, as specified in 10 CFR 30.35(d).
15. If only one radionuclide is possessed, the possession limit is the quantity specified for that radionuclide in 10 CFR 33.100, Schedule A, Column I. If two or more radionuclides are possessed, the possession limit is determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in 10 CFR 33.100, Schedule A, Column I, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.
16. The licensee shall not use licensed material in or on human beings.
17. The licensee shall not use licensed material in field applications where it is released except as provided otherwise by specific condition of this license.
18. 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. Notwithstanding Paragraph A of this Condition, sealed sources designed to primarily emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- D. 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.
- E. Sealed sources need not be 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 not more than 100 microcuries of beta- and/or gamma-emitting material or not more than 10 microcuries of alpha-emitting material.
- F. 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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- G. 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.
- H. 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.
- I. Records of leak test results shall be kept in units of microcuries and shall be maintained for 5 years.
19. A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperatures from exceeding that specified in the certificate of registration referred to in 10 CFR 32.210.
- B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.
20. 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.
21. 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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22. 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 December 6, 2004 (ML050140370)
  - B. Letter dated January 31, 2005 (ML050340168)
  - C. Letter dated October 23, 2006 (ML063170497)



For the U.S. Nuclear Regulatory Commission

Date April 27, 2009

By

***Original signed by Dennis R. Lawyer***

Dennis R. Lawyer  
Commercial and R&D Branch  
Division of Nuclear Materials Safety  
Region I  
King of Prussia, Pennsylvania 19406