



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243**

RADIOACTIVE MATERIAL LICENSE

Amendment 231

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.

<p style="text-align: center;">LICENSEE</p> <p>1. Name Toxco, Inc. d/b/a Toxco Materials Management Center</p>	<p>3. License Number R-01037-J26</p>
<p>2. Address 109 Flint Road Oak Ridge, Tennessee 37830</p>	<p>4. Expiration Date October 31, 2026</p>
	<p>5. File No. R-01037</p>

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

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: April 16, 2024

By:
Division of Radiological Health
Ronald J. Parsons, Radioactive Material Licensing Manager



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Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

6. Radioactive Material (Element and <u>Mass Number</u>)	8. Chemical and/or <u>Physical Form</u>	9. Maximum Radioactivity and/or Quantity of Material Which Licensee May <u>Possess at Any One Time</u>
A. Mixed activation and fission products with atomic numbers 3-83 inclusive(excluding C-14, Fe-55, and Ni-63)	A. Any form as suitable for transport under U.S. DOT Regulations	A. 200 Curies
B. Source material (natural or depleted uranium, thorium)	B. Same as 8.A.	B. 19 Curies
C. Uranium 233	C. Same as 8.A.	C. 200 grams *
D. Uranium 235	D. Same as 8.A.	D. 350 grams *
E. Plutonium	E. Same as 8.A.	E. 200 grams * <u>and 2 Curies</u>

* 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).

F. Radioactive materials with atomic numbers 93 and 95-100 inclusive	F. Same as 8.A.	F. 100 Curies
G. Radioactive materials with atomic numbers 84-91 inclusive (excluding source material)	G. Same as 8.A.	G. 10 Curies
H. Hydrogen 3	H. Same as 8.A.	H. 1500 Curies
I. C-14	I. Same as 8.A.	I. 50 Curies
J. Fe-55	J. Same as 8.A.	J. 100 Curies



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Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

K. Ni-63	K. Same as 8.A.	K. 100 Curies
L. Any radioactive material	L. Sealed source	L. No single source to exceed 1 millicurie. Total not to exceed 5 millicuries.
M. Cs-137, Co-60	M. Sealed source (Model numbers as designated in U.S. NRC Registry of Radioactive Sealed Sources and Devices CA-0215-D-110-S)	M. No single source to exceed 2.3 curies of Cs-137 and 1.25 curies of Co-60. Total not to exceed 11.5 curies of Cs-137 and 12.5 curies of Co-60.
N. Radium 226/Cesium 137/Americium 241	N. Sealed sources	N. As necessary for the uses authorized in Item 10N.
O. Radium 226	O. Sealed sources	O. 2.0 Curies
P. Nickel 63 Americium 241 Hydrogen 3 Promethium 147	P. Any	P. Total not to exceed 4 curies of Nickel 63, 420 millicuries of Americium 241, 200 curies of Hydrogen 3, and 8 curies of Promethium 147

10. Authorized Use

A.through K. Receipt, possession, storage, unpackaging, processing, decontamination, survey for unrestricted release, repackaging, loading for transport, transfer, and disposal in accordance with statements, representations, and procedures contained in the references in conditions of this license.

L. Calibration and/or standardization sources (Manufactured and distributed in accordance with a license issued by the Department, the U.S. Nuclear Regulatory Commission, an Agreement State or Licensing State, as appropriate)

M. Receipt, possession, storage, and transfer of SAIC Model Mobile VACIS RD portable gauges as specified in letter dated March 9, 2018, with attachments.



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Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243

RADIOACTIVE MATERIAL LICENSE

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

- N. Storage of sealed sources or devices referenced and in accordance with statements, representations, and procedures referenced in letter dated September 13, 2019, with attachment. The date of this amendment is considered the material's time of receipt and is subject to the transfer or disposal requirements referenced in Condition 14.
- O. Storage of sealed sources referenced and in accordance with statements, representations, and procedures referenced in letters dated December 30, 2019, August 10, 2020, and subject to the transfer or disposal requirements referenced in Condition 14.
- P. Fabrication of encapsulated sources in the form of batteries powered and/or enhanced by radioactive materials in accordance with letters dated November 29, 2022, with attachments, and May 1, 2023.

Conditions (continued)

- 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. A. Radioactive material authorized by this license except Item P shall be used by, or under the supervision of Rick L. Low, Alan Duff, Joe Turpin, Jonathan Roberts, Randy Williams, Jon R. Merkel, Greg Kirk, or Kevin Duff.
- B. Radioactive material authorized by this license in Item P shall be used by, or under the supervision Brenda Smith, Ph.D.
- C. The licensee is authorized to exempt certain activities conducted at this facility that do not directly involve the use of radioactive material from licensed user coverage required above. The Radiation Safety Officer shall be responsible for ascertaining the extent to which radioactive material contamination is present, and the precautions necessary to minimize exposure, and the extent to which these activities may be performed without licensed user coverage. The health and safety work permit issued pursuant to this authorization shall define the activity, and the amount of health physics support needed in the absence of an authorized user. These records shall be made available for inspection by the Department.
- D. The Radiation Safety Officer for this license is Alan Duff.
- 14. No radioactive material (excluding calibration and standardization sources, VACIS sources in Item M, and material in Condition 31) or radioactive waste may be possessed under this license, from its time of receipt until its transfer from the facility, for a period of time greater than three hundred sixty-five (365) days.



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243
RADIOACTIVE MATERIAL LICENSE**

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

15. No radioactive material or radioactive waste may be stored so as to exceed the following stacking limits:

<u>Container Type</u>	<u>Stacking Limit</u>
Drums	3 high
B-25 Boxes	3 high
B-12 Boxes	5 high
Sea-Land Cont.	1 high
Any other strong tight container.	10 feet nominal unless the natural height of the container exceeds 10 feet

This condition also includes “waste radioactive material” generated under the authority of this license.

16. The combined authorization for processing and storage granted by this license shall not exceed a total of 66,976 square feet. The licensee is required to provide \$2,812,992.00 (U.S. Dollars) in financial assurance monies in accordance with “State Regulations for Protection Against Radiation.”
17. The licensee is authorized to store containers which previously contained radioactive material (empty containers) in areas not covered by financial assurance including outside of the process and storage buildings. Each empty container in outside storage shall:
- A. Contain no hazardous material;
 - B. Be emptied of contents as far as practical (49 CFR 173.428);
 - C. Contain no standing liquid;
 - D. Be in unimpaired condition and securely closed so that there will be no leakage under conditions normally incident to transportation or storage [49 CFR 173.428(b)];
 - E. Have no radiation levels on the external surface of the package exceeding 0.5 mR/hr average and 2.0 mR/hr hotspot;
 - F. Have no removable surface contamination on the external surface of the package exceeding 10% of Regulatory Guide 1.86 free-release limits;
 - G. Have no internal contamination exceeding:
 - 1) Beta and gamma emitters and low toxicity alpha emitters* 2400 dpm/cm²
 - 2) All other alpha emitters 240 dpm/cm²
 - H. Have any labels previously applied removed, obliterated, or covered, and an “Empty label affixed [49 CFR 173.428(e)]
 - I. Be stored on a paved (asphalt or concrete) surface, or other surface in which water runoff from that surface is appropriately monitored for radioactivity, and
 - J. Be arranged such that the containers can be visually inspected on all sides.

*As defined by U.S. DOT 49 CFR 173.403



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH**
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243

RADIOACTIVE MATERIAL LICENSE

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

18. 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, storage pending transfer/disposal or transfer/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."
19. 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.
20. 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.
21. 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 are 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 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.



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243
RADIOACTIVE MATERIAL LICENSE**

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

- 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. Transfer of radioactive waste to a land disposal facility or a licensed waste handler shall be done in accordance with 0400-2-5-.125 of "State Regulations for Protection Against Radiation."
- F. All records and written confirmations required by this condition shall be maintained for inspection by the Department.

The requirements of 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."

- 22. A. Sealed sources authorized by this license except for VACIS sources in Item M shall be tested for leakage and/or contamination at intervals not to exceed six (6) months. Sources 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. Before taking possession of each VACIS system source, the licensee shall have a certificate from a transferor that a leak test has been made within six months prior to transfer.
- B. 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 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, or in the case of radium, the escape of radon at the rate of 0.001 microcurie or more per 24 hours, 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, Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, 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 by the licensee, or by other persons authorized by this Department, the U.S. Nuclear Regulatory Commission, or another Agreement State to perform such services.



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH**
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243

RADIOACTIVE MATERIAL LICENSE

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

23. Notwithstanding the periodic leak test required by Condition 22, 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.
24. 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, or another Agreement 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 0400-20-10 of "State Regulations for Protection Against Radiation" in accordance with the requirements provided at the time of the transfer of the radioactive material under the terms of the general license.
25. 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.
26. In addition to other requirements of this license or of Chapter 0400-20-05-.60 of "State Regulations for Protection Against Radiation," the licensee shall conduct operations so that radiation levels in unrestricted areas would not cause an individual, assuming an occupancy of one (1), to receive a total effective dose equivalent in excess of 500 millirems in one calendar year. These radiation levels shall be appropriately monitored by the licensee, and records of such monitoring shall be maintained for inspection by the Department. For calculational purposes of this condition, the licensee shall base its anticipated exposure to a member of the public upon the sum of the maximally exposed dosimeter and the highest air concentration derived using the latest available pertinent data.
27. 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 conditions 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.



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DIVISION OF RADIOLOGICAL HEALTH
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243
RADIOACTIVE MATERIAL LICENSE**

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

- C. The written procedures required 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.
28. A. The licensee is authorized to characterize and release bulk material for disposal to the Chestnut Ridge Landfill in Heiskell, TN in accordance with statements, representations, and procedures contained in application dated July 28, 2016, with attachments, and the most current BSFR concentration limits established by the Division of Radiological Health for Chestnut Ridge Landfill. The Radium 226 disposal limit for Chestnut Ridge will be 5 pCi per gram.
- B. Records of all disposals made under this condition shall be submitted quarterly to the Division of Radiological Health, **Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243**. Monitoring of materials for contamination for release as authorized by this condition is only to be conducted at the licensee's facilities in Item 2 of the license, and not at customer or other job sites.
- C. The licensee shall meet the requirements of the March 2020 DRH-RAM-G-410-004-03192020 Licensing Requirements for Evaluation and Acceptance of Licensee Requests for the Disposal of Materials with Extremely Low Levels of Contamination in Class 1 (Subtitle D) Landfills (Bulk Survey for Release (BSFR))
- D. For calendar year 2024 the licensee is approved to dispose of 7837 tons of material in Chestnut Ridge landfill.
29. The licensee in making disposal of radioactive wastes to the sanitary sewerage system shall do so in conformity with 0400-20-05-.122 of "State Regulations for Protection Against Radiation."
30. In addition to the possession limits in Item 9, the licensee shall further restrict the possession of licensed material to quantities below the limits specified in "State Regulations for Protection Against Radiation" 0400-20-10-.13(20) which require consideration of the need for an emergency plan for responding to a release of licensed material.
31. The licensee is authorized to store indefinitely radioactively contaminated or activated items (this does not include storage of sealed sources or devices. Examples of these items are contained as an attachment letter dated February 5, 2019) that have present and/or future value for use at Toxco Materials Management Center (TMMC) or in the nuclear industry as determined by TMMC management in accordance with statements, representations, and procedures contained in letters dated February 5, 2012 with attachments, and September 13, 2019, with attachment.



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF RADIOLOGICAL HEALTH**
Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243

RADIOACTIVE MATERIAL LICENSE

Amendment 231

License No. R-01037-J26

S U P P L E M E N T A R Y S H E E T

32. The licensee is authorized to conduct environmental surveys and sampling within its restricted area and potentially affected off-site areas adjacent to its licensed facility as needed to locate the source of any soil, sediment, or water contaminated with licensed radioactive materials. The licensee is also authorized to remediate any areas contaminated with licensed radioactive materials, including removal, containerization, and relocation of resultant containers to authorized on-site waste storage areas. Any off-site activities described above including surveys, sampling, remediation, and post-remediation and final radiological status surveys shall be conducted in accordance with a plan submitted to and accepted by the Division of Radiological Health.
33. Notwithstanding the requirements of Condition 14 of this license, the licensee is authorized to store radioactive material referenced in letters dated October 31, 2022 until April 1, 2023.
34. Notwithstanding the requirements of Condition 14 of this license, the licensee is authorized to store radioactive material referenced in letter dated March 21, 2023, until July 14, 2023. A record of this disposal shall be maintained and a copy submitted to the Department when completed.
35. **Notwithstanding the requirements of Condition 14 of this license, the licensee is authorized to store radioactive material referenced in email dated December 20, 2023, and letter dated March 28, 2024, with attachments, until May 31, 2024. A record of this disposal shall be maintained and a copy submitted to the Department when completed.**
36. 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.
37. 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 28, 2016, with attachments
 - Email dated May 1, 2018, with attachments, December 20, 2023
 - **Letter received March 28, 2024, with attachments**
 - Letters dated February 5, 2012, with attachments, May 18, 2016, August 23, 2016, with attachments, November 5, 2016, with attachments, January 10, 2017, April 22, 2017, with attachments, May 24, 2017, July 19, 2017, February 5, 2018, March 9, 2018, with attachments, April 26, 2018, May 17, 2018, September 13, 2019, with attachment, December 30, 2019, July 21, 2020, August 10, 2020, April 5, 2022, October 31, 2022, November 29, 2022, with attachments, March 8, 2023, March 21, 2023, and May 1, 2023.