RHS 8-7

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH
William R. Snodgrass TN Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, TN 37243
615-532-0364

RADIOACTIVE MATERIAL LICENSE

Amendment 107

Pursuant to Tennessee Department of Environment and Conservation Regulations, 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 radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules and regulations of the Tennessee Department of Environment and Conservation and orders of the Division of Radiological Health, now or hereafter in effect and to any conditions specified below.

LICENSEE	3. License number
1. Name: Diversified Scientific Services, Inc. (DSSI)	R-73014-H24
	4. Expiration date: August 31, 2024
2. Address: 657 Gallaher Road, Kingston, Tennessee 37763	5. File no.: R-73014

6. Radioactive Material (Element and Mass Number)	8. Chemical and/or physical form	9. Maximum Radioactivity and/or quantity of material which licensee may possess at any one time.
SEE SUPPLEMENTARY SHEETS		

10. Authorized Use

SEE SUPPLEMENTARY SHEETS

CONDITIONS

11. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

For the Commissioner
Tennessee Department of Environment and Conservation

Date of Issuance: June 15, 2018

By: Charles Arnott
Division of Radiological Health
Charles Arnott, Environmental Consultant

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6. Radioactive Material (Element and Mass Number)	8. Chemical and/or Physical Form	9. Maximum Radioactivity and/or Quantity of Material Which Licensee May Possess at Any One Time
A. Hydrogen 3	A. Any liquids or solids for operations authorized in Item 10 of this license and for treatment as out- lined in the License Operational Criteria. (Hazardous constituents shall be authorized by the facility's appropriate RCRA Hazardous Waste Permit(s) issued by the State of Tennessee, Division of Solid Waste Management, and/or TSCA Hazardous Waste Permit(s) issued by the US EPA)	A. 20000 Curies
B. Carbon 14	B. Same as in 8.A.	B. 300 Curies
C. Any Radioactive Material with Atomic Numbers 1 through 83, inclusive, except Hydrogen 3 and Carbon 14.	C. Same as in 8.A.	C. The total combined isotopic activities shall not exceed 20 Curies at any one time.
D. Any Radioactive Material with Atomic Numbers 84 through 92, inclusive, except special nuclear	D. Same as in 8.A.	D. The total combined isotopic activities shall not exceed 10 Curies at any one time.

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material.

E.	Transuranics, except special nuclear material.	E. Same as in 8.A.	E. Total not to exceed 100 millicuries.
F.	Uranium (not U-233 or U-235)	F. Same as in 8.A.	F. Total quantity authorized in Items F. and G. is 3000 kilograms.
G.	Thorium	G. Same as in 8.A.	G. See Item 9.F.
H.	Uranium 233	H. Same as in 8.A.	H. 175 grams (see Note 1 below)
I.	Uranium enriched in the U-235 isotope	I. Same as in 8.A.	I. 350 grams of contained U-235 (see Note 1 below)
J.	Plutonium	J. Same as in 8.A.	J. 200 grams (see Note 1 below)
K.	Any Radioactive Material with Atomic Numbers 1 through 95, inclusive, except special nuclear material.	K. Sealed Source in plated, encapsulated, embedded, or flame sealed (liquid) form. Liquid radioactive standards.	K. No single source to exceed 100 microcuries. Total not to exceed one 1 millicurie.
L.	Nickel 63	L. Sealed Source (Any source used in electron capture detectors as part of a gas chromatograph authorized by the NRC Sealed Source and Device Registry)	L. Six (6) sources not to exceed twenty (20) millicuries each or the maximum amount authorized by the NRC Sealed Source and Device Registry.

Note:

(1) For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified here for the same kind of special nuclear material. The sums of such ratios for all kinds of special nuclear material in combination shall not exceed "1" (i.e., unity).

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10. Authorized Use

A. through J. In accordance with statements, and representations, and procedures contained in material referenced in conditions of this license:

1. For treatment as solids, liquids, or gases; and/or
2. For the burning as radioactive liquids with suspended or dissolved solids; and
3. Storage and processing of the resultant site-generated waste.
4. Shredding, compacting, and stabilization operations of on-site and/or commercially generated radioactive wastes.
5. Laboratory analysis of samples.
6. Waste receipt, unpacking, sorting and/or separating, repackaging, storage, and transfer of radioactive material for processing at a facility affiliated or unaffiliated with DSSI
7. Possession or receipt as contaminates on equipment.
8. Macroencapsulation
9. Elemental Mercury Amalgamation/Stabilization
10. Decontamination and Survey for Unrestricted Release
11. Processing of sealed and unsealed sources

K. For use in instrument calibration and standardization. For use in analytical method development, method verification and quality control.

L. For use in electron capture detectors as part of gas chromatographs authorized by the NRC Sealed Source and Device Registry.

Conditions

12. The licensee shall comply with applicable provisions of 0400-20-04, 0400-20-05, 0400-20-10, and 0400-20-13 of "State Regulations for Protection Against Radiation."

13. Radioactive material authorized by this license shall be used only at 657 Gallaher Road, Kingston, Tennessee 37763.

14. A. Radioactive material authorized by this license shall be used by, or under the supervision of, individuals who have been designated to meet the requirements and approvals established by the licensee in statements, representations and procedures contained in this license. An Authorized User must be physically present on site whenever radioactive material is being used which is defined as any handling or processing operation involving radioactive materials.

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B. The Radiation Safety Officer for this license is James H. Dailey.

15. Pursuant to 0400-20-05-.121 and 0400-20-05-.123 of "State Regulations for Protection Against Radiation," the licensee may dispose of radioactive material by incineration in accordance with statements, representations, and procedures contained in application dated July 11, 2014, with attachments, and other material referenced in conditions of this license.

16. The licensee shall maintain complete and accurate records of the receipt and disposal of radioactive material. The licensee shall, for radioactive material no longer useful for any purpose and for any equipment or supplies contaminated with such material for which further use and decontamination is not planned, define those materials as radioactive waste and treat them as such in accordance with the following provisions:

    A. Radioactive waste material shall not be stored with non-radioactive waste.

    B. A written record of all radioactive waste material shall be maintained until it has been determined by a suitable survey or radioassay that it has decayed to background levels or until it has been shipped to an authorized recipient in accordance with all applicable regulations. Accountability of radioactive waste material prepared for shipment but not yet shipped from the licensee's premises shall be maintained by the licensee by an internal record system such that the licensee is constantly aware of the material's location and the proposed time of shipment. Individuals who are involved in the shipping of such material and/or the storage of such material prior to shipment, shall be trained in the precautions necessary for such handling and storage.

    C. For material which has decayed to background levels as determined by radioassay or external level as measured with appropriately calibrated instruments, records shall indicate that the material was determined to be no longer radioactive and will indicate the methods and results of the survey or analysis.

    D. Shipment records of radioactive waste material shall be maintained and the licensee shall require written confirmation from the authorized recipient of such material that this material has been received.

    E. All records and written confirmations required by this condition shall be maintained for inspection by the Department.

    The requirements for this condition are in addition to any other requirements for the handling and/or disposal of radioactive material contained in this license and "State Regulations for Protection Against Radiation."

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17. A. Sealed sources authorized by this license in Items K. and L. shall be tested for leakage and/or contamination at intervals not to exceed three (3) years, or as specified in the NRC Sealed Source and Device Registry. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to transfer, the sealed source shall not be put into use until tested.

B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surface of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak tests shall be kept in units of microcuries and maintained for inspection by the Department.

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within five (5) days of the test with the Division of Radiological Health, Tennessee Department of Environment and Conservation, William R. Snodgrass Tennessee Tower, 15th Floor, 312 Rosa L. Parks Avenue, Nashville, Tennessee, 37243, describing the equipment involved, the test results, and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed in accordance with statements, representations, and procedures contained in application dated July 11, 2014, with attachments, or by persons specifically licensed by this Department, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform such services.

18. Notwithstanding the periodic leak test required by Condition 17, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

19. The licensee shall not open sealed sources containing radioactive material.

20. Detector cells containing Nickel 63 authorized by this license shall only be used in conjunction with a properly operating temperature control mechanism which prevents the temperature of the foil from exceeding the specifications authorized in the NRC Sealed Source and Device Registry.

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21. Maintenance and repair of detector cells containing radioactive material shall be performed only by the manufacturer, or by other persons specifically authorized by this Department, the U.S. Nuclear Regulatory Commission, or another Agreement State to perform such services.

22. Detector cells containing licensed material shall not be opened or the foil sources removed from the detector cell by the licensee.

23. When not installed in a gas chromatograph, detector cells containing licensed material shall be stored in a properly labeled container under lock and key to prevent access by unauthorized individuals.

24. In lieu of using the conventional radiation caution colors (magenta or purple or black on yellow background) as provided in 0400-20-05-.110(1) of "State Regulations for Protection Against Radiation," the licensee is hereby authorized to label detector cells and cell baths, containing byproduct material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.

25. No provision of this license relieves the licensee from compliance with other Federal, State and local laws, ordinances, and regulations applicable to the licensee's activities.

26. The licensee is authorized to perform leak testing of sealed sources in accordance with statements, representations, and procedures contained in correspondence referenced in Condition 39 of this license.

    The tests shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample, or in the case of radium, the escape of radon at the rate of 0.001 microcurie per 24 hours. The customer shall be furnished a report of the results in units of microcuries.

    If the test reveals the presence of 0.005 microcurie or more of removable contamination, or in the case of radium, the escape of radon at the rate of 0.001 microcurie or more per 24 hours, the customer of the licensee shall be informed of the Department's requirements as follows: "The licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations."

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A report shall be filed within five (5) days of the test with the Division of Radiological Health, Tennessee Department of Environment and Conservation, William R. Snodgrass Tennessee Tower, 15th Floor, 312 Rosa L. Parks Avenue, Nashville, Tennessee 37243, describing the equipment involved, the test results, and the corrective action taken.

27. The licensee is authorized to receive, possess, and use any radioactive material distributed under a general license, issued by the U.S. Nuclear Regulatory Commission, another Agreement State, or a Licensing State without being specifically referenced in Items 6, 8, 9,and 10 of this license. Notwithstanding any other conditions of this license, the general licensee may possess and use radioactive material received under the provisions of "State Regulations for Protection Against Radiation", 0400-20-10 in accordance with the requirements provided at the time of transfer of the radioactive material under the terms of the general license.

28. No radioactive material (excluding calibration and standardization sources or useable equipment) or radioactive waste may be possessed under this license, from its time of receipt or generation until its disposal or transfer from the facility, for a period of time greater than three hundred and sixty-five (365) days, except that radioactive material (not excluded above) which does not have a location for disposal that is approved by all regulatory agencies that have jurisdiction over the material and its disposal may be stored for greater than three hundred and sixty-five (365) days. The quantity of radioactive material that may be stored for this extended period of time shall not exceed twenty (20) percent of the possession limit authorized by Item 9 of this license.

29. The licensee shall not accept either radioactive waste and/or items contaminated or potentially contaminated with licensable quantities of radioactive material or radioactive materials or items from licensable activities for repackaging, processing, refurbishing, storage pending disposal or disposal unless the shipper of such waste possesses a valid License for Delivery issued pursuant to 0400-20-10-.32 of "State Regulations for Protection Against Radiation."

30. Written assurances must be furnished by the facility shipping the radioactive material indicating that the facility may accept return of the material processed or unprocessed. In addition, for states outside the Southeast Compact the state or appropriate Compact must be a signatory to the Interregional Access Agreement for Waste Management or assurances shall be obtained from the appropriate state governor's office, the state radiation control program, and the appropriate Compact official, if any.

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31. The licensee shall establish in every contractual obligation relating to radioactive materials the ability to return radioactive materials, processed or unprocessed, to the prior licensed or exempt possessor.

32. A. The licensee shall develop and maintain written radiological protection procedures that ensure implementation of the radiation safety program in accordance with "State Regulations for Protection Against Radiation" (SRPAR), ALARA, and the documents referenced in conditions of this license.

    B. In addition, the licensee shall develop and implement written standard operating procedures to ensure all activities involving the handling and/or use of radioactive materials authorized by this license are carried out in a manner consistent with SRPAR, ALARA, and the documents referenced in Condition 49 of this license. Activities for which written procedures must be developed include the operation and maintenance of processing equipment, waste treatment systems, and all ancillary systems in, or on, which radioactive materials may be present.

    C. The written procedures required by this license by this condition shall be available for inspection by the Department. These written procedures may be modified without prior approval of the Department when deemed appropriate and documented by the Radiation Safety Officer. However, adherence to the current procedures as written shall be considered a condition of the license.

33. The licensee shall, prior to exceeding eighty (80) percent of the regulatory limit (public dose), either by calculation or physical measurement, notify both the Division's Environmental Field Office Manager in Knoxville and the Division's Manager of Licensing and Registration in Nashville.

34. The licensee shall, within thirty (30) days after the end of each calendar quarter, submit a report to the Division's Manager of Licensing and Registration in Nashville. The report shall include the number of burns in the quarter, the total activity burned by isotope, the monitored fenceline dose (OSLD) results, and the public TEDE indicated in section 5.1.1 of the "Environmental Radiation Dose Control Procedure," document number RP-017.

35. The licensee is authorized to store containers which previously contained radioactive material (empty containers) outside of the DSSI building in accordance with statements, representations, and procedures contained in application dated July 11, 2014, with attachments. Each empty container in outside storage shall:

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1. Be emptied of contents as far as practical;

2. Contain no hazardous material or standing liquid;

3. Be in unimpaired condition and securely closed so that there will be no leakage under conditions normally incident to transportation or storage;

4. Have no radiation levels on the external surface of the package exceeding 0.5 mR/hr average and 2.0 mR/hr hotspot;

5. Have no non-fixed contamination on the external surface of the package exceeding the NRC Reg. Guide 1.86 free release limits;

6. Have no internal non-fixed contamination exceeding:

Beta and gamma emitters and low toxicity alpha emitters*;	2200 dpm/cm^2
All other alpha emitters	220 dpm/cm^2

(*As defined by USDOT 49CFR 173.403)

7. Have any labels previously applied removed, obliterated, or covered and an "Empty" label affixed;

8. Be stored on a paved (asphalt or concrete) surface; and

9. Be arranged such that the containers can be visually inspected on all sides.

36. The following evaluations shall be performed for all process ventilation systems:

A. Air balance within the RCA at least semi-annually, and following any ventilation system or process changes which could potentially alter the effectiveness of the system.

B. Particulate removal efficiency of the main filtration system HEPA filters by DOP or comparable testing in accordance with pertinent ANSI standards immediately following installation of new HEPA filters or at least semi-annually. This condition authorizes the use of the procedure for HEPA testing described in application dated July 11, 2014, with attachments.

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37. An exemption is granted to the requirements of 0400-20-05-.113(1) of "State Regulations for Protection Against Radiation" to not require the posting of containers of radioactive material with the wording "CAUTION, RADIOACTIVE MATERIAL." Containers of radioactive waste may be marked as containing radioactive material, and be marked with a unique identification number as stated in 4.2.2 of the DSSI License Operational Criteria.

    This exemption may be withdrawn or modified by the Department at any time it is determined necessary to protect the public health and safety or if it is found that the conditions on which this exemption is based have been violated.

38. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 8, and 9 of this license in accordance with statements, representations, and procedures contained in the following:
    - Application dated July 11, 2014, with attachments
    - Letters dated July 3, 2014, March 5, 2015, with attachments, July 25, 2016, with attachments, and September 1, 2016, with attachments, January 18, 2017, March 24, 2017, with attachments, October 12, 2017, with attachments, November 7, 2017, with attachments, November 27, 2017, with attachments, **May 16, 2018, with attachments, and June 4, 2018, with attachments**
    - Email dated August 5, 2014, with attachment