

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, 70 and 71, 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>Licensee</p> <p>1. American Radiolabeled Chemicals, Inc.</p> <p>2. 101 Arc Dr. St. Louis, MO 63146</p>	<p>In accordance with letter dated December 19, 2018.</p> <p>3. License number: 24-21362-01 is amended in its entirety to read as follows:</p>	<p>4. Expiration Date: December 31, 2033</p> <p>5. Docket No.: 030-20567 Reference No.:</p>
<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Carbon-14</p>	<p>7. Chemical and/or physical form</p> <p>A. Any Except Sealed Sources</p> <p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 400 curies total</p>	<p>9. Authorized use</p> <p>A. For possession, use, and processing incident to manufacture and synthesis of radiolabeled chemicals for distribution to persons authorized to receive the licensed material under the terms of a specific license issued by the Commission or an Agreement State. For possession incident to outdoor site construction and site beautification activities involving movement of site soils, radiological site characterization, collection and analysis of water and soil samples containing residual contamination. For possession incident to distribution of labeled compounds in accordance with NRC license Number 24-21362-02E.</p>

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SUPPLEMENTARY SHEET**License Number
24-21362-01Docket or Reference Number
030-20567

Amendment No. 58

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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 | 9. Authorized use |
| B. Hydrogen-3 | B. Any Except Sealed Sources | B. 14000 curies total | B. Same as Subitem No. 9.A. |
| C. Iodine-125 | C. Any Except Sealed Sources | C. 1.5 curies total | C. For possession, use, and processing incident to manufacture and synthesis of radiolabeled chemicals for distribution to persons authorized to receive the licensed material under the terms of a specific license issued by the Commission or an Agreement State. For possession incident to outdoor site construction and site beautification activities involving movement of site soils, radiological site characterization, collection and analysis of water and soil samples containing residual contamination. |
| D. Phosphorus-32 | D. Any Except Sealed Sources | D. 1 curie total | D. Same as Subitem No. 9.C. |
| E. Phosphorus-33 | E. Any Except Sealed Sources | E. 1 curie total | E. Same as Subitem No. 9.C. |
| F. Sulfur-35 | F. Any Except Sealed Sources | F. 10 curies total | F. Same as Subitem No. 9.C. |
| G. Calcium-45 | G. Any Except Sealed Sources | G. 1 curie total | G. Same as Subitem No. 9.C. |
| H. Chlorine-36 | H. Any Except Sealed Sources | H. 0.3 curies total | H. Same as Subitem No. 9.C. |
| I. Chromium-51 | I. Any Except Sealed Sources | I. 0.2 curies total | I. Same as Subitem No. 9.C. |

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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 | 9. Authorized use |
| J. Iron-59 | J. Prepackaged Kits | J. 0.1 curies total | J. For redistribution to persons authorized to receive the licensed material under the terms of a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State. |
| K. Strontium-85 | K. Prepackaged Kits | K. 0.1 curies total | K. Same as Subitem No. 9.J. |
| L. Cobalt-60 | L. Prepackaged Kits | L. 0.1 curies total | L. Same as Subitem No. 9.J. |
| M. Iron-55 | M. Prepackaged Kits | M. 0.1 curies total | M. Same as Subitem No. 9.J. |
| N. Sodium-22 | N. Prepackaged Kits | N. 0.1 curies total | N. Same as Subitem No. 9.J. |
| O. Zinc-65 | O. Prepackaged Kits | O. 0.1 curies total | O. Same as Subitem No. 9.J. |
| P. Iodine-131 | P. Prepackaged Kits | P. 0.1 curies total | P. Same as Subitem No. 9.J. |
| Q. Iron-55 | Q. Any Except Sealed Sources | Q. 10 millicuries total | Q. For possession, use, and processing incident to manufacture and synthesis of radiolabeled chemicals for distribution to persons authorized to receive the licensed material under the terms of a specific license issued by the Commission or an Agreement State. |
| R. Iron-59 | R. Any Except Sealed Sources | R. 10 millicuries total | R. Same as Subitem No. 9.Q. |

CONDITIONS

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10. Licensed material may be used or stored at the licensee's facilities located at:
- A. 104 ARC Dr., St. Louis, Missouri, 63146
 - B. 100 ARC Dr., St. Louis, Missouri, 63146
11. The Radiation Safety Officer (RSO) for this license is Jeffrey S. Vollmer, CHP.
12. A. Licensed material listed in Subitem Nos. 6.A. through 6.R. shall be used by, or under the supervision of individuals designated as Authorized Users for Non-medical use:
- B. Individuals designated for non-medical use, under the license:
- | <u>Authorized Users</u> | <u>Material and Use</u> |
|---------------------------------|-------------------------|
| Kamal Das, Ph.D. | All |
| Surendra K. Gupta, Ph.D. | All |
| Janardhanam Selvasekaran, Ph.D. | All |
13. This license does not authorize commercial distribution of licensed material to persons generally licensed pursuant to 10 CFR Part 31 or to persons exempt from licensing pursuant to 10 CFR 30.18.
14. The licensee shall not use the licensed material in or on humans.
15. The licensee shall not use licensed material in field applications where activity is released except as provided otherwise by specific condition of this license.

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16. 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, 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.
 - B. A record of each such disposal permitted under this license condition shall be retained for 3 years. The record must include the date of disposal, the date on which the byproduct material was placed in 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.
17. Radioactive Waste - as Surface Contaminated Objects - possessed under this license shall be stored in accordance with the statements, representations, and procedures included with the licensee's letter dated December 7, 2018 (ML18344A094).
18. 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. This license condition applies only to those procedures that are required to be submitted in accordance with the regulations. 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 June 13, 2018 (ML18166A321)
 - B. Letter dated December 7, 2018 (ML18344A094)
 - C. Letter dated August 2, 2013 (ML13217A231)
 - D. Letter dated August 23, 2013 (ML13239A193)
 - E. Letter dated October 30, 2013 excluding items 1, 2, and 3 (ML13304B988)

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- F. Letter dated December 31, 2013 including attached e-mail dated December 10, 2013, with regard to the effective radius of the nozzle exit velocity for the effluent stack in building 300 (ML14007A685)
- G. Letter dated August 1, 2014 (ML14218A761)
- H. Letter dated November 14, 2014 (ML14322A794)
- I. Letter dated January 15, 2015 (ML15035A362)



FEB 07 2019

Date: _____

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

By: Bryan A. Parker
Bryan A. Parker
Region 3