**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.

<table>
<thead>
<tr>
<th>Licensee</th>
<th>In accordance with letter dated October 26, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Texas A&amp;M University</td>
<td>3. License number 42-09082-09 is amended in its entirety to read as follows:</td>
</tr>
<tr>
<td>2. 4472 TAMU College Station, Texas 77843-4472</td>
<td>4. Expiration date April 30, 2018</td>
</tr>
<tr>
<td>5. Docket No. 030-01066</td>
<td>8. Maximum amount that licensee may possess at any one time under this license</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Byproduct, source, and/or special nuclear material</th>
<th>7. Chemical and/or physical form</th>
<th>N. Sealed sources (Isotope Products Laboratories or AEA Technology custom plated sources; QSA Global Model NBCD; or Eckert &amp; Ziegler Isotope Products Model NER-004P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Carbon-14</td>
<td>A. Any</td>
<td>A. 50 millicuries total</td>
</tr>
<tr>
<td>B. Sulfur-35</td>
<td>B. Any</td>
<td>B. 20 millicuries total</td>
</tr>
<tr>
<td>C. Calcium-45</td>
<td>C. Any</td>
<td>C. 100 millicuries total</td>
</tr>
<tr>
<td>D. Cesium-134</td>
<td>D. Any</td>
<td>D. 1 millicurie total</td>
</tr>
<tr>
<td>E. Hydrogen-3</td>
<td>E. Any</td>
<td>E. 100 millicuries total</td>
</tr>
<tr>
<td>F. Phosphorus-32</td>
<td>F. Any</td>
<td>F. 50 millicuries total</td>
</tr>
<tr>
<td>G. Phosphorus-33</td>
<td>G. Any</td>
<td>G. 10 millicuries total</td>
</tr>
<tr>
<td>H. Neptunium-237</td>
<td>H. Any</td>
<td>H. 1 microcurie total</td>
</tr>
<tr>
<td>I. Thorium-228</td>
<td>I. Any</td>
<td>I. 1 microcurie total</td>
</tr>
<tr>
<td>J. Thorium-232</td>
<td>J. Any</td>
<td>J. 1 microcurie total</td>
</tr>
<tr>
<td>K. Thorium-234</td>
<td>K. Any</td>
<td>K. 10 microcuries total</td>
</tr>
<tr>
<td>L. Plutonium-240</td>
<td>L. Any</td>
<td>L. 1 microcurie total</td>
</tr>
<tr>
<td>M. Plutonium-242</td>
<td>M. Any</td>
<td>M. 1 microcurie total</td>
</tr>
<tr>
<td>N. Nickel-63</td>
<td>N. Sealed sources (Isotope Products Laboratories or AEA Technology custom plated sources; QSA Global Model NBCD; or Eckert &amp; Ziegler Isotope Products Model NER-004P)</td>
<td>N. 15 millicuries per source and 60 millicuries total</td>
</tr>
</tbody>
</table>
MATERIALS LICENSE
SUPPLEMENTARY SHEET

6. Byproduct, source, and/or special nuclear material
   O. Cesium-137
   P. Europium-152

7. Chemical and/or physical form
   O. Sealed sources (Isotope Products Laboratories Model HEG-137; QSA Global Model CDC.800 Series; or Eckert & Ziegler Isotope Products Model Cs7.P03)
   P. Sealed sources (Isotope Products Laboratories Model GF-XXX Type R Series)

8. Maximum amount that licensee may possess at any one time under this license
   O. 10 millicuries per source and 40 millicuries total
   P. 10 microcuries per source and 20 microcuries total

9. Authorized Use:
   A. through M. For research and development as defined in 10 CFR 30.4, in vitro studies, and educational purposes. Studies in animals are not authorized.
   N. To be used for sample analysis in compatible gas chromatography devices that have been registered either with NRC under 10 CFR 32.210 or with an Agreement State and have been distributed in accordance with an NRC or Agreement State specific license authorizing distribution to persons specifically authorized by an NRC or Agreement State license to receive, possess, and use the devices.
   O. For use in gamma ray attenuators and density evaluators to measure by transmission methods the density of ocean cores.
   P. For energy calibrations of NaI(Tl) detectors used in core logging

10. Licensed material shall be stored or used only at the licensee's facilities located:
    A. Aboard any Texas A&M University research vessel, or aboard other ships under contract between Texas A&M University and the ship's owner, for in vitro tracer studies at temporary job sites of the licensee in offshore waters where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material, and
    B. Temporary job sites anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material, including areas of exclusive Federal jurisdiction within Agreement States.

   If the jurisdiction status of a Federal facility within an Agreement state is unknown, the licensee should contact the federal agency controlling the job site in question to determine whether the proposed job site is an area of exclusive Federal jurisdiction. Authorization for use of radioactive materials at job sites in Agreement States not under exclusive Federal jurisdiction shall be obtained from the appropriate state regulatory agency.
11. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiological Safety Committee, John W. Poston, Ph.D., Chairperson.

12. The Radiation Safety Officer (RSO) for this license is Latha Vasudevan, Ph.D., CHP.

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by an Agreement State.

B. Notwithstanding Paragraph A of this Condition, sealed sources and detector cells designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. 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 by an Agreement State, prior to the transfer a sealed source and/or detector cell received from another person shall not be put into use until tested and the test results received.

D. 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.

E. Sealed sources and detector cells 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 and detector cells 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 and/or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

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. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV, 1600 East Lamar Boulevard, Arlington, Texas 76011-4511; ATTN: Director, Division of Nuclear Materials Safety. The report shall specify the source involved, the test results, and corrective action taken.

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.
14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

15. 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.

16. Sealed sources shall not be subjected to environmental or other conditions of use that exceed the statement of "Limitations and/or Other Considerations of Use," or the classification testing described in the corresponding sealed source and device registration certificate.

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

18. 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 temperature from exceeding that specified by the manufacturer and approved by U.S. Nuclear Regulatory Commission.

B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.

19. This license does not authorize disposal of licensed material at sea.

20. The licensee shall not use licensed material in field applications where activity is released to the environment except as provided otherwise by specific condition of this license.

21. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.

22. This license does not authorize commercial distribution of licensed material.

23. The licensee shall conduct a physical inventory every 6 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.

24. 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 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.

25. The licensee shall maintain records of information related to decommissioning as specified in 10 CFR 30.35(g) until this license is terminated by the Commission.

26. 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.”

27. 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 29, 2007 (ML070340121)
B. Email dated April 22, 2008 (ML081140284)

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: January 6, 2016

By: Roberto J. Torres, M.S., Senior Health Physicist
   Nuclear Materials Safety Branch B
   Region IV
   Arlington, Texas 76011-4511