

## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Health

DIVISION:

SUBJECT: Pain Management Clinics; Minimum Qualifications for Initial Licensure, including Fees for Licensure and Renewal

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 63-1-303

EFFECTIVE DATES: September 30, 2011 through March 28, 2012

FISCAL IMPACT: The agency does not anticipate that the promulgation of these rules will result in a positive or negative fiscal impact. The fees contained in the rules anticipate making the program self-sufficient.

### STAFF RULE ABSTRACT:

Public Chapter 340 of 2011 created a registration program for the regulation of pain management clinics, and although the law does not become effective until January 1, 2012, rules for the implementation of this program must be promulgated by October 1, 2011.

These rules implement the law relative to the regulation of pain management clinics.

Through the rulemaking authority established in Tennessee Code Annotated, § 63-1-303, the Commissioner of Health, in consultation with the Board of Medical Examiners, Board of Osteopathic Examination, Board of Nursing, and Committee on Physician Assistants, has the authority to promulgate rules to establish the following, including, but not limited to: the operation of the clinic; personnel requirements at the clinic; and training requirements.

Through these rules, the Commissioner has established the minimum qualifications for initial licensure; qualifications for renewal; fees for initial licensure and renewal; the responsibilities of the medical director and clinic owner(s) to ensure quality care, as well as the training requirements for the medical director of the clinic and for the health care practitioners who will be providing pain management services at the clinic.

## Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

It is not anticipated these rules will have an impact on local governments.

**Department of State  
Division of Publications**

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**For Department of State Use Only**

Sequence Number: 09-25-11  
Rule ID(s): 5028  
File Date (effective date): 09/30/2011  
End Effective Date: 03/28/2012

# Emergency Rule Filing Form

*Emergency rules are effective from date of filing for a period of up to 180 days.*

<b>Agency/Board/Commission:</b>	Department of Health
<b>Division:</b>	Pain Management Clinics
<b>Contact Person:</b>	Andrea Huddleston, Deputy General Counsel
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<b>Phone:</b>	(615) 741-1611
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**Rule Type:**

Emergency Rule

**Revision Type (check all that apply):**

Amendment

New

Repeal

**Statement of Necessity:**

Public Chapter Number 340 of the Public Acts of 2011 created a registration program for the regulation of pain management clinics and although the law does not become effective until January 1, 2012, rules for the implementation of this program must be promulgated by October 1, 2011.

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1200-34-01	Pain Management Clinics
Rule Number	Rule Title
1200-34-01-.01	Purpose
1200-34-01-.02	Definitions
1200-34-01-.03	Certification, Renewal, and Reapplication
1200-34-01-.04	Fees
1200-34-01-.05	Inspections and Investigations
1200-34-01-.06	Notifications
1200-34-01-.07	Medical Director Responsibilities
1200-34-01-.08	Certificate Holder Responsibilities
1200-34-01-.09	Training Requirements
1200-34-01-.10	Civil Penalties

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

1200-34-01	Pain Management Clinics.
1200-34-01-.01	Purpose.
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1200-34-01-.04	Fees.
1200-34-01-.05	Inspections and Investigations.
1200-34-01-.06	Notifications.
1200-34-01-.07	Medical Director Responsibilities.
1200-34-01-.08	Certificate Holder Responsibilities.
1200-34-01-.09	Training Requirements.
1200-34-01-.10	Civil Penalties.

#### 1200-34-01-.01 Purpose.

The rules in this chapter implement the law relative to the certification and regulation of pain management clinics pursuant to T.C.A. § 63-1-301, et seq.

Authority: T.C.A. §§ 63-1-301 through 63-1-311.

#### 1200-34-01-.02 Definitions.

In addition to the definitions contained in T.C.A. § 63-1-301, the following definitions are applicable to this chapter:

- (1) "Applicant" means a person who has submitted or is in the process of submitting an application to operate a pain management clinic;
- (2) "Department" means Department of Health;
- (3) "Commissioner" means Commissioner of Health;
- (4) "Certificate Holder" means the person who holds a certificate as a pain management clinic and is the owner or one of the owners of the clinic;
- (5) "Controlled Substance" means a drug, substance, or immediate precursor identified, defined or listed in title 39, chapter 17, part 4 and title 53, chapter 11;
- (6) "Health Care Provider" means a medical doctor licensed under Title 63, Chapter 6; osteopathic physician licensed under Title 63, Chapter 9; advanced practice nurse licensed under Title 63, Chapter 7, who meets the requirements contained in T.C.A. §63-7-126; or a physician assistant licensed under Title 63, Chapter 19;
- (7) "Medical Director" means an individual licensed as a physician under Title 63, Chapter 6 or Chapter 9 who practices in this State with an unrestricted, unencumbered license and who provides oversight relative to the operations of the pain management clinic;
- (8) "Medical Record" shall have the same meaning as set forth in T.C.A. §63-1-117;
- (9) "Pain Management Clinic" or "Clinic" shall have the same meaning as set forth in T.C.A. §63-1-301(5);

- (10) "Pain Management Services" means evaluation, diagnosis, or treatment for the prevention, reduction, or cessation of the symptom of pain through pharmacological, non pharmacological and other approaches;
- (11) "Patient Agreement" means a written document signed by the patient which, at a minimum, addresses patient responsibility for proper use and safeguarding of medications, describes the clinic's drug screening policy, provides for prescriptions to be filled at only one pharmacy to be identified by the patient and addresses the use of controlled substances prescribed by other providers;
- (12) "Person" means any individual licensed under Title 63 who may own or form an entity providing pain management services, including but not limited to a professional corporation or professional limited liability company pursuant to applicable Tennessee laws and rules;
- (13) "Unencumbered" means an active license that is not suspended or on probation at the time the clinic owner(s) submit a pain management clinic application and that does not have any conditions, restrictions, or limitations.
- (14) "Urine Drug Screen" means urinalysis performed using a commercial test kit in a pain management or other clinic or at a reference laboratory that tests for the presence of at least the controlled substance(s) being prescribed as well as marijuana, naturally occurring opiates, benzodiazepines, cocaine and methamphetamines and may include any additional controlled substances at the discretion of the clinic.

Authority: T.C.A. §§ 63-1-301, 63-1-303, and 63-1-306.

1200-34-01-.03 Certification, Renewal, and Reapplication.

(1) Certification.

- (a) Beginning January 1, 2012, in order to obtain a certificate as a pain management clinic, an applicant shall submit the following to the Department:
  - 1. a completed application on a form prescribed by the Department;
  - 2. a completed form prescribed by the Department showing proof of having a medical director who is a physician who practices in Tennessee under an unrestricted and unencumbered license issued pursuant to T.C.A. § 63-6-201 or 63-9-104;
  - 3. proof of having obtained a Drug Enforcement Administration registration for the clinic, if required pursuant to federal laws and rules;
  - 4. proof of Drug Enforcement Administration registrations for the individual health care providers who provide pain management services at the clinic, if required pursuant to federal laws and rules;
  - 5. the results of a criminal background check or criminal background checks for all of the pain management clinic owners (whole or partial owners) to be sent directly from the vendor to the Department;
  - 6. a list of individuals who own, co-own, operate or otherwise provide pain management services in the clinic as an employee or a person with whom the clinic contracts for services;
  - 7. a disclosure of any license denial, restriction, or discipline imposed on an owner, co-owner, operator, individual who provides services at the clinic, employee of the clinic, or person with whom the clinic contracts for services pursuant to T.C.A. §63-1-309;

- 8. payment of the application fee and initial certification fee; and
  - 9. any other information requested by the Department.
- (b) An applicant shall submit a separate application for certification for each clinic location regardless of whether the clinic is operated under the same business name, ownership, or management as another clinic.
  - (c) If an applicant does not complete the application process within sixty (60) days after the Department receives the application because the application lacks the required information or fails to meet the prerequisites for certification, then the application will be closed, the application fee will not be refunded, and the applicant shall reapply for certification.
  - (d) Any application that is submitted to the Department may be withdrawn at any time prior to the grant or denial of certification; provided, however, that the application fee will not be refunded.
- (2) Renewal.
- (a) A pain management clinic certificate shall expire two (2) years from the date of issuance. All certificates shall be renewed on or before the last day of the two (2)- year certificate cycle.
  - (b) A certificate holder may renew a current, valid certificate prior to its expiration date by submitting the following to the Department:
    - 1. a renewal application form prescribed by the Department;
    - 2. the required renewal fee;
    - 3. proof of having a medical director who meets the requirements contained in these rules;
    - 4. an attestation that the clinic is not owned wholly or partly by a person who has been convicted of, pleaded nolo contendere to, or received deferred adjudication for:
      - (i) an offense that constitutes a felony; or
      - (ii) an offense that constitutes a misdemeanor, the facts of which relate to the distribution of illegal prescription drugs or a controlled substance as defined in §39-17-402; and
    - 5. any other information requested by the Department.
- (3) Late Renewal and Reapplication.
- (a) The pain management clinic may renew its certificate within ninety (90) days after the certificate expiration date with payment of the renewal fee and late renewal penalty fee, and after having completed all of the other requirements for renewal. After the ninety (90)- day grace period, the certificate holder may reapply for a new certificate.

Authority: T.C.A. §§ 63-1-303, 63-1-306, 63-1-307, and 63-1-308.

1200-34-01-.04 Fees.

- (1) Initial certificate fee..... \$405.00

- (2) Renewal fee..... \$405.00
- (3) Regulatory fee..... \$10.00
- “ (4) The late renewal penalty fee is one hundred dollars (\$100.00) per month for each month or fraction of a month that renewal is late.

Authority: T.C.A. §§63-1-303, 63-1-306, and 63-1-308.

1200-34-01-.05 Inspections and Investigations.

- (1) Upon the inspection of a pain management clinic by the boards regulating the health care providers working for or at the clinic, the owners, officers, employees, or authorized representatives of the pain management clinic shall allow board representatives access to the pain management clinic and the records contained therein, including, but not limited to medical records.
- (2) The owners, officers, employees or authorized representatives of the pain management clinic or independent contractors working at the pain management clinic shall provide copies of all documentation, including but not limited to medical records, requested by the board regulating the health care providers working for or at the clinic, in connection with an inspection or investigation of the pain management clinic in accordance with T.C.A. § 63-1-117.

Authority: T.C.A. §§ 63-1-303, 63-1-304, 63-1-305, and 63-1-306.

1200-34-01-.06 Notifications.

- (1) In the event that there is a change in the majority ownership of the clinic, the certificate holder shall notify the Department within ten (10) business days after the change in majority ownership.
- (2) Within ten (10) business days after notification of the change in majority ownership, the certificate holder shall submit a new application for a certificate to the Department.
- (3) In the event that the clinic no longer has a medical director or the medical director no longer meets the requirements contained in the T.C.A. §§63-1-301 et seq. and these rules, the certificate holder shall notify the Department within ten (10) business days of the identity of another physician who will serve as the medical director for the clinic on a form prescribed by the Department. Failure to obtain a new medical director within ten (10) days may result in disciplinary action, including revocation of certificate.
- (4) A certificate holder shall notify the Department within ten (10) business days of the occurrence if any person who owns, co-owns, operates, provides pain management services in the clinic, is an employee of the clinic, or contracts with the clinic to provide services has been denied, held a restricted certificate, or been subject to disciplinary action relative to prescribing, dispensing, administering, supplying or selling a controlled substance.
- (5) In the event that the name of the clinic changes, the certificate holder shall notify the Department of the name change within ten (10) business days after the name change occurs.

Authority: T.C.A. §§ 63-1-303, 63-1-306, and 63-1-309.

1200-34-01-.07 Medical Director Responsibilities.

- (1) Clinic Operation and Personnel.
  - (a) The medical director of a pain management clinic shall:

1. oversee all of the pain management services provided at the clinic;
2. be on-site at the clinic at least twenty percent (20%) of the clinic's weekly total number of operating hours;
3. ensure that each supervising physician for each of the health care providers working at the clinic complies with the supervision requirements contained in Tenn. Comp. Rules and Regulations Chapter 0880-03 and Chapter 0880-06, or Rule 1050-02-.15, as applicable. Should the medical director of the clinic serve as a health care provider's supervising physician, the medical director must ensure that he or she complies with Chapter 0880-03 and Chapter 0880-06. or Rule 1050-02-.15, as applicable;
4. ensure that all health care providers employed by or working at the pain management clinic comply with applicable state and federal laws and rules relative to the prescribing of controlled substances in the pain management clinic;
5. ensure the establishment of protocols for the health care providers employed by or working at the pain management clinic as provided in Tenn. Comp. Rules and Regulations Chapter 0880-03 and Chapter 0880-06 and ensure that providers comply with such protocols, as well as any other established policies and procedures;
6. ensure that there is an alternate or substitute medical director in the event that the medical director for the clinic is unable to fulfill his or her duties on a temporary basis because of illness, vacation, or unavailability;
7. establish quality assurance policies and procedures, which, at a minimum, include, but are not limited to:
  - (i) documentation of the background, training, licensure, and certifications for all pain management clinic staff providing patient care;
  - (ii) a written drug screening policy and compliance plan for patients to include random urine drug screening as clinically indicated, but at a minimum, upon each new admission and once every six (6) months thereafter;
  - (iii) evaluating and monitoring the quality and appropriateness of patient care, the methods of improving patient care as well as identifying and correcting deficiencies, and the opportunities to improve the clinic's performance and quality of care;
  - (iv) medication counts for all controlled substances prescribed to each patient, even those controlled substances prescribed by a health care provider other than the providers at the clinic;
  - (v) use of patient agreements and periodic review of such agreements;
  - (vi) health care provider access to and review of patient information contained in the controlled substance monitoring database in accordance with T.C.A. §§53-10-301 - 53-10-309, as clinically indicated, but at a minimum upon each new admission and once every six (6) months thereafter;
  - (vii) documentation of requests for records from other health care providers;

8. establish an infection control program to provide a sanitary environment for the prevention, control, and investigation of infections and communicable diseases, including, but not limited to:
  - (i) written infection control policies and procedures;
  - (ii) techniques and systems for identifying, reporting, investigating and controlling infections at the clinic;
  - (iii) written policies and procedures relative to the use of aseptic techniques;
  - (iv) training for clinic staff providing direct patient care relative to infection control and aseptic techniques; and
  - (v) a log of incidents related to infectious and communicable diseases and the corrective action taken;
9. establish written policies and procedures for health and safety requirements at the clinic;
10. ensure compliance with the patient safety standards established by the licensing boards for each health care provider;
11. establish written policies and procedures to assure patient access to their medical records and continuity of care should the pain management clinic close.

(2) Records, Reporting Requirements, and Patient Billing Procedures.

- (a) The medical director shall ensure that each health care provider employed by or working at a certified pain management clinic shall maintain complete and accurate medical records of patient consultation, examination, diagnosis, and treatment, which shall include, but not be limited to the following:
  1. patient medical history;
  2. physical examination;
  3. diagnostic, therapeutic, and laboratory results;
  4. evaluations and consultations;
  5. treatment objectives;
  6. documentation of informed consent and discussion of risks and benefits of treatment provided;
  7. treatments and treatment options;
  8. medications prescribed (including date, type, dosage and quantity prescribed);
  9. instructions and agreements;
  10. periodic reviews;
  11. reason for prescribing or dispensing more than a seventy-two (72) hour dose of controlled substances for the treatment of chronic nonmalignant pain;
  12. a notation indicating whether the controlled substance monitoring database had been accessed for a particular patient;

13. copies of records, reports, or other documentation obtained from other health care providers;
14. results of urine drug screens to be performed as clinically indicated, but at a minimum upon each new admission and once every six (6) months thereafter.

Authority: T.C.A. §§ 63-1-303, 63-1-306, and 63-1-309.

1200-34-01-.08 Certificate Holder Responsibilities.

- (1) The certificate holder shall ensure that adequate billing records are maintained onsite at the pain management clinic and shall ensure that adequate billing records are maintained for all patients and for all patient visits. Billing records shall be made for all methods of payment. Billing records shall be made available to the Department upon request.

Billing records shall include, but not be limited to the following:

- (a) the amount paid for the co-pay and/or remainder of services;
  - (b) method of payment;
  - (c) date of the delivery of services;
  - (d) date of payment; and
  - (e) description of services.
- (2) The certificate holder shall ensure that patient billing records and patient medical records shall be maintained for seven (7) years from the date of the patient's last treatment at the clinic.
  - (3) The certificate holder shall ensure that all health care providers employed by or working at the pain management clinic are properly licensed and certified at all times.
  - (4) The certificate holder shall ensure the delivery of quality care and quality services at the clinic.
  - (5) The certificate holder shall ensure that there is a medical director at each clinic who meets the requirements contained in laws and rules.
  - (6) The certificate holder shall ensure that all monetary transactions at the pain management clinic shall be in accordance with T.C.A. § 63-1-310 which provides that a pain management clinic may accept only a check, credit card or money order in payment for services provided at the clinic; except that payment may be made in cash for a co-pay, coinsurance or deductible when the remainder of the charge for the services will be submitted to the patient's insurance plan for reimbursement.
  - (7) The certificate holder shall ensure that patients have access to their medical records in the event that the clinic closes.

Authority: T.C.A. §§63-1-303, 63-1-306, and 63-1-310.

1200-34-01-.09 Training Requirements.

- (1) Each physician serving as the medical director at a clinic shall meet at least one (1) of the following requirements:
  - (a) Successful completion of a residency program in physical medicine and rehabilitation, anesthesiology, addiction medicine, neurology, neurosurgery, family practice, preventive medicine, internal medicine, surgery, orthopedics or psychiatry approved by the

Accreditation Council for Graduate Medical Education (ACGME) or American Osteopathic Association Bureau of Osteopathic Specialists (AOABOS);

- (b) Board certification in physical medicine and rehabilitation, anesthesiology, addiction medicine, neurology, neurosurgery, family practice, preventive medicine, internal medicine, surgery, orthopedics or psychiatry approved by the ACGME or AOABOS;
  - (c) Subspecialty certification in pain management, hospice and palliative medicine or geriatric medicine recognized by the ABMS or AOABOS with a certificate of added qualification from the Bureau of Osteopathic Specialists;
  - (d) Board certification by the American Board of Pain Medicine;
  - (e) Board certification by the American Board of Interventional Pain Physicians; or
  - (f) Any other subspecialty certification recognized by the Board of Medical Examiners and Board of Osteopathic Examination; or
  - (g) Completion of forty (40) hours of in-person, live-participatory AMA Category I or AOABOS Category I CME course in pain management completed within seven (7) years prior to employment or service with the certificate holder that addresses the following subject areas:
    - 1. the goals of treating both short term and ongoing pain treatment;
    - 2. controlled substance prescribing rules, including controlled substance agreements;
    - 3. drug screening or testing, including usefulness and limitations;
    - 4. the use of controlled substances in treating short-term and ongoing pain syndromes, including usefulness and limitations;
    - 5. evidence-based non-controlled pharmacological pain treatments;
    - 6. evidence-based non-pharmacological pain treatments;
    - 7. a complete pain medicine history and physical examination;
    - 8. appropriate progress note keeping;
    - 9. comorbidities with pain disorders, including psychiatric and addictive disorders;
    - 10. substance abuse and misuse including alcohol and diversion, and prevention of same;
    - 11. risk management;
    - 12. medical ethics.
- (2) Each health care provider providing pain management services at a clinic shall complete ten (10) hours in continuing education courses during each health care provider's licensure renewal cycle which shall be a part of the continuing education requirements established by each of the health care provider's respective boards. The ten (10) continuing education hours shall include, but not be limited to, the following topics relative to pain management:
- (a) prescribing controlled substances;
  - (b) drug screening or testing;

- (c) pharmacological and non-pharmacological pain treatments;
- (d) completing a physical examination and pain medicine history;
- (e) maintaining appropriate progress notes;
- (f) comorbidities with pain disorders; and
- (g) substance abuse and misuse including alcohol and diversion, and prevention of same.

Authority: T.C.A. §63-1-303 and 63-1-306.

1200-34-01-.10 Civil Penalties.

- (1) With respect to any certified pain management clinic, the Department may, in addition to or in lieu of any other lawful disciplinary action, assess a civil penalty for each separate violation of a statute, rule or Commissioner order in accordance with the following schedule:

Violation	Penalty
T.C.A. § 63-1-134	\$0-\$1,000
T.C.A. § 63-1-306	\$0-\$1,000
T.C.A. § 63-1-309	\$0-\$1,000
T.C.A. § 63-1-310	\$0-\$1,000
Rule 1200-34-01-.06	\$0-\$1,000
Rule 1200-34-01-.08	\$0-\$1,000

- (2) Each day of continued violation may constitute a separate violation.
- (3) In determining the amount of any penalty to be assessed pursuant to this rule, the Department may consider such factors as the following:
  - (a) Whether the amount imposed will be a substantial economic deterrent to the violator;
  - (b) The circumstances leading to the violation;
  - (c) The severity of the violation and the risk of harm to the public;
  - (d) The economic benefits gained by the violator as a result of noncompliance;
  - (e) The interest of the public; and
  - (f) The willfulness of the violation.

Authority: T.C.A. §§ 63-1-303 and 63-1-306.

\* If a roll-call vote was necessary, the vote by the Agency on these rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
N/A					

I certify that this is an accurate and complete copy of an emergency rule(s), lawfully promulgated and adopted.

Date: 29 Sept 2011

Signature: \_\_\_\_\_

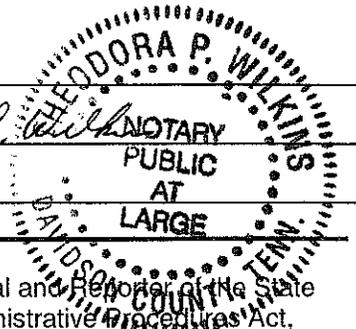
Name of Officer: John J. Dreyzehner, MD, MPH  
Commissioner

Title of Officer: Department of Health

Subscribed and sworn to before me on: 9/29/2011

Notary Public Signature: \_\_\_\_\_

My commission expires on: 11/7/2011



All emergency rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

\_\_\_\_\_

Robert E. Cooper, Jr.  
Attorney General and Reporter

9-30-11

Date

**Department of State Use Only**

Filed with the Department of State on: \_\_\_\_\_

09/30/2011

Effective for: \_\_\_\_\_

180

\*days

Effective through: \_\_\_\_\_

03/28/2012

\* Emergency rule(s) may be effective for up to 180 days from the date of filing.

\_\_\_\_\_

Tre Hargett  
Secretary of State

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SECRETARY OF STATE  
PUBLICATIONS

35

**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: State

DIVISION: Business Services

SUBJECT: Workers' Compensation Exemption Registration and Fees

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 50-6-901 et seq.

EFFECTIVE DATES: September 20, 2011 through March 18, 2012

FISCAL IMPACT: The agency has provided the following fiscal impact information:

Increase State Revenue - \$2,000/Recurring/Employee Misclassification Education and Enforcement Fund

Increase State Expenditures - \$44,700 One-Time/Employee Misclassification Education and Enforcement Fund

Assumptions:  
Based on information provided by the Secretary of State, 100 individuals who are currently listed on the exemption registry will apply. The exemption registry fee is \$20. Such fee will be due every two years. Therefore, an increase in state revenue of \$2,000 (100 X \$20 fee) every two years to the Employee Misclassification Education and Enforcement Fund (EMEEF) beginning in FY11-12.

Program coding for the exemption registry will be required. An increase in one-time state expenditures of \$44,700 for 360 contractor programming hours and 108 contractor analyst coding hours.

STAFF RULE ABSTRACT: This rule implements the workers' compensation exemption registration for additional construction service providers that became effective October 1, 2011, pursuant to Public Chapter 422 of 2011.

### **Impact on Local Governments**

Pursuant to T.C.A. §§4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

If adopted, these rules will not have any impact on the expenditures or revenues of local government.

**Department of State**  
**Division of Publications**  
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**For Department of State Use Only**

Sequence Number: 09-09-11  
 Rule ID(s): 5017  
 File Date (effective date): 09/20/2011  
 End Effective Date: 03/18/2012

# Emergency Rule Filing Form

*Emergency rules are effective from date of filing for a period of up to 180 days.*

<b>Agency/Board/Commission:</b>	Department of State
<b>Division:</b>	Business Services
<b>Contact Person:</b>	Nathan Burton
<b>Address:</b>	312 Rosa L. Parks Ave., Snodgrass Tower, 6 <sup>th</sup> Floor, Nashville, TN
<b>Zip:</b>	37243
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<b>Email:</b>	nathan.burton@tn.gov

**Rule Type:**

Emergency Rule

**Revision Type (check all that apply):**

Amendment  
 New  
 Repeal

**Statement of Necessity:**

Pursuant to T.C.A. §4-5-208(a)(5), the Secretary of State is authorized to promulgate emergency rules when the agency is required by enactment of the general assembly to implement rules within a prescribed period of time that precludes utilization of rulemaking procedures described in Title 4, Chapter 5 for the promulgation of permanent rules. On May 21, 2011 the General Assembly passed SB 1550, which became Tenn. Pub. Acts, ch. 422 (2011) and was signed into law on June 6, 2011. The Act requires changes to the Workers' Compensation Exemption Registration rules effective on October 1, 2011. Further, the Act specifically authorizes the Secretary of State to "make any necessary provisions for the implementation of the act."

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1360-09-01	Workers' Compensation Exemption Registration
Rule Number	Rule Title
1360-09-01-.01	Definitions
1360-09-01-.05	Fees

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

Chapter 1360-09-01  
Workers' Compensation Exemption Registration

Rule 1360-09-01-.01 Definitions is amended by deleting the text of subdivision (h) in its entirety and substituting instead the following language so that, as amended, subdivision (h) shall read as follows:

**1360-09-01-.01 DEFINITIONS.**

- (1) The following terms shall have the respective meanings provided in this rule.
- (a) "Active and in good standing as reflected in the records of the secretary of state" means a corporation, limited liability company, or partnership that is in existence, registered or authorized to transact business in this state as reflected in the records of the secretary of state; and in the case of a corporation, limited liability company, limited liability partnership, or limited partnership, such entity is in good standing with the Tennessee department of revenue.
  - (b) "Board" means the state board for licensing contractors.
  - (c) "Commercial construction project" means any construction project that is not:
    - 1. The construction, erection, remodeling, repair, improvement, alteration or demolition of one, two, three or four family unit residences not exceeding three stories in height or accessory use structures in connection with the residences.
    - 2. The construction, erection, remodeling, repair, improvement, alteration or demolition of any building or structure for use and occupancy by the general public which, pursuant to T.C.A. §62-6-112(f)(2), a small commercial building contractor is authorized to bid on and contract for.
    - 3. Performed by any person, municipality, county, metropolitan government, cooperative, board, commission, district, or any entity created or authorized by public act, private act or general law to provide electricity, natural gas, water, waste water services, telephone service, telecommunications service, cable service, or internet service or any combination thereof, for sale to consumers in any particular service area.
  - (d) "Construction project" means the construction, erection, remodeling, repair, improvement, alteration or demolition of a building, structure or other undertaking; provided that if a general contractor contracts to erect, remodel, repair, improve, alter or demolish multiple buildings, structures or undertakings in one contract, all such buildings, structures or undertakings described in such contract shall constitute one construction project.
  - (e) "Construction services provider" or "provider" means any person or entity engaged in the construction industry.
  - (f) "Corporate officer" or "officer of a corporation" means any person who fills an office provided for in the corporate charter or articles of incorporation of a corporation that in the case of a domestic corporation is formed under the laws of this state pursuant to T.C.A. Title 48, Chapters 11 – 68 or in the case of a foreign corporation is authorized to transact business in this state pursuant to T.C.A. Title 48, Chapters 11 – 68; provided that a domestic or foreign corporation is active and in good standing as reflected in the records of the secretary of state.
  - (g) "Direct labor" means the performance of any activity that would be assigned to the Contracting Group as those classifications are designated by the rate service organization designated by the commissioner of commerce and insurance as provided in T.C.A. §56-5-320, but does not include:
    - 1. Classification code 5604, or any subsequent classification code, for construction executives, supervisors, or foremen that are responsible only for the oversight of laborers.

2. Classification code 5606, or any subsequent classification code, for project managers, construction executives, construction managers and construction superintendents having only administrative or managerial responsibilities for construction projects by exercising operational control indirectly through job supervisors or foremen.

~~(h) "Engaged in the construction industry" means any person or entity assigned to the Contracting Group as those classifications are designated by the rate service organization designated by the commissioner of commerce and insurance as provided in T.C.A. §56-5-320.~~

(h) "Engaged in the construction industry" means any person or entity assigned to the contracting group as those classifications are designated by the rate service organization designated by the Commissioner of Commerce and Insurance as provided in § 56-5-320; provided, where more than one (1) classification applies, the governing classification, as that term is defined by the rate service organization designated by the Commissioner of Commerce and Insurance as provided in § 56-5-320, shall be used to determine whether the person or entity is engaged in the construction industry.

(i) "Family owned business" means a business entity in which members of the same family of the applicant have an aggregate of at least ninety-five percent ownership of such business.

(j) "General contractor" means the person or entity responsible to the owner or developer for the supervision or performance of substantially all of the work, labor, and the furnishing of materials in furtherance of the construction, erection, remodeling, repair, improvement, alteration or demolition of a building, structure or other undertaking and who contracts directly with the owner or developer of the building, structure or other undertaking; "general contractor" includes a prime contractor.

(k) "Good standing with the Tennessee department of revenue" means the secretary of state has received and verified through electronic confirmation or a certificate of tax clearance issued by the commissioner of revenue that a corporation, limited liability company, limited liability partnership, or limited partnership is current on all fees, taxes, and penalties to the satisfaction of the commissioner.

(l) "Member of a limited liability company" means any member of a limited liability company formed pursuant to T.C.A. Title 48, Chapters 201 – 249 that is active and in good standing as reflected in the records of the secretary of state.

(m) "Members of the same family of the applicant" means parents, children, siblings, grandparents, grandchildren, stepparents, stepchildren, stepsiblings, or spouses of such, and includes adoptive relationships.

(n) "Partner" means any person who is a member of an association that is formed by two (2) or more persons to carry on as co-owners of a business or other undertaking for profit and such association is active and in good standing as reflected in the records of the secretary of state.

(o) "Person" means only a natural person and does not include a business entity.

(p) "Registry" means the construction services provider workers' compensation exemption registry established pursuant to this part and maintained by the secretary of state.

(q) "Sole proprietor" means one (1) person who owns a form of business in which that person owns all the assets of such business.

Authority: T.C.A. §§4-5-208, 50-6-901(8) and Tenn. Pub. Acts, ch. 422 (2011).

Rule 1360-09-01-.05 Fees is amended by adding subdivisions (i) and (j) so that, as amended, the additional subdivisions shall read as follows:

**1360-09-01-.05 FEES.**

- (1) The following fees apply to documents issued or filed in writing or online:
  - (a) The fee for the issuance of a construction services provider registration to providers who have not been issued a license by the board is one hundred dollars (\$100).
  - (b) The fee for the issuance of a construction services provider workers' compensation exemption is one hundred dollars (\$100).
  - (c) The fee for the filing of correction information pursuant to T.C.A. §50-6-905(c) is twenty dollars (\$20).
  - (d) The fee for the filing of change of address information pursuant to T.C.A. §50-6-905(d) is twenty dollars (\$20).
  - (e) The fee for the filing of a construction services provider workers' compensation exemption renewal is one hundred dollars (\$100).
  - (f) The fee for the filing of a construction services provider registration renewal to providers who have not been issued a license by the board is one hundred dollars (\$100).
  - (g) The fee for the filing of a revocation pursuant to T.C.A. §50-6-908(a) is twenty dollars (\$20).
  - (h) The fee for the issuance of a copy of the notice issued pursuant to T.C.A. §50-6-905(a)(1) is twenty dollars (\$20).
  - (i) The fee for the issuance of a second or subsequent construction services provider workers' compensation exemption registration is twenty dollars (\$20) per registration.
  - (j) The fee for the filing of a second or subsequent construction services provider workers' compensation exemption renewal is twenty dollars (\$20) per renewal.
- (2) In addition to the fees authorized in subsection (1), the secretary of state is authorized to charge an online transaction fee to cover costs associated with processing payments for applications submitted online.
- (3) To facilitate credit card payment and fee collection the Secretary of State may establish a merchant ID or may cause one to be established in the Department of Labor and Workforce Development specifically for the Employee Misclassification Education and Enforcement Fund. If the merchant ID is established in the Department of Labor and Workforce Development all transaction and other fees associated with credit card payments will be paid directly from the Employee Misclassification Education and Enforcement Fund.

Authority: T.C.A. §§4-5-208, 50-6-912 and Tenn. Pub. Acts, ch. 422 (2011).

I certify that this is an accurate and complete copy of an emergency rule(s), lawfully promulgated and adopted.



My Commission Expires NOV. 7, 2012

Date: 9/8/11

Signature: Tre Hargett

Name of Officer: TRE HARGETT

Title of Officer: SECRETARY OF STATE

Subscribed and sworn to before me on: September 8, 2011

Notary Public Signature: Mona Lee Hart

My commission expires on: Nov. 7 2012

All emergency rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.

Robert E. Cooper, Jr.  
Attorney General and Reporter

9-16-11

Date

**Department of State Use Only**

Filed with the Department of State on: 9/20/11

Effective for: 180 \*days

Effective through: 3/18/12

\* Emergency rule(s) may be effective for up to 180 days from the date of filing.

Tre Hargett

Tre Hargett  
Secretary of State

SECRETARY OF STATE  
ADMINISTRATIVE SERVICES

2011 SEP 20 AM 11:15

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## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Collection Service Board

DIVISION: Regulatory Boards

SUBJECT: Licensure and Examination of Location Managers for Collection Services; Authority to Set Vendor, Examination and Re-examination Fees

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 62-20-108

EFFECTIVE DATES: September 23, 2011 through March 21, 2012

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT: The current rule, which limits the amount examination vendors may charge location manager examination candidates to fifty dollars (\$50.00), is not sufficient to cover vendors' examination administrative costs, given the number of candidates that test each year. As a result, no vendors responded to the board's most recent examination request for proposals, leaving the board without the means to continue administering the location manager licensing program.

This rulemaking deletes the location manager licensing examination and re-examination fees, which are limited to fifty dollars (\$50.00), and instead allows the board to set, by contract with an examination vendor, examination and re-examination fees.

## **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments."

The rules proposed herein will not have an impact on local governments.

33

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Sequence Number: 09-18-11  
 Rule ID(s): 5021  
 File Date (effective date): 09/23/2011  
 End Effective Date: 03/21/2012

# Emergency Rule Filing Form

*Emergency rules are effective from date of filing for a period of up to 180 days.*

<b>Agency/Board/Commission:</b>	Tennessee Collection Service Board
<b>Division:</b>	Division of Regulatory Boards
<b>Contact Person:</b>	Terrance L. Bond
<b>Address:</b>	Office of Legal Counsel 500 James Robertson Parkway Davy Crockett Tower, 1 <sup>st</sup> Floor Nashville, TN
<b>Zip:</b>	37243
<b>Phone:</b>	(615) 741-3072
<b>Email:</b>	terrance.bond@tn.gov

**Rule Type:**

Emergency Rule

**Revision Type (check all that apply):**

Amendment  
 New  
 Repeal

**Statement of Necessity:**

The Tennessee Collection Service Board finds that these rules are necessary in order to allow the board to continue to meet its statutory obligation, pursuant to Tenn. Code Ann. §62-20-108, to provide periodic licensing examinations to collection service location manager candidates. Location managers are statutorily designated to be in active and responsible charge of the business of a collection service in order to ensure that all activities of the collection service comport with the Tennessee Collection Service Act, Tenn. Code Ann. §62-20-101, *et seq.*, other state and federal laws applicable to the credit and collection industry and generally accepted business practices; therefore, the board's ability to continue to provide examinations for and license such individuals is directly related to its ability to fulfill its duty to protect the health, safety and welfare of consumers targeted by collection services. The current rule, which limits the amount examination vendors may charge examination candidates to fifty dollars (\$50.00), is not sufficient to cover vendors' examination administration costs, given the number of candidates that test each year. As a result, no vendors responded to the board's most recent examination Request for Proposals (RFP), leaving the board without the means to continue administering the location manager licensing program.

Chapter Number	Chapter Title
0320-01	Licensing
Rule Number	Rule Title
0320-01-.02	Examinations
0320-01-.03	Fees

Chapter 0320-01

Licensing

Amendments

Rule 0320-01-.02 Examinations is amended by deleting subsection (1) of the rule in its entirety and substituting instead the following so that, as amended, the subsection shall read:

- (1) Upon being approved by the Collection Service Board, the candidate shall apply to the approved, independent educational testing organization, on the form supplied by the testing organization, accompanied by a test fee of fifty dollars (~~\$50.00~~) the testing fee as set by the board, pursuant to its contact with the testing organization, to take the location manager licensing examination.

Authority: Tenn. Code. Ann. §§ 62-20-104 and 62-20-108.

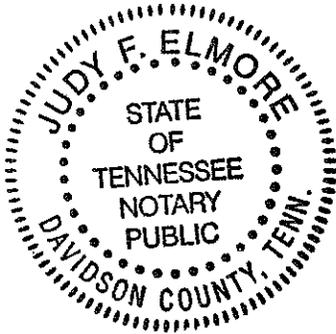
Rule 0320-01-.03 Fees is amended by deleting subsection (3) of the rule in its entirety and substituting instead the following so that, as amended, the subsection shall read:

- (3) In case of failure, ~~the fee for each reexamination shall be fifty dollars (\$50.00);~~ the failing location manager licensing examination candidate shall pay a reexamination fee as set by the board, pursuant to its contract with the testing organization.

Authority: Tenn. Code. Ann. §§ 62-20-104 and 62-20-108.

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Bart Howard	x				
Elizabeth Trinkler	x				
Elizabeth Dixon				x	
James Mitchell	x				

I certify that this is an accurate and complete copy of an emergency rule(s), lawfully promulgated and adopted.



Date: SEPTEMBER 15, 2011

Signature: JAL

Name of Officer: TERANNE L. BEND

Title of Officer: ASSISTANT GENERAL COUNSEL

Subscribed and sworn to before me on: Sept. 15, 2011

Notary Public Signature: Judy F. Elmore

My commission expires on: Jan. 5, 2015

All emergency rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

REC Cooper Jr

Robert E. Cooper, Jr.  
Attorney General and Reporter

9-20-11

Date

Department of State Use Only

Filed with the Department of State on: 9/23/11

Effective for: 180 days

Effective through: 3/21/12

\* Emergency rule(s) may be effective for up to 180 days from the date of filing.

Tre Hargett by Richard C. Underhill, Not

Tre Hargett  
Secretary of State

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SECRETARY OF STATE  
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## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Labor and Workforce Development

DIVISION: Workers' Compensation

SUBJECT: Medical Fee Schedule for Workers' Compensation Claims

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 50-6-204

EFFECTIVE DATES: September 2, 2011 through February 29, 2012

FISCAL IMPACT: The agency has provided the following fiscal impact information:

State and local governments have the option to accept the provisions of the workers' compensation laws pursuant to Tennessee Code Annotated, Section 50-6-106(6), but are not required to do so. For those governmental agencies that do adhere to the medical fee schedule, their workers' compensation premiums should decrease, though it is difficult at this time to ascertain by exactly how much.

### STAFF RULE ABSTRACT:

Pursuant to Tennessee Code Annotated, Section 50-6-204(i), the Commissioner of Labor & Workforce Development is authorized to implement and update a medical fee schedule for services provided to workers' compensation claimants. The medical fee schedule that was implemented in 2005, and has been updated periodically since that time, is based upon a percentage above Medicare rates.

Changes to Medicare rates in 2011 have caused a severe increase in the medical fee schedule rates, which led the National Council on Compensation Insurance ("NCCI") to file a rate increase of 6.3% with the Commissioner of Commerce & Insurance on August 2, 2011. Such a rate increase will result in Tennessee employers paying significantly higher workers' compensation insurance premiums than was originally anticipated.

This emergency rule amendment will alleviate the burden on employers by lessening this sudden increase in their workers' compensation premiums.

## Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

Local governments have the option to accept the provisions of the workers' compensation laws pursuant to T.C.A. § 50-6-106(6), but are not required to do so. For those local governments that do accept the provisions of the workers' compensation laws, the impact of the rule change will be to decrease their workers' compensation insurance premiums.

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**For Department of State Use Only**

Sequence Number: 09-01-11  
 Rule ID(s): 5009  
 File Date (effective date): 09/02/2011  
 End Effective Date: 02/29/2012

# Emergency Rule Filing Form

*Emergency rules are effective from date of filing for a period of up to 180 days.*

<b>Agency/Board/Commission:</b>	Department of Labor and Workforce Development
<b>Division:</b>	Workers' Compensation
<b>Contact Person:</b>	Landon Lackey
<b>Address:</b>	220 French Landing Drive Nashville, Tennessee
<b>Zip:</b>	37243
<b>Phone:</b>	615-532-0370
<b>Email:</b>	landon.lackey@tn.gov

**Rule Type:**

Emergency Rule

**Revision Type (check all that apply):**

Amendment  
 New  
 Repeal

**Statement of Necessity:**

Pursuant to T.C.A. 50-6-204(i), the Commissioner of Labor & Workforce Development is authorized to implement and update a medical fee schedule for services provided to workers' compensation claimants. The medical fee schedule that was implemented in 2005, and has been updated periodically since that time, is based upon a percentage above Medicare rates. Changes to Medicare rates in 2011 have caused a severe increase in the medical fee schedule rates, which led the National Council on Compensation Insurance ("NCCI") to file a rate increase of 6.3% with the Commissioner of Commerce & Insurance on August 2, 2011. Such a rate increase will result in Tennessee employers paying significantly higher workers' compensation insurance premiums than was originally anticipated. At a time when the national and state economies are struggling to recover, it is imperative that the Department take all necessary steps to keep premiums at an appropriate level. Accordingly, this emergency rule amendment will alleviate the burden on employers by lessening this sudden increase in their workers' compensation premiums.

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/RuleTitle per row)**

Chapter Number	Chapter Title
0800-02-18	Medical Fee Schedule
Rule Number	Rule Title
0800-02-18-.02	General Information and Instructions for Use

**RULES  
OF  
TENNESSEE DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
DIVISION OF WORKERS' COMPENSATION**

**CHAPTER 0800-02-18  
MEDICAL FEE SCHEDULE**

**0800-02-18-.02 GENERAL INFORMATION AND INSTRUCTIONS FOR USE.**

(4) (a)

Monetary Conversion Factors are based on the CMS' unit amount in effect on March 4, 2008. These Factors are subject to change based upon any change in the Medicare unit amount. If the Medicare Conversion Factor falls below the unit amount in effect on March 4, 2008, the Department will adjust the Tennessee Medical Fee Schedule Conversion Factors listed on the Division's website to maintain the equivalent maximum allowable reimbursement which would have been allowed had the Medicare Conversion Factor remained at the amount in effect on March 4, 2008. In no event shall reimbursement amounts under this Chapter be less than the amounts applicable on March 4, 2008.

Effective December 1, 2011, practitioner fees shall be based on the most current Tennessee Medicare rates. The conversion factors listed below should be applied to the CPT code in order to calculate the appropriate amount. In no event shall the amount be determined by the practitioner's certification or eligibility status with any specialty board.

<u>Service Category</u>	<u>TN Conversion Factor</u>
<u>Anesthesiology.....</u>	<u>\$75.00 per unit</u>
<u>Surgery</u>	
<u>(Codes 20000-29999 &amp; 61000-64999).....</u>	<u>275% of current Medicare</u>
<u>(all other surgical codes).....</u>	<u>200% of current Medicare</u>
<u>Radiology.....</u>	<u>200% of current Medicare</u>
<u>Pathology.....</u>	<u>200% of current Medicare</u>
<u>Physical/Occupational Therapy.....</u>	<u>130% of current Medicare</u>
<u>Chiropractic.....</u>	<u>130% of current Medicare</u>
<u>General Medicine</u>	
<u>(including evaluation &amp; management).....</u>	<u>160% of current Medicare</u>
<u>Emergency Care.....</u>	<u>130% of current Medicare</u>
<u>Dentistry.....</u>	<u>100% of current Medicare</u>

—(b)

The appropriate conversion factor must be determined by the type of CPT code for the procedure performed in all cases except those involving orthopedic and neurosurgery. Board-eligible and certified neurosurgeons and orthopedic surgeons shall use the separate neurosurgery and orthopedic surgery conversion factors listed on the Division's website for all surgery CPT codes.

Notwithstanding subsection (a) above, if the most current Medicare conversion factor falls below 30.00, then 30.00 shall be used to calculate the amounts in subsection (a) in lieu of the most current Medicare conversion factor until such time as the most current Medicare conversion factor exceeds 30.00.

\* If a roll-call vote was necessary, the vote by the Agency on these rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)

I certify that this is an accurate and complete copy of an emergency rule(s), lawfully promulgated and adopted.

Date: 8/5/11



Signature: Karla Davis

Name of Officer: Karla Davis

Title of Officer: Commissioner of Labor and Workforce Development

Subscribed and sworn to before me on: 8/5/11

Notary Public Signature: Cynthia Ann Key

My commission expires on: 7/23/2012

All emergency rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.  
Robert E. Cooper, Jr.  
Attorney General and Reporter  
8-19-11  
Date

**Department of State Use Only**

Filed with the Department of State on: 09/02/2011

Effective for: 180 \*days

Effective through: 02/29/2012

\* Emergency rule(s) may be effective for up to 180 days from the date of filing.

Tre Hargett  
Tre Hargett  
Secretary of State

## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Labor and Workforce Development  
DIVISION: Occupational Safety and Health  
SUBJECT: Occupational Safety and Health Standards and Exceptions  
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 50-3-201  
EFFECTIVE DATES: February 28, 2012 through June 30, 2012  
FISCAL IMPACT: Minimal

### STAFF RULE ABSTRACT:

Rules 0800-01-01-.06, 0800-01-06-.02, 0800-01-07-.01 and 0800-01-07-.02 are amended in order to adopt and reference the latest occupational safety and health standards and exceptions, if any, in the applicable parts of Title 29, Code of Federal Regulations when published in the Federal Register. Since the last amendments to the rules there have been no changes to the Occupational Safety and Health Standards.

### **Regulatory Flexibility Addendum**

Pursuant to § T.C.A. 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

An economic impact statement regarding the amendments in this rule proposal is not required under the provisions of the Regulatory Flexibility Act of 2007. As stated in Section 6 of Public Chapter 464, "This part shall not apply to rules that are adopted on an emergency or public necessity basis under Title 4, Chapter 5, Part 2, that are federally mandated, or that substantially codify existing state or federal law." Under the statutory authority of 29 U.S.C. § 667, Tennessee has an approved state plan that provides for the development and enforcement of occupational safety and health standards. In accordance with the Tennessee Occupational Safety and Health State Plan, when a federal occupational safety and health standard is promulgated under 29 U.S.C. § 655 Tennessee generally adopts the federal standard relating to the same issue. The plan specifies that the state of Tennessee will adopt the federal standards or an equivalent state requirement within six (6) months of the standard's promulgation by federal OSHA. In addition, T.C.A. §50-3-201 authorizes the Commissioner of Labor and Workforce Development to adopt either state or federal occupational safety and health standards.

### **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

This rule does not have a projected impact on local governments.

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**For Department of State Use Only**

Sequence Number: 09-19-11  
 Rule ID(s): 5022-5024  
 File Date: 09/23/2011  
 Effective Date: 02/28/2012

## Proposed Rule(s) Filing Form

*Proposed rules are submitted pursuant to T.C.A. §4-5-202, 4-5-207 in lieu of a rulemaking hearing. It is the intent of the Agency to promulgate these rules without a rulemaking hearing unless a petition requesting such hearing is filed within sixty (60) days of the first day of the month subsequent to the filing of the proposed rule with the Secretary of State. To be effective, the petition must be filed with the Agency and be signed by twenty-five (25) persons who will be affected by the amendments, or submitted by a municipality which will be affected by the amendments, or an association of twenty-five (25) or more members, or any standing committee of the General Assembly. The agency shall forward such petition to the Secretary of State.*

<b>Agency/Board/Commission:</b>	Department of Labor and Workforce Development
<b>Division:</b>	Division of Occupational Safety and Health
<b>Contact Person:</b>	Jim Cothron
<b>Address:</b>	220 French Landing Drive
<b>Zip:</b>	37243-1002
<b>Phone:</b>	(615) 253-5116
<b>Email:</b>	<a href="mailto:jim.cothron@tn.gov">jim.cothron@tn.gov</a>

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
0800-01-01	Occupational Safety and Health Standards for General Industry
Rule Number	Rule Title
0800-01-01-.06	Adoption and Citation of Federal Standards

Chapter Number	Chapter Title
0800-01-06	Occupational Safety and Health Standards for Construction
Rule Number	Rule Title
0800-01-06-.02	Adoption and Citation of Federal Standards

Chapter Number	Chapter Title
0800-01-07	Occupational Safety and Health Standards for Agriculture
Rule Number	Rule Title
0800-01-07-.01	Adoption and Citation of Federal Standards
0800-01-07-.02	Exceptions to Adoption of Federal Standards

Proposed Amendments with Changes Red-Lined

Chapter 0800-01-01

Rule 0800-01-01-.06 Amended

Paragraph (2) of Rule 0800-01-01-.06 Adoption and Citation of Federal Standards is amended by changing the date from "July 1, 2011" to "January 1, 2012".

Existing Rule:

- (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1910, as of ~~July 1, 2011~~ except as provided in Rule 0800-01-01-.07 of this chapter.

Proposed Amended Rule:

- (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1910, as of January 1, 2012 except as provided in Rule 0800-01-01-.07 of this chapter.

Authority: T.C.A. §§ 4-3-1411 and 50-3-201.

Chapter 0800-01-06

Rule 0800-01-06-.02 Amended

Paragraph (2) of Rule 0800-01-06-.02 Adoption and Citation of Federal Standards is amended by changing the date from "July 1, 2011" to "January 1, 2012".

Existing Rule:

- (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1926, as of ~~July 1, 2011~~ except as provided in Rule 0800-01-06-.03 of this chapter.

Proposed Amended Rule:

- (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1926, as of January 1, 2012 except as provided in Rule 0800-01-06-.03 of this chapter.

Authority: T.C.A. §§ 4-3-1411, 50-3-103 and 50-3-201.

Chapter 0800-01-07

Rule 0800-01-07-.01 Amended

Paragraph (2) of Rule 0800-01-07-.01 Adoption and Citation of Federal Standards is amended by changing the date from "July 1, 2011" to "January 1, 2012".

Existing Rule:

- .. (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1928, as of ~~July 1, 2011~~ except as provided in Rule 0800-01-07-.02 of this chapter.

Proposed Amended Rule:

- (2) The Commissioner of Labor and Workforce Development adopts the federal occupational safety and health standards codified in Title 29, Code of Federal Regulations, Part 1928, as of January 1, 2012 except as provided in Rule 0800-01-07-.02 of this chapter.

Authority: T.C.A. §§4-3-1411 and 50-3-201.

Rule 0800-01-07-.02 Amended

Paragraph (1) of Rule 0800-01-07-.02 Exceptions to Adoption of Federal Standards in 29 CFR Part 1928 is amended by changing the date from "July 1, 2011" to "January 1, 2012".

Existing Rule:

- (1) As of ~~July 1, 2011~~, there are no exceptions.

Proposed Amended Rule:

- (1) As of January 1, 2012, there are no exceptions.

Authority: T.C.A. §§4-3-1411 and 50-3-201.

\* If a roll-call vote was necessary, the vote by the Agency on these rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)

I certify that this is an accurate and complete copy of proposed rules, lawfully promulgated and adopted by the (board/commission/other authority) on 08/12/2011 (date as mm/dd/yyyy), and is in compliance with the provisions of TCA 4-5-222. The Secretary of State is hereby instructed that, in the absence of a petition for proposed rules being filed under the conditions set out herein and in the locations described, he is to treat the proposed rules as being placed on file in his office as rules at the expiration of sixty (60) days of the first day of the month subsequent to the filing of the proposed rule with the Secretary of State.

Date: 8/12/11

Signature: Karla Davis

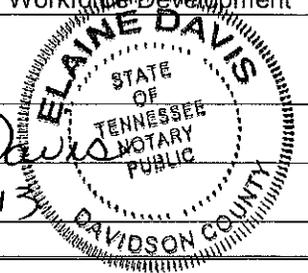
Name of Officer: Karla Davis

Title of Officer: Commissioner of Labor and Workforce Development

Subscribed and sworn to before me on: 8/12/11

Notary Public Signature: Elaine Davis

My commission expires on: 7-8-2013



All proposed rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.

Robert E. Cooper, Jr.  
Attorney General and Reporter

9-19-11

Date

**Department of State Use Only**

Filed with the Department of State on: 9/23/11

Effective on: 2/28/12

Tre Hargett

Tre Hargett  
Secretary of State

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## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation

DIVISION: Underground Storage Tanks

SUBJECT: Dispensers and Systems Containing Petroleum Substances with Greater than 10% Ethanol

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-215-101 *et seq.*

EFFECTIVE DATES: October 9, 2011 through June 30, 2012

FISCAL IMPACT: Minimal

### STAFF RULE ABSTRACT:

Proposed Rule 1200-01 -15-.01 amends the definition of "motor fuel" to clarify that biodiesel and ultra low sulphur diesel are included in the definition.

Rule 1200-01-15-.02 makes it clear that motor fuel dispensers for petroleum substances with greater than 10% ethanol are to be listed by Underwriters Laboratories for dispensing high alcohol content and are to have been manufactured after June 24, 2010.

Part (1)(a)3 of Rule 1200-01 -15-.03 is being added to make it clear that compatibility documentation is required for new systems being installed that contain petroleum substances with greater than 10% ethanol.

Paragraph (2) of Rule 120001-15-.03 and Rule 1200-01-15-.07 are amended to allow "other responsible parties" to close USTs, as are owners and/or operators.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

Comment: A commenter felt the definition of motor fuel should be a standalone rule.

Response: The Board maintains that the definition of motor fuel falls under the Housekeeping rules as it simply clarifies the definition to include new fuel types that are regulated and therefore does not need to be a standalone rule.

Comment: A commenter felt that the requirement for motor fuel dispensers to be UL listed and the requirement that owners of UST systems, containing greater than 10% alcohol, submit documentation of compatibility should both be part of the other proposed rule package.

Response: The motor fuel dispenser requirement is an E85 issue that was addressed by an EPA requirement regarding the new UL Listing and that is the reason it was added to these housekeeping rules.

The compatibility documentation is also an E85 issue. The proposed rules only require verification of compatibility on new installations, as the Division has previously required it as a matter of interpretation of existing rules. The proposed rule does not limit the tank owner from using fuels with greater than 10% ethanol; it simply asks for verification that the components of the new system are compatible. It is the express intent of Tennessee Petroleum Underground Storage Tank Act, at T.C.A. § 68-215-102, to provide for the safe storage of petroleum products. This proposed rule simply verifies that the product stored is compatible with the system components.

Comment: A commenter felt that the UST program does not regulate dispensers and that dispenser requirement should be left out of the Rule change.

Response: The motor fuel dispenser requirement is an E85 issue with regard to the new UL Listing and that is the reason it was added to the housekeeping rules. Also, the existing rules regulate the use of ancillary equipment and the dispenser is part of this ancillary equipment. If the rules did not regulate ancillary equipment, then releases from the dispenser would not be covered by the fund.

### Regulatory Flexibility Addendum

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

- (1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule.

All businesses owning underground storage tanks are affected by the amendment, however the Board does not expect there to be any cost to small businesses or any real benefit. These are basic housekeeping rules, to clarify the existing rules.

- (2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record.

The Board does not anticipate any administrative costs from these basic housekeeping rules, to clarify the existing rules.

- (3) A statement of the probable effect on impacted small businesses and consumers.

The Board does not anticipate any impact on small businesses or consumers. These are basic housekeeping rules.

- (4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business.

There is no burden or cost on the tank owner, so there is no need for an alternative. These are basic housekeeping rules, to clarify the existing rules.

- (5) A comparison of the proposed rule with any federal or state counterparts.

These rule changes are a clarification of the existing rules to bring them more in line with the federal rules.

- (6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Exempting small businesses from all or any part of these clarifying changes to the existing rules would prevent them from having the benefit of the clarifications.

### Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule to proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

(Insert statement here)

The Department anticipates that these amended rules will not have a financial impact on local governments.

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**For Department of State Use Only**

Sequence Number: 07-07-11  
 Rule ID(s): 4964  
 File Date: 07/11/2011  
 Effective Date: 10/09/2011

# Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

**Agency/Board/Commission:** Environment and Conservation  
**Division:** Underground Storage Tanks  
**Contact Person:** Rhonda Key  
**Address:** 4<sup>th</sup> Floor, L & C Tower  
 401 Church Street  
 Nashville, Tennessee  
**Zip:** 37243-1541  
**Phone:** 615-532-0989  
**Email:** [Rhonda.Key@tn.gov](mailto:Rhonda.Key@tn.gov)

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised** (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only **ONE** Rule Number/Rule Title per row)

Chapter Number	Chapter Title
1200-01-15	Underground Storage Tank Program
Rule Number	Rule Title
1200-01-15-.01	Program Scope, Definitions and Proprietary Information
1200-01-15-.02	UST Systems: Installation and Operation
1200-01-15-.03	Notification, Reporting, and Record Keeping
1200-01-15-.07	Out-Of-Service UST Systems and Closure

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://tn.gov/sos/rules/1360/1360.htm>)

Chapter 1200-01-15  
Underground Storage Tank Program

Amendments

Paragraph (4) Definitions of Rule 1200-01-15-.01 Program Scope, Definitions and Proprietary Information is amended by inserting the phrase "biodiesel, ultra low sulphur diesel," between "No. 1 or No. 2 diesel fuel," and "or any grade of gasohol" so that, as amended the definition for Motor Fuel shall read as follows:

"Motor Fuel" means petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, biodiesel, ultra low sulphur diesel, or any grade of gasohol, and is typically used in the operation of a motor engine.

Paragraph (1) of Rule 1200-01-15-.02 UST Systems: Installation and Operation is amended by deleting it in its entirety and replacing it with a new paragraph (1) to read as follows:

- (1) Installation.
  - (a) At least fifteen (15) days prior to the installation of any tank and/or new UST system construction activities at the site, the tank owner shall notify the division in the following manner:
    1. Submit a pre-installation notification form in accordance with rule 1200-01-15-.03(1)(a)1 for all the petroleum underground storage tanks and/or UST systems for which installation and/or construction is planned; and
    2. Submit annual tank fees for all tanks, tank compartments and/or UST systems, which are listed in the pre-installation notification form, in accordance with rule 1200-01-15-.10(3).
  - (b) All tanks and piping shall be installed in accordance with the manufacturer's installation instructions.
  - (c) All tanks, pressurized piping and/or suction piping that ~~does~~ do not meet the requirements of rule 1200-01-15-.04(2)(b)2(i) through (iii), and/or motor fuel dispensers installed on or after July 24, 2007, shall be secondarily contained in accordance with paragraph (2) of this rule.
  - (d) Motor fuel dispensers used for dispensing petroleum substances blended with more than 10% alcohol products by volume must have a listing by Underwriters Laboratories (UL) for dispensing high alcohol content fuels, and must have been manufactured after June 24, 2010.
  - (~~d~~)e) The following requirements take effect when a petroleum product is being placed into a tank, tank compartment and/or UST system either during or following installation:
    1. Petroleum shall not be placed into an underground storage tank, tank compartment and/or UST system until such time as a notification form has been submitted to the Division in accordance with part 1 of subparagraph (a) of this paragraph.
    2. Prior to placing product into the tank, tank compartment and/or UST system, spill and overfill prevention measures shall be implemented in accordance with paragraph (3) of this rule.
    3. Prior to placing product into the tank or tank compartment an air pressure test or a vacuum test shall be conducted in accordance with the manufacturer's recommendations. The results of this test shall be maintained for the operational life of the underground storage tank system. The test results shall contain at a minimum the following information:

- (i) The name of the manufacturer whose pressure test recommendations have been applied to the tank;
  - (ii) The name of the person performing the test and the name of the company that person represents;
  - (iii) The date of the pressure test;
  - (iv) The identification number assigned to the facility by the division;
  - (v) The amount of pressure applied to the tank;
  - (vi) The duration of the test period; and
  - (vii) The results of the test.
4. Begin release detection in accordance with rule 1200-01-15-.04 immediately if the tank or tank compartment contains more than two and one-half (2.5) centimeters (one (1) inch) of product.
  5. Immediately protect against corrosion in accordance with paragraph (4) of this rule.
  6. A line tightness test in accordance with rule 1200-01-15-.04(4)(b) and a tank tightness test in accordance with rule 1200-01-15-.04(3)(c) shall be performed upon completion of the installation and prior to the dispensing of fuel from the UST system. The results of this tightness test shall be maintained for the operational life of the underground storage tank system. Such records shall be transferred in accordance with rule 1200-01-15-.03(2)(d) at the time of ownership transfer.
- (e)(f) Installation shall be certified in accordance with rule 1200-01-15-.03(1)(d)1 within fifteen (15) days following completion of the installation.

Subparagraph (a) of paragraph (1) of Rule 1200-01-15-.03 Notification, Reporting, and Record Keeping is amended by adding new part 3 to read as follows:

3. All owners of UST systems installed to contain a petroleum substance blended with more than 10% alcohol products by volume must submit documentation demonstrating that the UST system is compatible with the product stored, at least fifteen (15) days prior to commencement of installation. Documentation must be submitted in a format established by the Division.

Paragraph (2) of Rule 1200-01-15-.03 Notification, Reporting, and Record Keeping is amended by deleting it in its entirety and replacing it with the following new paragraph (2):

- (2) Reporting and record keeping. Owners, ~~and/or operators,~~ and/or other responsible parties of UST systems shall cooperate fully with inspections, monitoring and testing conducted by the Division, as well as requests for document submission, testing, and monitoring by the owner, ~~and/or operator,~~ and/or other responsible party in accordance with the Tennessee Petroleum Underground Storage Tank Act T.C.A. §68-215-101 et seq.
  - (a) Reporting. Owners, ~~and/or operators,~~ and/or other responsible parties shall submit the following information to the division:
    1. Notification for all UST systems (rule 1200-01-15-.03(1), which includes certification of installation for new UST systems (rule 1200-01-15-.03(1)(d) and (e));

2. Reports of all releases including suspected releases (rule 1200-01-15-.05(1)), spills and overfills (rule 1200-01-15-.05(4)), and confirmed releases (rule 1200-01-15-.06);
  3. Corrective actions planned or taken including, but not limited to, initial response measures (rule 1200-01-15-.06(3)), hazard management measures (rule 1200-01-15-.06(4)), initial site characterization and exposure assessment (rule 1200-01-15-.06(5)), corrective action plan (rule 1200-01-15-.06(10)), and as otherwise directed by the division;
  4. A notification before permanent closure or change-in-service (rule 1200-01-15-.07(3) and (4)); and
  5. Tank closure activities including site assessment results (rule 1200-01-15-.07(5)).
- (b) Record keeping. Owners, ~~and/or operators~~, and/or other responsible parties shall maintain the following information:
1. A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used (rule 1200-01-15-.02(4)(a)5; rule 1200-01-15-.02(4)(b)3);
  2. Documentation of operation of corrosion protection equipment (rule 1200-01-15-.02(4)(c));
  3. Documentation of UST system repairs (rule 1200-01-15-.02(7)(f));
  4. Recent compliance with release detection requirements (rule 1200-01-15-.04(5)); and
  5. Results of the site investigation conducted at permanent closure (rule 1200-01-15-.07(5)).
- (c) Availability and maintenance of records.
1. Owners, ~~and/or operators~~, and/or other responsible parties shall keep the records required either:
    - (i) At the UST site and immediately available for inspection by the division; or
    - (ii) At a readily available alternative site and be provided for inspection to the division upon request; or
    - (iii) In the case of permanent closure records required under rule 1200-01-15-.07(7), owners, ~~and/or operators~~, and/or other responsible parties are also provided with the additional alternative of mailing closure records to the division if they cannot be kept at the site or an alternative site as indicated in subparts (i) or (ii) of this part.
  2. If an inspection is scheduled by the division in advance of the date of that inspection, all records shall be present and available for review during the scheduled inspection.
- (d) Records transfer. Upon transfer of ownership, including, but not limited to, sale of the UST systems, originals and/or copies of all documents required to satisfy the reporting and recordkeeping requirements of this paragraph shall be transferred to the new owner of the USTs at the time of ownership transfer.

Appendix 1200-01-15-.03-A

Statement for shipping tickets and invoices.

Note: A federal law (the Resource Conservation and Recovery Act (RCRA), as amended (Pub. L. 98-616)) requires owners of certain underground storage tanks to notify designated

state or local agencies by May 8, 1986, of the existence of their tanks. The Tennessee Petroleum Underground Storage Tanks Act (T.C.A. § 68-215-101 et seq.) also contains notification requirements. Notifications for tanks brought into use after July 1, 1989 shall be made fifteen (15) days in advance of installation. Consult EPA's regulations, issued on November 8, 1985 (40 CFR Part 280), state law (T.C.A. §68-215-101 et seq.) and state regulations (Chapter 1200-01-15) to determine if you are affected by these laws and regulations.

Rule 1200-01-15-.07 Out-Of-Service UST Systems and Closure is amended by deleting it in its entirety and replacing with the following Rule 1200-01-15-.07:

1200-01-15-.07 Out-Of-Service UST Systems and Closure

(1) Temporary closure.

(a) When an UST system is temporarily closed, owners, operators, and/or other responsible parties shall continue operation and maintenance of corrosion protection in accordance with rule 1200-01-15-.02(4), and any release detection in accordance with rule 1200-01-15-.04. Rule 1200-01-15-.05 and rule 1200-01-15-.06 shall be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST system is empty. The UST system is empty when all materials have been removed using commonly employed practices so that no more than two and one-half (2.5) centimeters (one (1) inch) of residue remains in the system.

(b) When an UST system is temporarily closed for three (3) months or more, owners, ~~and/or~~ operators, and/or other responsible parties shall also comply with the following requirements:

1. Leave vent lines open and functioning;
2. Cap and secure all other lines, pumps, manways, and ancillary equipment; and
3. File an amended notification form showing the tank system as temporarily out of use.

(2) Substandard UST systems. Unless directed to do otherwise by the Division, owners, ~~and/or~~ operators, and/or other responsible parties of an UST system which does not meet the requirements in rule 1200-01-15-.02(3) and (4) shall permanently close the substandard UST system in accordance with paragraphs (4) and (5) of this rule, except that parts (4)(a)6 and 7 of this rule shall not apply to a substandard UST system. ~~The~~ Owners, ~~and/or~~ operators, and/or other responsible parties of a substandard UST system shall complete the permanent closure, including submittal of the Permanent Closure Report, within sixty (60) days of Division approval of the Application for Permanent Closure of Underground Storage Tanks.

(3) Tank compartment closure. For a tank that has more than one (1) tank compartment, one (1) or more of the tank compartments may be permanently closed in accordance with the provisions of this paragraph as well as paragraph (5) of this rule. If all the compartments in a tank are to be permanently closed, the requirements for permanent closure set forth in paragraphs (4) and (5) of this rule shall be followed by the tank owner, ~~and/or~~ operator, and/or other responsible party.

(a) At least thirty (30) days before beginning tank compartment closure, owners, ~~and/or~~ operators, and/or other responsible parties shall apply for tank compartment closure. Application for tank compartment closure shall meet the following requirements:

1. An Application for Closure of Tank Compartment(s) shall be submitted in a format established by the division. The application shall be completed according to the instructions provided by the division.
2. The Application for Closure of Tank Compartment(s) shall be accompanied by a written statement provided by either the tank manufacturer or a Registered Professional Engineer certifying the following:

- (i) The planned closure of the tank compartment(s) will not cause structural damage to the tank; and
  - (ii) The corrosion protection system will continue to function as designed and will continue to effectively prevent corrosion of the tank following completion of the planned closure of the tank compartment(s).
3. The tank owner, and/or operator, and/or other responsible party shall obtain division approval of the Application for Closure of Tank Compartment(s) prior to closing the tank compartment(s).
  4. The application shall constitute a plan for tank compartment(s) closure.
  5. Tank compartment(s) closure activities shall be conducted in accordance with the plan contained in the approved Application for Closure of Tank Compartment(s). If alterations to the plan are required, an amended Application for Closure of Tank Compartment(s) shall be submitted to the division for approval.
  6. The approved Application for Closure of Tank Compartment(s) shall be available for inspection upon request at the petroleum site at the time of tank compartment closure.
  7. Division approval of the Application for Closure of Tank Compartment(s) shall be valid for twelve (12) months following such approval. However, such approval shall not be transferable to another person during that twelve (12) month approval time.
  8. If tank compartment(s) closure is not completed within twelve (12) months, the tank owner, and/or operator, and/or other responsible party shall submit a new Application for Closure of Tank Compartment(s) to the division for approval at least thirty (30) days before beginning tank compartment closure.
- (b) The required site assessment under paragraph (5) of this rule shall be performed after receipt of division approval of the Application for Tank Compartment(s) Closure, but before completion of the tank compartment closure. Results of all samples taken during the closure of the tank compartment must be reported to the department within sixty (60) days of collection. Samples may be taken while the compartments of the underground storage tank system that are not being permanently closed are in operation. However, samples may not be taken while the tank compartment that is being permanently closed is still in operation.
  - (c) To permanently close a tank compartment, owners, and/or operators, and/or other responsible parties shall empty and clean the compartment which is to be closed by removing all liquids and accumulated sludges. All tank compartments taken out of service permanently shall be filled with an inert solid material such as a cement compound, sand, gravel, etc. The inert solid material must have a specific gravity greater than one (1.0).
  - (d) Tank compartment closure activities shall not damage those portions of the underground storage tank system that are not being permanently closed.
  - (e) Tank compartment closure activities shall not cause or allow a release of petroleum from the underground storage tank system into the environment.
  - (f) Paragraphs (4) and (5) of this rule shall be followed when the final tank compartment is permanently closed.
- (4) Permanent closure and changes-in-service.
- (a) At least thirty (30) days before beginning either permanent closure of any portion of an underground storage tank system or a change-in-service under subparagraphs (b) and (c) of this paragraph, owners, and/or operators, and/or other responsible parties shall apply for permanent

closure, unless such action is in response to corrective action. Application for permanent closure or change in service shall meet the following requirements:

1. An Application for Permanent Closure of Underground Storage Tank Systems shall be submitted in a format established by the division. The application shall be completed according to the instructions provided by the division.
  2. The tank owner, ~~and/or operator~~, and/or other responsible party shall obtain division approval of the Application for Permanent Closure prior to permanently closing the UST system or any portion thereof or effecting a change in service of the UST system, unless tank compartment closure is conducted in accordance with paragraphs (3) and (5) of this rule.
  3. The application shall constitute a plan for closure or change in service of the UST system, or any portion thereof.
  4. Change in service or closure activities shall be conducted in accordance with the plan contained in the approved Application for Permanent Closure. If alterations to the plan are required, an amended Application for Permanent Closure shall be submitted to the division for approval.
  5. The approved Application for Permanent Closure of Underground Storage Tank Systems shall be available for inspection upon request at the petroleum site at the time of closure.
  6. Division approval of the Application for Permanent Closure shall be valid for twelve (12) months following such approval. However, such approval shall not be transferable to another person during that twelve (12) month approval time.
  7. If permanent closure or change-in-service is not completed within twelve (12) months, the tank owner, ~~and/or operator~~, and/or other responsible party shall submit a new Application for Permanent Closure to the division for approval at least thirty (30) days before beginning underground storage tank system closure.
- (b) To permanently close a tank, owners, ~~and/or operators~~, and/or other responsible parties shall empty and clean it by removing all liquids and accumulated sludges. All tanks taken out of service permanently shall also be either removed from the ground or filled with an inert solid material such as a cement compound, sand, gravel, etc. The inert solid material shall have a specific gravity greater than 1.0.
- (c) Continued use of an UST system to store a non-regulated substance is considered a change-in-service. Before a change-in-service, owners, ~~and/or operators~~, and/or other responsible parties shall empty and clean the tank by removing all liquid and accumulated sludge and conduct a site assessment in accordance with paragraph (5) of this rule.
- (d) Should an owner, ~~and/or operator~~, and/or other responsible party elect to excavate and remove a tank from the site, such excavation and removal shall be done in accordance with Appendix 1200-01-15-.07-A.
- (e) Once a tank has been excavated, it may be stored on-site or transported off-site for storage or disposal. Excavated tanks which have not been cut into sections for disposal shall be considered in storage and shall at all times, while in storage, be maintained in a vapor-free state and stored in accordance with Appendix 1200-01-15-.07-A.
- (f) Tanks shall not be stored at a UST facility unless they are maintained in a vapor-free state, stored in accordance with Appendix 1200-01-15-.07-A, and one of the following conditions are met:
1. (i) Tanks have been cleaned by removal of all liquids and accumulated sludges; and

- (ii) Tanks have been purged of vapors so that any explosive levels do not exceed twenty percent (20%) of the lower explosive limit for the regulated substance; and
  - (iii) Tanks have an opening or openings installed which comprise a minimum of ten percent (10%) of the total tank surface area. Such openings will not be considered openings if they are in contact or contiguous with the ground or surface on which the tank may be resting; or
- 2. Subparts 1(i) and (ii) of this subparagraph have been complied with and there are no remaining USTs either in use or in a temporarily closed condition at the facility; or
  - 3. Tanks which are removed from a UST facility and are intended for reuse at the same or another facility as USTs may be stored at a UST facility if the owner, and/or operator, and/or other responsible party meets the conditions described in subparts 1(i) and (ii) of this subparagraph, and either removes the tank off-site from a UST facility or puts it back into service within thirty (30) days of excavation.
- (g) Tanks shall be stored in a manner which does not pose safety hazards. Tanks shall be stored in a position with the tank's center of gravity closest to the ground. Tanks shall not be stacked. Tanks shall be secured so that they will not roll or slide across a level or sloping ground surface.

[NOTE: Transportation and disposal of tanks will be subject to all applicable Federal, State, and local laws and regulations concerning the safe transportation and proper disposal of such materials.]

- (5) Assessing the site at tank closure, tank compartment closure or change-in-service. The required site assessment shall be performed after receipt of division approval of either an Application for Permanent Closure of Underground Storage Tank System(s) or an Application for Closure of Tank Compartment(s), but before completion of either the permanent closure, tank compartment closure or a change-in-service. The required site assessment shall be performed in accordance with guidance provided by the division.
- (a) Before permanent closure of a tank or a tank compartment or a change-in service is completed, owners, and/or operators, and/or other responsible parties shall measure for the presence of a release where contamination is most likely to be present at the UST site. Sampling shall meet the following requirements:
    - 1. In selecting sample types, sample locations, and measurement methods, owners, and/or operators, and/or other responsible parties shall consider the method of closure, the nature of the stored substance, the type of backfill, the depth to ground water, and other factors appropriate for identifying the presence of a release.
    - 2. At least one day before samples are taken, the owner, and/or operator, and/or other responsible party shall notify the division concerning the schedule for sample collection.
  - (b) Results of all samples taken during change in service or closure of the underground storage tank system or closure of a tank compartment shall be reported to the division within sixty (60) days of collection. Samples shall not be taken while the underground storage tank system is in operation, except when tank compartment closure is being conducted in accordance with paragraph (3) of this rule. Sample results shall be submitted as an attachment to either a Permanent Closure Report for Underground Storage Tank Systems or a Permanent Closure Report for Tank Compartments.
  - (c) The Permanent Closure Report for Underground Storage Tank Systems shall be submitted in a format established by the division. The Permanent Closure Report for Underground Storage Tank Systems shall be completed in accordance with the instructions provided by the division.

- (d) The Permanent Closure Report for Tank Compartments shall be submitted in a format established by the division. The Permanent Closure Report for Tank Compartments shall be completed in accordance with the instructions provided by the division.
- (e) The report, either the Permanent Closure Report for Underground Storage Tank Systems or the Permanent Closure Report for Tank Compartments, shall include, but not be limited to, the following information:
1. The facility identification number assigned to the facility by the division;
  2. Facility name and address;
  3. An updated post-closure site map;
  4. Sampling, including field screening and laboratory analytical results;
  5. Information concerning the removal, storage and/or disposal of tanks, piping and other ancillary underground equipment; and
  6. Information concerning the removal, remediation and/or disposal of petroleum, petroleum waste, petroleum contaminated soil and/or ground water.
- (f) If contaminated soils, contaminated ground water, or free product as a liquid or vapor is discovered under subparagraph (a) of this paragraph, or by any other manner, owners, ~~and/or~~ operators, and/or other responsible parties shall begin release response and corrective action in accordance with rule 1200-01-15-.06.
- (6) Applicability to previously closed UST systems. When directed by the division, the owner, ~~and/or~~ operator, and/or other responsible party of an UST system permanently closed before December 22, 1988 shall assess the site and close the UST system in accordance with this rule if releases from the UST may, in the judgment of the division, pose a current or potential threat to human health and the environment.
- (7) Closure records. Owners, ~~and/or~~ operators, and/or other responsible parties shall maintain records in accordance with rule 1200-01-15-.03(2) that are capable of demonstrating compliance with closure requirements under this rule. The results of the site assessment required in paragraph (5) of this rule shall be maintained for at least three (3) years after completion of permanent closure or change-in-service in one of the following ways:
- (a) By the owners, ~~and/or~~ operators, and/or other responsible parties who took the UST system out of service;
  - (b) By the current owners, ~~and/or~~ operators, and/or other responsible parties of the UST system site; or
  - (c) By mailing these records to the division if they cannot be maintained at the closed facility.

APPENDIX 1200-01-15-.07 – A  
REMOVAL OF UNDERGROUND TANKS

- (1) Preparation.
- (a) Drain product piping into the tank, being careful to avoid any spillage. Cap or remove product piping.
  - (b) Remove liquids and residues from the tank by using explosion-proof or air-driven pumps. Pump motors and suction hoses shall be bonded to the tank or otherwise grounded to prevent electrostatic ignition hazards. It may be necessary to use a hand pump to remove the last few inches of liquid from the bottom of the tank.

NOTE: (The Federal Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6901 et seq., and the Tennessee Hazardous Waste Management Act (HWMA) Part 1 T.C.A. § 68-212-101 et seq. place restrictions on disposal of certain residues that may be present in some underground storage tanks. Residues from tanks that have held leaded gasoline should be treated with extreme caution. Lead compounds and other residues in the tank may be classified as hazardous wastes).

- (c) Excavate to the top of tank.
  - (d) Remove the fill pipe, gauge pipe, vapor recovery truck connection, submersible pumps, and other tank fixtures. Remove the drop tube, except when it is planned to vapor-free the tank by using an educator. Cap or remove all non-product lines, such as vapor recovery lines, except the vent line. The vent line shall remain connected until the tank is purged. Temporarily plug all other tank openings so that all vapors will exit through the vent line during the vapor-freeing process.
- (2) Purging.
- (a) Remove flammable vapors by one of the methods described in subparagraphs (b) through (e) of this paragraph, or as required by local codes. These methods provide a means for temporary vapor-freeing of the tank atmosphere. However, it is important to recognize that the tank may continue to be a source of flammable vapors even after following the vapor-freeing procedures described in subparagraphs (b) through (e) of this paragraph. For this reason, caution shall always be exercised when handling or working around tanks that have stored flammable or combustible liquids. Before initiating work in the tank area or on the tank, a combustible gas indicator shall be used to assess vapor concentrations in the tank and work area. All work shall be done in accordance with Paragraph (3), "Testing".
  - (b) Vent all vapors from the tank at a minimum height of twelve (12) feet above grade and three (3) feet above any adjacent roof lines until the tank is purged of flammable vapors. The work area shall be free from sources of ignition.
  - (c) Flammable and combustible vapors may be purged with an inert gas such as carbon dioxide (CO<sub>2</sub>) or nitrogen (N<sub>2</sub>). This method is not to be utilized if the tank is to be entered for any reason, as the tank atmosphere will be oxygen deficient. The inert gas is to be introduced through a single tank opening at a point near the bottom of the tank at the end of the tank opposite the vent. When inert gases are used, they shall be introduced under low pressure to avoid the generation of static electricity. When using CO<sub>2</sub> or N<sub>2</sub>, pressures in the tank shall not exceed five (5) pounds per square inch gauge.
- Caution: The process of introducing compressed gases into the tank may create a potential ignition hazard as the result of the development of static electrical charges. The discharging device shall therefore be grounded. Explosions have resulted from the discharging of CO<sub>2</sub> fire extinguishers into tanks containing a flammable vapor-air mixture. CO<sub>2</sub> extinguishers shall not be used for inerting flammable atmospheres.
- (d) If the method described in (c) is not practical, the vapors in the tank may be displaced by adding solid carbon dioxide (dry ice) to the tank in the amount of at least 1.5 pounds per one hundred (100) gallons of tank capacity. The dry ice should be crushed and distributed evenly over the greatest possible area in the tank to promote rapid evaporation. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Therefore, where practical, plug all tank openings except the vent after introducing the solid CO<sub>2</sub> and continue to observe all normal safety precautions regarding flammable or combustible vapors. Make sure that all of the dry ice has evaporated before proceeding.
  - (e) Flammable vapors may be exhausted from the tank by one of two methods of tank ventilation listed below:

1. Ventilation using an eductor-type air mover usually driven by compressed air. The eductor-type air mover shall be properly bonded to prevent the generation and discharge of static electricity. When using this method, the fill (drop) tube shall remain in place to ensure ventilation at the bottom of the tank. Tanks equipped with fill (drop) tubes that are not removable should be purged by this method. An eductor extension shall be used to discharge vapors a minimum of twelve (12) feet above grade and at least three (3) feet above any adjacent roof line.
2. Ventilation with a diffused air blower. When using this purging method, it is imperative that the air-diffusing pipe is properly bonded to prevent the discharge of a spark. Fill (drop) tubes shall be removed to allow proper diffusion of the air in the tank. Air supply should be from a compressor that has been checked to ensure a clean air supply and is free from volatile vapors. Air pressure in the tank shall not exceed five (5) pounds per square inch gauge.

(3) Testing.

- (a) The tank atmosphere and the excavation area are to be regularly tested for flammable or combustible vapor concentrations until the tank is removed from both the excavation and the site. Such tests are to be made with a combustible gas indicator which is properly calibrated according to the manufacturer's instructions and which is thoroughly checked and maintained in accordance with the manufacturer's instructions. Persons responsible for testing shall be completely familiar with the use of the instrument and the interpretation of the instrument's readings.
- (b) The tank vapor space is to be tested by placing the combustible gas indicator probe into the fill opening with the drop tube removed. Readings should be taken at the bottom, middle, and upper portions of the tank, and the instrument should be cleared after each reading. If the tank is equipped with a non-removable fill tube, readings are to be taken through another opening. Liquid product shall not enter the probe. Readings of twenty percent (20%) or less of the lower flammable limit shall be obtained before the tank is considered safe for removal from the ground.
- (c) Tanks purged with an inert gas shall be sampled with an oxygen indicator and the oxygen content shall be considered while interpreting combustible gas indicator results.

(4) Removal.

- (a) After the tank has been freed of vapors and before it is removed from the excavation, plug or cap all accessible holes. One plug shall have a one-eighth of an inch vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. The tank shall always be positioned with this vent plug on top of the tank during subsequent transport and storage.
- (b) Excavate around the tank to uncover it for removal. Remove the tank from the excavation and place it on a level surface. Use wood blocks to prevent movement of the tank after removal and prior to loading on a truck for transportation. Use screwed (boiler) plugs to plug any corrosion holes in the tank shell.
- (c) Precautions shall be taken to assure any vapors left in the tank do not reach a combustible level. If this situation occurs, the tank shall be purged according to paragraph (2) of this appendix.
- (d) Before the tank is removed from the site, the tank atmosphere shall be checked with a combustible gas indicator to ensure that it does not exceed twenty percent (20%) of the lower flammable limit.
- (e) The tank shall be secured on a truck for transportation to the storage or disposal site with the one-eighth of an inch vent hole located at the uppermost point on the tank. Tanks shall be transported in accordance with all applicable local, state, and federal laws and regulations.

- (f) Tanks shall be labeled after removal from the ground but prior to removal from the site. Regardless of the condition of the tank, the label shall contain a warning against certain types of reuse. The former contents and present vapor state of each tank, including vapor-freeing treatment and data shall also be indicated. The label shall be similar to the following in legible letters at least two (2) inches high:

Tank Has Contained Leaded Gasoline\*

Not Vapor Free

Not Suitable For Storage Of Food Or Liquids

Intended For Human Or Animal Consumption

Date Of Removal: Month/Day/Year

\*Or other flammable/combustible liquid. Use the applicable designation, for example, diesel.

Tanks that have held leaded motor fuels (or whose service history is unknown) shall also be clearly labeled with the following information:

Tank Has Contained Leaded Gasoline

Lead Vapors May Be Released If Heat

Is Applied To The Tank Shell

- (5) Storage Of Used Tanks.

Storage Procedures.

- (a) Tanks shall be vapor-freed before being placed in storage. Tanks shall also be free of all liquids and residues. All tank openings shall be tightly plugged or capped, with one plug having a one-eighth of an inch vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. Tanks shall be stored with the vented plug at the highest point on the tank. All tanks shall be labeled.
- (b) Used tanks shall be stored in secure areas where the general public will not have access.

Authority: T.C.A. §§ 68-215-101 et seq. and 4-5-201 et seq.

\* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Mayor Allen Barker				✓	
Jonathan M. Edwards	✓				
Sharon O. Jacobs	✓				
Bhag Kanwar	✓				
John Owsley	✓				
DeAnne Redman	✓				
Larry R. Reynolds	✓				
Jon Roach				✓	
Vacant				✓	

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Petroleum Underground Storage Tank Board on 04/27/2011, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 11/23/10

Rulemaking Hearing(s) Conducted on: (add more dates). 01/20/11

Date: April 27, 2011

Signature: *Jonathan M. Edwards*

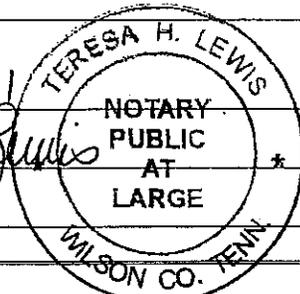
Name of Officer: Jonathan M. Edwards

Title of Officer: Chairman

Subscribed and sworn to before me on: April 27, 2011

Notary Public Signature: *Teresa H. Lewis*

My commission expires on: Nov. 28, 2011



All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

*Robert E. Cooper, Jr.*  
 Robert E. Cooper, Jr.  
 Attorney General and Reporter  
7-7-11

Date

Department of State Use Only

Filed with the Department of State on: 7/11/11

Effective on: 10/9/11

*Tre Hargett by [Signature]*

Tre Hargett  
Secretary of State

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## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation

DIVISION: Radiological Health

SUBJECT: Facilities Handling, Storing and Disposing of Radioactive Materials

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-201 et seq.

EFFECTIVE DATES: December 6, 2011 through June 30, 2012

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT: This rulemaking affects Rule Chapter 1200-02-04 and 1200-02-10. Its various additions and modifications incorporate:

- (1) Revising the Division's transportation regulations to be compatible with the latest version of the International Atomic Energy Agency (IAEA) Standards;
- (2) Adding recordkeeping requirements for the decommissioning of a facility; and
- (3) Revising rules concerning baseline dates for registered inspections.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

Comment: A purpose and scope need to be added to rule 1200-02-10-.30.

Response: The Department agrees.

Comment: "49 CFR 173.401-435" needs to be deleted from rule 1200-02-10-.30(14)(a)1.

Response: The Department agrees.

Comment: Rule 1200-02-10-.30(21) limits the licensee's notification to Tennessee's governor or governor's designee. The Division needs to revise this paragraph to include the concept that the advance notification includes each state within or through which the shipment is transported.

Response: The Department agrees.

### Regulatory Flexibility Addendum

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

The foregoing amendments to Rule Chapters 1200-02-04 and 1200-02-10 are to comply with 10 CFR 20, 30, 40, 70, and 71 of the Nuclear Regulatory Commission's regulations in order for the State to maintain the status of an Agreement State. Amendments to Rules 1200-02-04-.04, 1200-02-04-.13, 1200-02-10-.12, 1200-02-10-.17, 1200-02-10-.26, and 1200-02-10-.30 are federally mandated. With the one exception listed below, the amendments identified above substantially codify existing federal law, and are, therefore, exempt from the requirements of T.C.A §§ 4-5-401 et seq.

Amendments to Rule 1200-02-10-.24 Registration are Department initiated and are not federally mandated. These amendments revise rules concerning baseline dates for registered inspections.

- (1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule:

The amended rules will affect small businesses in the possession of x-ray equipment that have a registered inspector perform their state inspection. The estimated number of small businesses included under these rules is approximately 1000 facilities.

- (2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record:

There are no significant additional reporting, recordkeeping or administrative costs as a result of the amendments.

- (3) A statement of the probable effect on impacted small businesses and consumers:

There is no expected adverse affect on small businesses as a result of these amendments. These amendments are being made to help the Division with the administration of the registered inspection program.

- (4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business:

The Department is unaware of alternatives to the proposed rules.

- (5) A comparison of the proposed rule with any federal or state counterparts:

There is no exact match with any federal or state counterparts. These rule changes are specifically designed to meet the specific needs of the Department

- (6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

There is no expected exemption of small businesses as a result of these amendments or effect thereof.

## Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Department does not anticipate that these amended rules will have a financial impact on local governments.

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Sequence Number: 09-04-11  
Rule ID(s): 5010-5011  
File Date: 09/07/2011  
Effective Date: 12/06/2011

# Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

<b>Agency/Board/Commission:</b>	Environment and Conservation
<b>Division:</b>	Radiological Health
<b>Contact Person:</b>	Beth Murphy
<b>Address:</b>	3 <sup>rd</sup> Floor L&C Annex 401 Church Street Nashville, Tennessee
<b>Zip:</b>	37243-1532
<b>Phone:</b>	(615) 532-0392
<b>Email:</b>	<a href="mailto:beth.murphy@tn.gov">beth.murphy@tn.gov</a>

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1200-02-04	General Provisions
Rule Number	Rule Title
1200-02-04-.04	Definitions
1200-02-04-.13	Deliberate Misconduct

Chapter Number	Chapter Title
1200-02-10	Licensing and Registration
Rule Number	Rule Title
1200-02-10-.12	General Requirements for the Issuance of Specific Licenses
1200-02-10-.17	Expiration and Termination of Licenses and Decommissioning of Sites and Separate Buildings or Outdoor Areas
1200-02-10-.24	Registration
1200-02-10-.26	Records
1200-02-10-.30	Packaging and Transportation of Radioactive Material

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

Chapter 1200-02-04  
General Provisions

Amendments

Subparagraph (u) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (u) shall read as follows:

- (u) 'Fissile material' means ~~plutonium-238, the radionuclides: plutonium-239, plutonium-241, uranium-233, uranium-235 or any combination of these radionuclides. Fissile material does not apply to unirradiated natural uranium and depleted uranium, and natural uranium or depleted uranium that has been irradiated in a thermal reactor.~~ Fissile material means the fissile nuclides themselves, not material containing fissile nuclides. Unirradiated natural uranium and depleted uranium, and natural uranium or depleted uranium that has been irradiated in thermal reactors only, are not included in this definition. Certain exclusions from fissile material controls are provided in 1200-02-10-.30(5)(b).

Subparagraph (bb) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (bb) shall read as follows:

- (bb) 'Low specific activity (LSA) material' means radioactive material with limited specific activity which is nonfissile or is excepted under 1200-02-10-.30(5)(b), and which ~~that~~ satisfies the following descriptions and limits set forth below. Shielding materials surrounding the LSA material may not be considered in determining the estimated average specific activity of the package contents. LSA material must be in one of three groups:
1. LSA-I.
    - (i) Uranium and thorium ores, concentrates of uranium and thorium ores, and other ores containing only naturally occurring radioactive radionuclides (~~e.g. uranium, thorium~~) and uranium or thorium concentrates of these ores which are not intended to be processed for the use of these radionuclides; or
    - (ii) Solid unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures; or
    - (iii) Radioactive material, ~~other than fissile material,~~ for which the  $A_2$  value is unlimited; or
    - (iv) ~~Mill tailings, contaminated earth, concrete, rubble, other debris and activated material in which the radioactive material is essentially uniformly distributed and the average specific activity does not exceed 1 (E-6)  $A_2$ /gram.~~ Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the value for exempt material activity concentration determined in accordance with Schedule 10-6 in the Appendix of Chapter 1200-02-10.
  2. LSA-II.
    - (i) Water with tritium concentration up to 0.8 TBq/liter (20.0 Ci/liter); or
    - (ii) Other material in which the ~~radioactive material~~ activity is distributed throughout, and the average specific activity does not exceed 1(E-4)  $A_2$ /g for solids and gases, and 1(E-5)  $A_2$ /g for liquids.

3. LSA-III. Solids (e.g., consolidated wastes, activated materials), excluding powders, that satisfy the requirements of the U.S. NRC regulations 10 CFR 71.77, in which:
  - (i) The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.); and
  - (ii) The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that even under loss of packaging, the loss of radioactive material per package by leaching, when placed in water for seven days, would not exceed  $0.1 A_2$ ; and
  - (iii) The estimated average specific activity of the solid does not exceed  $2(E-3) A_2/g$ .

Subparagraph (II) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (II) shall read as follows:

- (II) 'Package' means the packaging together with its radioactive contents as presented for transport.
  1. 'Fissile material package' or Type AF package, Type BF package, Type B(U)F package or Type B(M)F package means a fissile material packaging together with its fissile material contents.
  2. 'Type A package' means a Type A packaging together with its radioactive contents. A Type A package is defined and must comply with the U.S. DOT regulations in 49 CFR 173.
  3. 'Type B package' means a Type B packaging together with its radioactive contents. On approval by the USNRC, a Type B package design is designated by the USNRC as B(U) unless the package has a maximum normal operating pressure of more than 700 kPa (100 lbs/in<sup>2</sup>) gauge or a pressure relief device that would allow the release of radioactive material to the environment under the tests specified in USNRC regulations 10 CFR 71.73 (hypothetical accident conditions), in which case it will receive a designation B(M). B(U) refers to the need for unilateral approval of international shipments; B(M) refers to the need for multilateral approval of international shipments. There is no distinction made in how packages with these designations may be used in domestic transportation. To determine their distinction for international transportation, see USDOT regulations in 49 CFR 173. A Type B package approved before September 6, 1983, was designated only as Type B. Limitations on its use are specified in 10 CFR 71.4319.

Subparagraph (bbb) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (bbb) shall read as follows:

- (bbb) 'Special form radioactive material' means radioactive material that satisfies the following conditions:
  1. It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;
  2. The piece or capsule has at least one dimension not less than 5 mm (0.2 in); and
  3. It satisfies the test requirements specified by the U.S. Nuclear Regulatory Commission 10 CFR 71.75. A special form encapsulation designed in accordance with the U.S. NRC requirements of 10 CFR 71.4 in effect on June 30, 1983 (see 10 CFR 71, revised as of January 1, 1983), and constructed before July 1, 1985, and a special form encapsulation designed in accordance with U.S. NRC requirements of 10 CFR 71.4 in effect on March 31, 1996, (see 10 CFR 71, revised as of January 1, 1983), and constructed before April 1, 1998, may continue to be used. Any other special form encapsulation shall meet the

specifications of this definition applicable at the time of its design or construction.

Subparagraph (eee) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (eee) shall read as follows:

(eee) 'Surface contaminated object (SCO)' means a solid object that is not itself classed as radioactive material but which has radioactive material distributed on any of its surfaces. SCO must be in one of two groups with surface activity shall not exceeding the following limits:

1. SCO-I: A solid object on which:
  - (i) The removable (non-fixed) contamination on the accessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 1 E-4 microcurie (4 becquerels) per square centimeter (cm<sup>2</sup>) for beta and gamma and low toxicity alpha emitters or 1 E-5 microcuries (0.4 becquerel) per cm<sup>2</sup> for all other alpha emitters;
  - (ii) The fixed contamination on the accessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 1 microcurie (4 E+4 becquerels) per square centimeter (cm<sup>2</sup>) for beta and gamma and low toxicity alpha emitters or 0.1 microcurie (4 E+3 becquerels) per cm<sup>2</sup> for all other alpha emitters; and
  - (iii) The removable (nonfixed) contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 1 microcurie (4 E+4 becquerels) per square centimeter (cm<sup>2</sup>) beta and gamma and low toxicity alpha emitters or 0.1 microcurie (4 E+3 becquerels) per cm<sup>2</sup> for all other alpha emitters.
2. SCO-II: A solid object on which the limits for SCO-I are exceeded and on which:
  - (i) The removable (nonfixed) contamination on the accessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 1 E-2 microcurie (400 becquerels) per square centimeter (cm<sup>2</sup>) for beta and gamma and low toxicity alpha emitters or 1 E-3 microcurie (40 becquerels) per cm<sup>2</sup> for all other alpha emitters;
  - (ii) The fixed contamination on the accessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 20 microcuries (8 E+5 becquerels) per square centimeter (cm<sup>2</sup>) for beta and gamma and low toxicity alpha emitters or 2 microcuries (8 E+4 becquerels) per cm<sup>2</sup> for all other alpha emitters; and
  - (iii) The removable (nonfixed) contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 20 microcurie (8 E+5 becquerels) per square centimeter (cm<sup>2</sup>) for beta and gamma and low toxicity alpha emitters or 2 microcurie (8 E+4 becquerels) per cm<sup>2</sup> for all other alpha emitters.

Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by adding new subparagraphs (sss) through (gggg) so that subparagraphs (sss) through (gggg) shall read as follows:

(sss) 'Certificate holder' means a person who has been issued a certificate of compliance or other package approval by the U.S. Nuclear Regulatory Commission (U.S. NRC).

(ttt) 'Certificate of Compliance (CoC)' means the certificate issued by the U.S. NRC under 10 CFR 71 SS-7039 (July 2010)

subpart D which approves the design of a package for the transportation of radioactive material.

- (uuu) 'Close reflection by water' means immediate contact by water of sufficient thickness for maximum reflection of neutrons.
- (vvv) 'Consignment' means each shipment of a package or groups of packages or load of radioactive material offered by a shipper for transport.
- (www) 'Containment system' means the assembly of components of the packaging intended to retain the radioactive material during transport.
- (xxx) 'Criticality safety index (CSI)' means the dimensionless number (rounded up to the next tenth) assigned to and placed on the label of a fissile material package, to designate the degree of control of accumulation of packages containing fissile material during transportation. Determination of the criticality safety index is described in 1200-02-10-.30(10), (11), and 10 CFR 71.59.
- (yyy) 'Deuterium' means, for the purposes of 1200-02-10-.30(5)(b) and 1200-02-10-.30(10), deuterium and any deuterium compounds, including heavy water, in which the ratio of deuterium atoms to hydrogen atoms exceeds 1:5000.
- (zzz) 'DOT' and 'U.S. DOT' mean the United States Department of Transportation. U.S. DOT regulations are found in Code of Federal Regulations Title 49 Transportation.
- (aaaa) 'Graphite' means, for the purposes of 1200-02-10-.30(5)(b) and 1200-02-10-.30(10), graphite with a boron equivalent content less than 5 parts per million and density greater than 1.5 grams per cubic centimeter.
- (bbbb) 'Licensed material' means radioactive, by-product, source, or special nuclear material received, possessed, used, or transferred under a general or specific license issued by the Division pursuant to the regulations in this chapter, or issued by the U.S. NRC or an agreement state pursuant to equivalent regulations.
- (cccc) 'Optimum interspersed hydrogenous moderation' means the presence of hydrogenous material between packages to such an extent that the maximum nuclear reactivity results.
- (dddd) 'Spent nuclear fuel or Spent fuel' means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least 1 year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.
- (eeee) 'State' means a state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.
- (ffff) 'SRPAR' means State Regulations for Protection Against Radiation.
- (gggg) 'Unirradiated uranium' means uranium containing not more than  $2E+3$  Bq of plutonium per gram of uranium-235, not more than  $9E+6$  Bq of fission products per gram of uranium-235, and not more than  $5E-3$  g of uranium-236 per gram of uranium-235.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-04-.13 Deliberate Misconduct is amended by deleting the rule and substituting the following so that Rule 1200-02-04-.13 shall read as follows:

- (1) ~~Any licensee, registrant, applicant for a license or registration, employee of a licensee, registrant or applicant, or any contractor (including a supplier or consultant), subcontractor, employee of a contractor or subcontractor of any licensee or registrant or applicant for a license or registration is subject to this rule. This rule applies to any—~~
- (a) Licensee or registrant;
  - (b) Certificate holder;
  - (c) Quality assurance program approval holder;
  - (d) Applicant for a license, certificate, or quality assurance program approval;
  - (e) Contractor (including a supplier or consultant) or subcontractor, to any person identified in subparagraph (1)(d) of this rule; or
  - (f) Employees of any person identified in subparagraphs (1)(a) through (1)(e) of this rule.
- (2) A person identified in paragraph (1) of this Rule who knowingly provides to any ~~licensee, registrant, applicant, contractor or subcontractor,~~ entity, listed in subparagraphs (1)(a) through (1)(e) of this rule, any components, equipment, materials, or other goods or services that relate to a licensee's, registrant's, certificate holder's, quality assurance program approval holder's, or applicant's activities under these regulations, shall not:
- (a) Engage in deliberate misconduct that causes or would have caused, if not detected, a licensee, registrant, certificate holder, quality assurance program approval holder, or any applicant to be in violation of any rule, regulation or order; or any term, condition, or limitation of any license, ~~or~~ registration, or certificate issued by the Division; or
  - (b) Deliberately submit to the Division, a licensee, a registrant, a certificate holder, a quality assurance program approval holder, an applicant for a license or registration, certificate, or quality assurance program approval, or a licensee's, registrant's, applicant's, certificate holder's, or quality assurance program approval holder's contractor or subcontractor, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the Division.
- (3) A person who violates subparagraph 1200-02-04-.13(2)(a) or (b) may be subject to possible civil and criminal penalties.
- (4) For the purposes of subparagraph 1200-02-04-.13(2)(a), deliberate misconduct by a person means an intentional act or omission that the person knows:
- (a) Would cause a licensee, registrant, certificate holder, quality assurance program approval holder, or applicant for a license, registration, certificate, or quality assurance program approval to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license, ~~or~~ registration, or certificate issued by the Division; or
  - (b) Constitutes a violation of a requirement, procedure, instruction, contract, purchase order or policy of a licensee, registrant, certificate holder, quality assurance program approval holder, applicant, or the contractor or subcontractor of any of them.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Chapter 1200-02-10  
Licensing and Registration

Amendments

Paragraph (4) of Rule 1200-02-10-.12 General Requirements for the Issuance of Specific Licenses is amended by adding subparagraph (n) so that, subparagraph (n) shall read as follows:

- .. (n) Each person licensed under this chapter shall keep records of information important to the decommissioning of a facility in an identified location until the site is released for unrestricted use. Before licensed activities are transferred or assigned in accordance with 1200-02-10-.16, a licensee shall transfer all records described in this paragraph to the new licensee. In this case, the new licensee will be responsible for maintaining these records until the license is terminated. If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used. Information the Division considers important to decommissioning consists of:
1. Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site (These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.);
  2. As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination (If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.);
  3. Except for areas containing only sealed sources (provided the sources have not leaked or no contamination remains after any leak) or byproduct materials having only half-lives of less than 65 days, a list contained in a single document and updated every 2 years, of the following:
    - (i) All areas designated and formerly designated restricted areas as defined in paragraph (62) of Rule 1200-02-05-.32;
    - (ii) All areas outside of restricted areas that require documentation under part (4)(n)1 of Rule 1200-02-10-.12;
    - (iii) All areas outside of restricted areas where current and previous wastes have been buried as documented under Rule 1200-02-05-.137; and
    - (iv) All areas outside of restricted areas that contain material such that, if the license expired, the licensee would be required to either decontaminate the area to meet the criteria for decommissioning in Rule 1200-02-10-.36, or apply for approval for disposal under Rule 1200-02-05-.121.
  4. Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subparagraph (d) of paragraph (3) of Rule 1200-02-10-.17 Expiration and Termination of Licenses and Decommissioning of Sites and Separate Buildings or Outdoor Areas is amended by adding part 3 so that the new part shall read as follows:

3. Records required by paragraphs (4) and (6) of Rule 1200-02-10-.26 have been received.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

SS-7039 (July 2010)

Subpart (i) of Part 1 of subparagraph (d) of paragraph (3) of Rule 1200-02-10-.24 Registration is amended by deleting subpart (i) and substituting the following so that, as amended, subpart (i) shall read as follows:

- (i) For purposes of the eighteen percent (18%) fee, the first inspection performed on an x-ray tube on or after ~~January 1, 2003~~ the effective date of these rules, will establish a new baseline date for that tube. Previous baseline dates will be reset to the last day of the month of performance of the previous inspections.
  - (I) Each subsequent inspection of a tube shall be performed ~~within 30 days of the appropriate anniversary of the baseline date~~ during the same month as the preceding inspection or the month immediately following, resulting in "baseline periods" of from 59 days to 62 days, depending upon applicable new 2 month periods, according to the schedule set out in subparagraph (3)(a) of Rule 1200-02-10-.27~~(3)(a)~~.
  - (II) An inspection performed ~~more than 30 days before~~ prior to or after the ~~appropriate baseline date~~ applicable new 2 month period shall establish a new baseline date for that tube.
  - (III) An inspection performed ~~more than 30 days~~ after the applicable new two month period ~~a baseline date~~ shall not qualify the registrant for the eighteen percent (18%) fee.
  - (IV) An inspection performed ~~more than 30 days before a baseline date~~ prior to the applicable new 2 month period and meeting all other requirements found in paragraphs (3), (4) and (5) of Rule 1200-02-10-.27~~(3), (4) and (5)~~ shall qualify the registrant for the eighteen percent (18%) fee.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-10-.26 Records is amended by adding paragraph (6) so that the new paragraph (6) shall read as follows:

- (6) Prior to license termination, each licensee shall forward the records required by subparagraph (4)(n) of Rule 1200-02-10-.12 to the Division.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-10-.30 Packaging and Transportation of Radioactive Material is amended by deleting the rule in its entirety and substituting the following so that, as amended, Rule 1200-02-10-.30 shall read as follows:

1200-02-10-.30 Packaging and Transportation of Radioactive Material

- (1) This rule establishes requirements for packaging, preparation for shipment, and transportation of radioactive material and applies to any licensee or registrant authorized by specific or general license to receive, possess, use, or transfer licensed material, if the person delivers that material to a carrier for transport, transports the material outside the site of usage as specified in the license, or transports that material on public highways. This rule does not authorize possession of licensed material.
- (2) Except as authorized in a general license or a specific license issued by the Division, or as exempted in this rule, no licensee may:
  - (a) Deliver licensed material to a carrier for transport; or
  - (b) Transport licensed material.

- (2)(3) Any application by physicians as defined in subparagraph (1)(nn) of Rule 1200-02-04-.04(1)(nn) for an amendment to a specific license may be submitted to the Division to request specific conditions to their license to transport radioactive material in the course of their practice of medicine. is exempt from paragraph (4) of Rule 1200-02-10-.30 with respect to transport by the physician of licensed material for use in the practice of medicine. However, any physician operating under this exemption must be licensed under Chapter 1200-02-07 or 10 CFR part 35.
- (3)(4) A licensee who, under a general or specific license, transports licensed material outside its site of authorized use or on public highways, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of this rule and with the applicable requirements of the U.S. DOT regulations in 49 CFR parts 107, 170 171 through 180, and 390 through 397, appropriate to the mode of transport.
- (a) The licensee shall particularly note U.S. DOT in the following areas:
1. Packaging: 49 CFR part 173, subparts A and B and I;
  2. Marking and labeling: 49 CFR 172, subpart D, 172.400 through 172.407, and 172.436 through 172.440-172.441 and of subpart E;
  3. Placarding: 49 CFR part 172, subpart F, especially 172.500 through 172.519, 172.556 and appendices B and C;
  4. Accident reporting: 49 CFR part 171, 171.15 and 171.16;
  5. Shipping papers and emergency information: 49 CFR part 172, subparts C and G;
  6. Hazardous material employee training: 49 CFR part 172, subpart H; and
  7. Hazardous material shipper/carrier registration: 49 CFR part 107, subpart G-; and
  8. Security plans: 49 CFR part 172, subpart I.
- (b) The licensee shall also note U.S. DOT regulations pertaining to the following modes of transportation:
1. Rail: 49 CFR part 174, subparts A through D and K;
  2. Air: 49 CFR part 175;
  3. Vessel: 49 CFR part 176, subparts A through F and M; and
  4. Public highway: 49 CFR part 177 and parts 390 through 397.
- (4)(5) If U.S. DOT regulations are not applicable to a shipment of licensed material, the licensee shall conform to the standards and requirements of the U.S. DOT specified above in subparagraph (3)(a) to the same extent as if the shipment or transportation were subject to U.S. DOT regulations. A request for modification, waiver or exemption from those requirements, and any notification referred to in those requirements, shall be filed with, or made to, the Director of the Division of Radiological Health at the address given in Rule 1200-02-04-.07.
- (5)(6) Exemptions for low-level materials.
- (a) Exemption for low-level materials.
1. A licensee is exempt from all requirements of this rule with respect to shipment or carriage of a package containing radioactive material having a specific activity not greater than 0.002  $\mu\text{Ci/g}$  (70 Bq/g); the following low-level materials:

- (i) Natural material and ores containing naturally occurring radionuclides that are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in Table A-2 of Schedule 10-6 in the Appendix to Chapter 1200-02-10; and
  - (ii) Materials for which the activity concentration is not greater than the activity concentration values specified in Table A-2 of Schedule 10-6, or for which the consignment activity is not greater than the limit for an exempt consignment found in Table A-2 of Schedule 10-6 in the Appendix to Chapter 1200-02-10.
2. A licensee is exempt from all requirements of this rule other than paragraphs (4), (5) and (15) of Rule 1200-02-10-30~~(3) and (4) and (10)~~, with respect to shipment or carriage of the following packages, provided the packages contain no fissile material or the fissile material exemption standards of subparagraph (6)(b) or Rule 1200-02-10-30 or 10 CFR ~~74.53~~ 71.15 are satisfied:
- (i) A package containing no more than a Type A quantity of radioactive material;
  - (ii) A package in which the only radioactive material is low specific activity (LSA) material or surface contaminated objects (SCO), provided the external radiation level at 3 meters from the unshielded material or objects does not exceed 10 mSv/h (1 rem/h); or
  - (iii) A package transported within locations within the United States that contains ~~only americium or plutonium~~ in special form with an aggregate radioactivity not to exceed 20 curies (.74 TBq).
3. A licensee is exempt from all requirements of this rule other than paragraphs (4), (5) and (15) or Rule 1200-02-10-30~~(3) and (4) and (10)~~, with respect to shipment or carriage of low-specific-activity (LSA) material in group LSA-I, or surface contaminated objects (SCO's) in group SCO-I.
- (b) Exemption from classification as fissile material.
1. Fissile material meeting the requirements of at least one of the subparts (i) through (vi) of this part are exempt from classification as fissile material and from the fissile material package standards of 10 CFR 71.55 and 71.59, but are subject to all other requirements of this rule, except as noted;
- (i) Individual package containing 2 grams or less fissile material;
  - (ii) Individual or bulk packaging containing 15 grams or less of fissile material provided the package has at least 200 grams of solid nonfissile material for every gram of fissile material. Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but must not be included in determining the required mass for solid nonfissile material;
  - (iii) (I) Low concentrations of solid fissile material commingled with solid nonfissile material, provided that:
    - I. There is at least 2000 grams of solid nonfissile material for every gram of fissile material, and
    - II. There is no more than 180 grams of fissile material distributed within 360 kg of contiguous nonfissile material;
  - (II) Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but must not be included in determining the required mass of solid nonfissile material;

- (iv) Uranium enriched in uranium-235 to a maximum of 1 percent by weight, and with total plutonium and uranium-233 content of up to 1 percent of the mass of uranium-235, provided that the mass of any beryllium, graphite, and hydrogenous material enriched in deuterium constitutes less than 5 percent of the uranium mass;
- (v) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 percent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 percent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2. The material must be contained in at least a DOT Type A package; and
- (vi) Packages containing, individually, a total plutonium mass of not more than 1000 grams, of which not more than 20 percent by mass may consist of plutonium-239, plutonium-241, or any combination of these radionuclides.

~~(6)~~(7) General license: U.S. NRC-approved package.

- (a) A general license is hereby issued to any licensee of the Division to transport, or to deliver to a carrier for transport, licensed material in a package for which a license, certificate of compliance or other approval has been issued by the U.S. Nuclear Regulatory Commission.
- (b) This general license applies only to a licensee who:
  1. Has a copy of the certificate of compliance, or other approval of the package, and has the drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken before shipment;
  2. Complies with the terms and conditions of the license, certificate, or other approval, as applicable, and the applicable requirements of Subparts A, G and H of 10 CFR 71;
  3. Submits in writing to the Director, Division of Radiological Health, at the address given in Rule 1200-02-04-.07, before the licensee's first use of the package, the licensee's name and license number and the package identification number specified in the package approval; and
  4. Has submitted to the Division and received Division approval for a quality assurance program that satisfies the provisions found in Subpart H of 10 CFR 71.
- (c) This general license applies only when the package approval authorizes use of the package under this general license.
- (d) For a Type B or fissile material package, the design of which was approved by U.S. NRC before April 1, 1996, the general license is subject to the additional restrictions below in paragraph ~~(7)~~ (8) of this rule.

~~(7)~~(8) Previously approved package.

- (a) A Type B package previously approved by U.S. NRC but not designated as B(U) or B(M) in the identification number of the U.S. NRC Certificate of Compliance, may be used under the general license above in paragraph ~~(5)~~ (7) of this rule with the following additional conditions:
  1. Fabrication of the packaging was satisfactorily completed by August 31, 1986, as demonstrated by application of its model number in accordance with ~~Sec.~~ 10 CFR 71.85(c);
  2. A package used for a shipment to a location outside the United States is subject to multilateral approval, as defined in U.S. DOT regulations at 49 CFR 173.403; and

3. A serial number that uniquely identifies each packaging that conforms to the approved design is assigned to, and legibly and durably marked on, the outside of each packaging.
- (b) A Type B(U) package, a Type B(M) package, a low specific activity (LSA) material package or a fissile material package, previously approved by the U.S. NRC but without the designation '-85' in the identification number of the U.S. NRC Certificate of Compliance, may be used under the general license above in paragraph (5) (7) of this rule with the following additional conditions:
1. Fabrication of the package was satisfactorily completed by April 1, 1999 as demonstrated by application of its model number in accordance with 10 CFR 71.85(c);
  2. A package used for a shipment to a location outside the United States is subject to multilateral approval as defined in U.S. DOT regulations at 49 CFR 173.403; and
  3. A serial number that uniquely identifies each packaging that conforms to the approved design is assigned to and legibly and durably marked on the outside of each packaging.
- (8) ~~General license: U.S. DOT specification container.~~
- ~~(a) A general license is issued to any licensee of the Division to transport, or to deliver to a carrier for transport, licensed material in a specification container for fissile material or for a Type B quantity of radioactive material as specified in U.S. DOT regulations at 49 CFR Parts 173 and 178.~~
- ~~(b) This general license applies only to a licensee who:~~
- ~~1. Has a copy of the specification;~~
  - ~~2. Complies with the terms and conditions of the specification and the applicable requirements of this rule; and~~
  - ~~3. Has submitted to the Division and received Division approval for a quality assurance program that satisfies the provisions found in Subpart H of 10 CFR 71.~~
- ~~(c) This general license is subject to the limitation that the specification container may not be used for a shipment to a location outside the United States, except by multilateral approval, as defined in U.S. DOT regulations at 49 CFR 173.403.~~
- (9) General license: Use of foreign approved package.
- (a) A general license is issued to any licensee of the Division to transport, or to deliver to a carrier for transport, licensed material in a package the design of which has been approved in a foreign national competent authority certificate that has been revalidated by U.S. DOT as meeting the applicable requirements of 49 CFR 171.12.
- (b) This general license applies only to a licensee who:
1. Has a copy of the applicable certificate, the revalidation and the drawings and other documents referenced in the certificate, relating to the use and maintenance of the packaging and to the actions to be taken before shipment;
  2. Complies with the terms and conditions of the certificate and revalidation and with the applicable requirements of this rule. With respect to the quality assurance provisions of 10 CFR Part 71, the licensee is exempt from design, construction, and fabrication considerations; and
  3. Has submitted to the Division and received Division approval for a quality assurance program that satisfies the provisions found in Subpart H of 10 CFR 71.

- (c) This general license applies only to shipments made to or from locations outside the United States.

(10) .. General license: Fissile material

- (a) A general license is issued to any licensee of the Division or U.S. NRC to transport fissile material, or to deliver fissile material to a carrier for transport, if the material is shipped in accordance with this paragraph. The fissile material need not be contained in a package which meets the standards of 10 CFR Part 71 subparts E and F of U.S. NRC regulations; however, the material must be contained in a Type A package. The Type A package must also meet the DOT requirements of 49 CFR 173.417(a).
- (b) The general license applies only to a licensee who has submitted to the Division and received Division approval for a quality assurance program that satisfies the provisions found in Subpart H of 10 CFR 71.
- (c) The general license applies only when a package's contents:
  - 1. Contain less than a Type A quantity of fissile material; and
  - 2. Contain less than 500 total grams of beryllium, graphite, or hydrogenous material enriched in deuterium.
- (d) The general license applies only to packages containing fissile material that are labeled with a CSI which:
  - 1. Has been determined in accordance with subparagraph (e) of this rule;
  - 2. Has a value less than or equal to 10; and
  - 3. For a shipment of multiple packages containing fissile material, the sum of the CSIs must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).
- (e) 1. The value for the CSI must be greater than or equal to the number calculated by the following equation:

$$CSI = 10 \left[ \frac{\text{grams of } ^{235}\text{U}}{X} + \frac{\text{grams of } ^{233}\text{U}}{Y} + \frac{\text{grams of Pu}}{Z} \right];$$

- 2. The calculated CSI must be rounded up to the first decimal place;
- 3. The values of X, Y, and Z used in the CSI equation must be taken from Tables RHS 7-3 or 7-4, as appropriate;
- 4. If Table RHS 7-4 is used to obtain the value of X, then the values for the terms in the equation for uranium-233 and plutonium must be assumed to be zero; and
- 5. Table RHS 7-3 values for X, Y, and Z must be used to determine the CSI if:
  - (i) Uranium-233 is present in the package;
  - (ii) The mass of plutonium exceeds 1 percent of the mass of uranium-235;
  - (iii) The uranium is of unknown uranium-235 enrichment or greater than 24 weight percent enrichment; or

- (iv) Substances having a moderating effectiveness (i.e., an average hydrogen density greater than H<sub>2</sub>O) (e.g., certain hydrocarbon oils or plastics) are present in any form, except as polyethylene used for packing or wrapping.

Table RHS 7-3. Mass Limits for General License Packages Containing Mixed Quantities of Fissile Material or Uranium-235 of Unknown Enrichment per subparagraph (10)(e) of Rule 1200-02-10-.30

Fissile material	Fissile material mass mixed with moderating substances having an average hydrogen density less than or equal to H <sub>2</sub> O (grams)	Fissile material mass mixed with moderating substances having an average hydrogen density greater than H <sub>2</sub> O <sup>a</sup> (grams)
<sup>235</sup> U (X)	60	38
<sup>233</sup> U (Y)	43	27
<sup>239</sup> Pu or <sup>241</sup> Pu (Z)	37	24

<sup>a</sup> When mixtures of moderating substances are present, the lower mass limits shall be used if more than 15 percent of the moderating substance has an average hydrogen density greater than H<sub>2</sub>O.

Table RHS 7-4 Mass Limits for General License Packages Containing Uranium-235 of Known Enrichment per subparagraph (10)(e) of Rule 1200-02-10-.30

Uranium enrichment in weight percent of <sup>235</sup> U not exceeding	Fissile material mass of <sup>235</sup> U (X) (grams)
24	60
20	63
15	67
11	72
10	76
9.5	78
9	81
8.5	82
8	85
7.5	88
7	90
6.5	93
6	97
5.5	102
5	108
4.5	114
4	120
3.5	132
3	150
2.5	180
2	246
1.5	408

1.35	480
1	1,020
0.92	1,800

(11) General license: Plutonium-beryllium special form material.

- (a) A general license is issued to any licensee of the Division or the U.S. NRC to transport fissile material in the form of plutonium-beryllium (Pu-Be) special form sealed sources, or to deliver Pu-Be sealed sources to a carrier for transport, if the material is shipped in accordance with this rule. This material need not be contained in a package which meets the standards of 10 CFR Part 71 subparts E and F; however, the material must be contained in a Type A package. The Type A package must also meet the DOT requirements of 49 CFR 173.417(a).
- (b) The general license applies only to a licensee who has submitted to the Division and received Division approval for a quality assurance program that satisfies the provisions found in Subpart H of 10 CFR 71.
- (c) The general license applies only when a package's contents:
1. Contain no more than a Type A quantity of radioactive material; and
  2. Contain less than 1000 g of plutonium, provided that: plutonium-239, plutonium-241, or any combination of these radionuclides, constitutes less than 240 g of the total quantity of plutonium in the package.
- (d) The general license applies only to packages labeled with a CSI which:
1. Has been determined in accordance with subparagraph (e) of this rule;
  2. Has a value less than or equal to 100; and
  3. For a shipment of multiple packages containing Pu-Be sealed sources, the sum of the CSIs must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).
- (e) 1. The value for the CSI must be greater than or equal to the number calculated by the following equation:

$$CSI = 10 \left[ \frac{\text{Grams of } ^{239}\text{Pu} + \text{grams of } ^{241}\text{Pu}}{24} \right]; \text{ and}$$

2. The calculated CSI must be rounded up to the first decimal place.

(12) Fissile Material: Assumptions as to Unknown Properties of Fissile Material.

- (a) When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties have credible values that will cause the maximum neutron multiplication.

(40)(13) Preliminary determinations.

- (a) Before the first use of any packaging for the shipment of licensed material:

1. The licensee shall ascertain that there are no cracks, pinholes, uncontrolled voids, or other defects that could significantly reduce the effectiveness of the packaging or impact compliance with the standards specified in 10 CFR 71.
2. Where the maximum normal operating pressure will exceed 35 kPa (5 lbf/in<sup>2</sup>) gauge, the licensee shall test the containment system at an internal pressure at least 50 percent (50%) higher than the maximum normal operating pressure, to verify the capability of that system to maintain its structural integrity at that pressure; and
3. The licensee shall conspicuously and durably mark the packaging with its model number, serial number, gross weight and a package identification number assigned by the U.S. Nuclear Regulatory Commission (U.S. NRC). Before applying the model number, the licensee shall determine that the packaging has been fabricated in accordance with the design approved by the U.S. NRC.

(b) Reserved.

(14) Routine determinations.

(a) Before each shipment of licensed material, the licensee shall ensure that the package with its contents satisfies the applicable requirements of this rule and of the license. The licensee shall determine that:

1. The package is proper for the contents to be shipped in accordance with 49 CFR 173.401 through 435;
2. The package is in unimpaired physical condition except for superficial defects such as marks or dents;
3. Each closure device of the packaging, including any required gasket, is properly installed, secured and free of defects;
4. Any system for containing liquid is adequately sealed and has adequate space or other specified provision for expansion of the liquid in accordance with 10 CFR 71, Subpart F;
5. Any pressure relief device is operable and set in accordance with written procedures;
6. The package has been loaded and closed in accordance with written procedures;
7. For fissile material, any moderator or neutron absorber, if required, is present and in proper condition;
8. Any structural part of the package that could be used to lift or tie down the package during transport is rendered inoperable for that purpose, unless it satisfies the design requirements of 10 CFR 71.45;
9. The level of non-fixed (removable) radioactive contamination on the external surfaces of each package offered for shipment is as low as reasonably achievable and within the limits specified in U.S. DOT regulations in 49 CFR 173.443;
10. External radiation levels around the package and around the vehicle, if applicable, will not exceed the limits specified in 10 CFR 71.47 at any time during transportation; and
11. Accessible package surface temperatures will not exceed the limits specified in 10 CFR 71.43(g) at any time during transportation.

(b) Reserved.

(15) Air transport of plutonium.

SS-7039 (July 2010)

- (a) Notwithstanding the provisions of any general licenses and notwithstanding any exemptions stated directly in this rule or included indirectly by citation of 49 CFR Chapter I, as may be applicable, the licensee shall assure that plutonium in any form, whether for import, export or domestic shipment, is not transported by air or delivered to a carrier for air transport unless:
1. The plutonium is contained in a medical device designed for individual human application; or
  2. The plutonium is contained in a material in which the specific activity is ~~not greater than 0.002  $\mu$ Ci/g (70 Bq/g) of material~~ less than or equal to the activity concentration values for plutonium specified in Schedule 10-6: Determination of  $A_1$  and  $A_2$  in the Appendix to Chapter 1200-02-10 and in which the radioactivity is essentially uniformly distributed; or
  3. The plutonium is shipped in a single package containing no more than an  $A_2$  quantity of plutonium in any isotope or form and is shipped in accordance with paragraphs (4) and (5) of Rule 1200-02-10-30~~(3) and (4)~~; or
  4. The plutonium is shipped in a package specifically authorized for the shipment of plutonium by air in the Certificate of Compliance for that package issued by the U.S. Nuclear Regulatory Commission.
- (b) Nothing in subparagraph (a) of this paragraph is to be interpreted as removing or diminishing the requirements of 10 CFR 73.24.
- (c) For a shipment of plutonium by air that is subject to part (a)4 above of this paragraph, the licensee shall, through special arrangement with the carrier, require compliance with 49 CFR 175.704, U.S. Department of Transportation regulations applicable to the air transport of plutonium.

~~(13)~~(16)Opening instructions. Before delivery of a package to a carrier for transport, the licensee shall ensure that any special instructions needed to safely open the package have been sent to, or otherwise made available to, the consignee for the consignee's use in accordance with subparagraphs (5)(a) and (b) of Rule 1200-02-05-115~~(5)(a) and (b)~~.

~~(14)~~(17)Records.

- (a) Each licensee shall maintain, for a period of three (3) years after shipment, a record of each shipment of licensed material not exempt under paragraph (6) of Rule 1200-02-10-30~~(9)~~, showing where applicable:
1. Identification of the packaging by model number and serial number;
  2. Verification that there are no significant defects in the packaging, as shipped;
  3. Volume and identification of coolant;
  4. Type and quantity of licensed material in each package and the total quantity of each shipment;
  5. For each item of irradiated fissile material:
    - (i) Identification by model number and serial number;
    - (ii) Irradiation and decay history to the extent appropriate to demonstrate that its nuclear and thermal characteristics comply with license conditions; and
    - (iii) Any abnormal or unusual condition relevant to radiation safety;

6. Date of the shipment;
7. For fissile packages and for Type B packages, any special controls exercised;
8. Name and address of the transferee;
9. Address to which the shipment was made; and
10. Results of the determinations required by paragraph (14) of Rule 1200-02-10-.30(44) and by the conditions of the package approval.

(b) The licensee shall make available to the Division for inspection, upon reasonable notice, all records required by this rule. Records are only valid if stamped, initialed, or signed and dated by authorized personnel or otherwise authenticated.

(15)(18) The licensee shall maintain sufficient written records to furnish evidence of the quality of packaging. The records to be maintained include results of the determinations required by paragraph (13) of Rule 1200-02-10-.30(44); design, fabrication and assembly records; results of reviews, inspections, tests and audits; results of monitoring work performance and materials analyses; and results of maintenance, modification and repair activities. Inspection, test and audit records shall identify the inspector or data recorder, the type of observation, the results, the acceptability and the action taken in connection with any deficiencies noted. The records shall be retained for three (3) years after the life of the packaging to which they apply.

(16)(19) Inspection and tests. In addition to the requirements in paragraph (1) of Rule 1200-02-10-.27(4) and Rule 1200-02-10-.28, the licensee shall notify the Director, Division of Radiological Health, at the address given in Rule 1200-02-04-.07, at least 45 days before fabrication of a package to be used for the shipment of licensed material having a decay heat load in excess of 5 kW or with a maximum normal operating pressure in excess of 103 kPa (15 lbf/in<sup>2</sup>) gauge.

(17)(20) Reports. The licensee shall report to the Director, Division of Radiological Health, within 30 days:

- (a) Any instance in which there is significant reduction in the effectiveness of any approved Type B, or fissile, packaging during use;
- (b) Details of any defects with safety significance in Type B, or fissile, packaging after first use, with the means employed to repair the defects and prevent their recurrence; or
- (c) Instances in which the conditions of approval in the certificate of compliance were not observed in making a shipment.

(18)(21) Advance notification of shipment of irradiated reactor fuel and nuclear waste.

- (a) As specified in subparagraphs (b), (c) and (d) below of this paragraph, each licensee shall provide advance notification to the governor of Tennessee of a state, or the governor's designee, and to the Director, Division of Radiological Health, of the shipment of licensed material through or across the boundary of the State, before the transport, or delivery to a carrier for transport, of licensed material outside the confines of the licensee's plant or other place of use or storage.
- (b) Advance notification is required under this section for shipments of irradiated reactor fuel in quantities less than that subject to advance notification requirements of 10 CFR 73.37(f). Advance notification is also required under this section for shipment of licensed material, other than irradiated fuel, meeting the following three conditions:
  1. The licensed material is required by 10 CFR 71 to be in Type B packaging for transportation;
  2. The licensed material is being transported to or across the State boundary en route to a disposal facility or to a collection point for transport to a disposal facility; and

3. The quantity of licensed material in a single package exceeds the least of the following:
    - (i) 3000 times the  $A_1$  value of the radionuclides as specified in ~~appendix A~~ Schedule 10-6, Table A-1 for special form radioactive material;
    - (ii) 3000 times the  $A_2$  value of the radionuclides as specified in ~~appendix A~~ Schedule 10-6, Table A-1 for normal form radioactive material; or
    - (iii) 1000 TBq (27,000 Ci).
- (c) Procedures for submitting advance notification.
1. The notification shall be made in writing to the office of each appropriate governor or governor's designee and to the Director, Division of Radiological Health.
  2. A notification delivered by mail shall be postmarked at least seven (7) days before the beginning of the seven (7) day period during which departure of the shipment is estimated to occur.
  3. A notification delivered by messenger any other means than mail shall reach the office of the governor, or of the governor's designee, and of the Director, Division of Radiological Health, at least four (4) days before the beginning of the seven (7) day period during which departure of the shipment is estimated to occur.
    - (i) A list of the names and mailing addresses of the governors' designees receiving advance notification of transportation of nuclear waste was published in the Federal Register on June 30, 1995 (60 FR 34306).
    - (ii) The list will be published annually in the Federal Register on or about June 30 to reflect any changes in information.
    - (iii) A list of the names and mailing addresses of the governors' designees is available on request from the Director, Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.
    - (iv) The licensee shall retain a copy of the notification as a record for three (3) years.
- (d) Information to be furnished in advance notification of shipment. Each advance notification of shipment of irradiated reactor fuel or nuclear waste shall contain the following information:
1. The name, address and telephone number of the shipper, carrier and receiver of the irradiated reactor fuel or nuclear waste shipment;
  2. A description of the irradiated reactor fuel or nuclear waste contained in the shipment, as specified in the regulations of U.S. DOT in 49 CFR 172.202 and 172.203(d);
  3. The point of origin of the shipment and the seven (7) day period during which departure of the shipment is estimated to occur;
  4. The seven (7) day period during which arrival of the shipment at the State's boundaries is estimated to occur;
  5. The destination of the shipment and the seven (7) day period during which arrival of the shipment is estimated to occur; and
  6. A point of contact, with a telephone number, for current shipment information.
- (e) Revision notice. A licensee who finds that schedule information previously furnished to the governor, or governor's designee, and to the Director, Division of Radiological Health, in

accordance with this section, will not be met, shall telephone a responsible individual in the office of the governor of the State, or of the governor's designee, and of the Division of Radiological Health and inform those individuals of the extent of the delay beyond the schedule originally reported. The licensee shall maintain a record of the name of the individual contacted for three (3) years.

(f) Cancellation notice.

1. Each licensee who cancels an irradiated reactor fuel or nuclear waste shipment for which advance notification has been sent shall send a cancellation notice to the governor of each State, or to the governor's designee, previously notified, and to the Director, Division of Radiological Health.
2. The licensee shall state in the notice that it is a cancellation and identify the advance notification that is being canceled. The licensee shall retain a copy of the notice as a record for three (3) years.

(22) Quality Assurance

(a) Quality Assurance Requirements.

1. This subparagraph describes quality assurance requirements applying to design, purchase, fabrication, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, repair, and modification of components of packaging that are important to safety. As used in this paragraph, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to control of the physical characteristics and quality of the material or component to predetermined requirements. The licensee, certificate holder, and applicant for a CoC are responsible for the quality assurance requirements as they apply to design, fabrication, testing, and modification of packaging. Each licensee is responsible for the quality assurance provision which applies to its use of a packaging for the shipment of licensed material subject to this paragraph.
2. Establishment of program. Each licensee, certificate holder, and applicant for a CoC shall establish, maintain, and execute a quality assurance program satisfying each of the applicable criteria of 10 CFR 71.101 through 71.137 and satisfying any specific provisions that are applicable to the licensee's activities including procurement of packaging. The licensee, certificate holder, and applicant for a CoC shall execute the applicable criteria in a graded approach to an extent that is commensurate with the quality assurance requirement's importance to safety.
3. Approval of program. Before the use of any package for the shipment of licensed material subject to this paragraph, each licensee shall obtain Division approval of its quality assurance program and file a description of its quality assurance program, including a discussion of which requirements of this paragraph are applicable and how they will be satisfied.
4. Radiography containers. A program for transport container inspection and maintenance limited to radiographic exposure devices, source changers, or packages transporting these devices and meeting the requirements of subparagraph (8)(b) of Rule 1200-02-08-.04 or equivalent Nuclear Regulatory Commission, or Agreement State requirement, is deemed to satisfy the requirements of parts (7)(b)4 and (22)(a)2 of Rule 1200-02-10-.30.

(b) Quality assurance organization.

1. A licensee<sup>1</sup>, certificate holder, and applicant for a CoC shall be responsible for the establishment and execution of the quality assurance program. The licensee, certificate holder, and applicant for a CoC may delegate to others, such as contractors, agents, or consultants, the work of establishing and executing the quality assurance program, or any part of the quality assurance program, but shall retain responsibility for the program. These activities include performing the functions associated with attaining quality objectives and the quality assurance functions.
  2. The quality assurance functions are—
    - (i) Assuring that an appropriate quality assurance program is established and effectively executed; and
    - (ii) Verifying, by procedures such as checking, auditing, and inspection, that activities affecting the functions that are important to safety have been correctly performed.
  3. The persons and organizations performing quality assurance functions must have sufficient authority and organizational freedom to—
    - (i) Identify quality problems;
    - (ii) Initiate, recommend, or provide solutions; and
    - (iii) Verify implementation of solutions.
- (c) Quality assurance program.

1. A licensee, certificate holder, and applicant for a CoC shall establish, at the earliest practicable time consistent with the schedule for accomplishing the activities, a quality assurance program that complies with the requirements of 10 CFR 71.101 through 71.137. The licensee, certificate holder, and applicant for a CoC shall document the quality assurance program by written procedures or instructions and shall carry out the program in accordance with those procedures throughout the period during which the packaging is used. The licensee, certificate holder, and applicant for a CoC shall identify the material and components to be covered by the quality assurance program, the major organizations participating in the program, and the designated functions of these organizations.
2. A licensee, certificate holder, and applicant for a CoC, through its quality assurance program, shall provide control over activities affecting the quality of the identified materials and components to an extent consistent with their importance to safety, and as necessary to assure conformance to the approved design of each individual package used for the shipment of radioactive material. The licensee, certificate holder, and applicant for a CoC shall assure that activities affecting quality are accomplished under suitably controlled conditions. Controlled conditions include the use of appropriate equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanliness; and assurance that all prerequisites for the given activity have been satisfied. The licensee, certificate holder, and applicant for a CoC shall take into account the need for special controls, processes, test equipment, tools, and skills to attain the required quality, and the need for verification of quality by inspection and test.

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<sup>1</sup> While the term "licensee" is used in these criteria, the requirements are applicable to whatever design, fabrication, assembly, and testing of the package is accomplished with respect to a package before the time a package approval is issued.

3. A licensee, certificate holder, and applicant for a CoC shall base the requirements and procedures of its quality assurance program on the following considerations concerning the complexity and proposed use of the package and its components:

- (i) The impact of malfunction or failure of the item to safety;
- (ii) The design and fabrication complexity or uniqueness of the item;
- (iii) The need for special controls and surveillance over processes and equipment;
- (iv) The degree to which functional compliance can be demonstrated by inspection or test; and
- (v) The quality history and degree of standardization of the item.

4. A licensee, certificate holder, and applicant for a CoC shall provide for indoctrination and training of personnel performing activities affecting quality, as necessary to assure that suitable proficiency is achieved and maintained. The licensee, certificate holder, and applicant for a CoC shall review the status and adequacy of the quality assurance program at established intervals. Management of other organizations participating in the quality assurance program shall review regularly the status and adequacy of that part of the quality assurance program they are executing.

(d) Handling, storage, and shipping control.

The licensee, certificate holder, and applicant for a CoC shall establish measures to control, in accordance with instructions, the handling, storage, shipping, cleaning, and preservation of materials and equipment to be used in packaging to prevent damage or deterioration. When necessary for particular products, special protective environments, such as inert gas atmosphere, and specific moisture content and temperature levels must be specified and provided.

(e) Inspection, test, and operating status.

- 1. A licensee, a certificate holder, and an applicant for a CoC shall establish measures to indicate, by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items of the packaging. These measures must provide for the identification of items that have satisfactorily passed required inspections and tests, where necessary to preclude inadvertent bypassing of the inspections and tests.
- 2. A licensee shall establish measures to identify the operating status of components of the packaging, such as tagging valves and switches, to prevent inadvertent operation.

(f) Nonconforming materials, parts, or components.

A licensee, certificate holder, and applicant for a CoC shall establish measures to control materials, parts, or components that do not conform to the licensee's requirements to prevent their inadvertent use or installation. These measures must include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items must be reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures.

(g) Corrective action.

A licensee, certificate holder, and applicant for a CoC shall establish measures to assure that conditions adverse to quality, such as deficiencies, deviations, defective material and equipment, and nonconformances, are promptly identified and corrected. In the case of a significant condition adverse to quality, the measures must assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition

adverse to quality, the cause of the condition, and the corrective action taken must be documented and reported to appropriate levels of management.

(h) Quality assurance records.

A licensee, certificate holder, and applicant for a CoC shall maintain sufficient written records to describe the activities affecting quality. The records must include the instructions, procedures, and drawings required by 10 CFR 71.111 to prescribe quality assurance activities and must include closely related specifications such as required qualifications of personnel, procedures, and equipment. The records must include the instructions or procedures which establish a records retention program that is consistent with applicable regulations and designates factors such as duration, location, and assigned responsibility. The licensee, certificate holder, and applicant for a CoC shall retain these records for 3 years beyond the date when the licensee, certificate holder, and applicant for a CoC last engage in the activity for which the quality assurance program was developed. If any portion of the written procedures or instructions is superseded, the licensee, certificate holder, and applicant for a CoC shall retain the superseded material for 3 years after it is superseded.

(i) Audits.

A licensee, a certificate holder, and an applicant for a CoC shall carry out a comprehensive system of planned and periodic audits to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The audits must be performed in accordance with written procedures or checklists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audited results must be documented and reviewed by management having responsibility in the area audited. Follow up action, including reaudit of deficient areas, must be taken where indicated.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Commissioner on 09/07/2010, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/08/2010

Rulemaking Hearing(s) Conducted on: (add more dates). 08/09/2010

Date: 09/07/2010

Signature: \_\_\_\_\_

Name of Officer: James H. Fyke

Title of Officer: Commissioner

Subscribed and sworn to before me on: \_\_\_\_\_

Notary Public Signature: \_\_\_\_\_

My commission expires on: \_\_\_\_\_

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Commissioner on 09/07/2010, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/08/2010

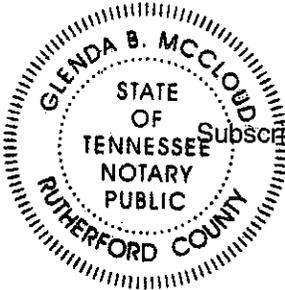
Rulemaking Hearing(s) Conducted on: (add more dates). 08/09/2010

Date: 09/07/2010

Signature: *James H. Fyke*

Name of Officer: James H. Fyke

Title of Officer: Commissioner



Subscribed and sworn to before me on: 9-8-10

Notary Public Signature: *Glenda B. McCloud*

My commission expires on: 1-24-12

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

*Robert E. Cooper, Jr.*  
Robert E. Cooper, Jr.  
Attorney General and Reporter  
9-1-11

Date

**Department of State Use Only**

Filed with the Department of State on: 9/7/11

Effective on: 12/6/11

*Tre Hargett*  
Tre Hargett  
Secretary of State

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**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: Environment and Conservation

DIVISION: Radiological Health

SUBJECT: Regulation of Radioactive Material and Byproduct Material

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-201 et seq.

EFFECTIVE DATES: December 8, 2011 through June 30, 2012

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

Chapters 1200-02-04, 1200-02-05, 1200-02-07, 1200-02-10 and 1200-02-11 are being amended so that they will substantially codify 10 CFR Parts 19, 20, 30, 31, 32, 33, 35, 61, and 150 of the Nuclear Regulatory Commission's ("NRC") Regulations. These amendments are consistent with the NRC's approved suggested state regulations. Its various additions and modifications will incorporate:

- a. Security requirements for portable gauges;
- b. Changes in reporting requirements for licensees distributing radioactive material to persons exempt from licensing and the modification of transferring general licenses;
- c. Expanding the definition of byproduct material to include discrete sources of radium-226, accelerator-produced radioactive material, and discrete sources of naturally occurring radioactive material as required by the Energy Policy Act of 2005;
- d. Provide a regulatory framework for licensing and regulating aforementioned byproduct material;
- e. Revising rules related to occupational dose records; and
- f. Authorized user clarification for medical use of radioactive material.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

Comment: Does the amended Rule 1200-02-05-.50(3) preserve the calculations as approved by the state concerning specials, heart cath, etc.?

Response: Yes, the amended rule will allow licensees or registrants to substitute "effective dose equivalent (EDE)" for "deep-dose equivalent (DDE)" for external exposures.

Comment: Rule 1200-02-05-.142(2)(a) should be eliminated or changed to 500 mrem/5 rem.

Response: The Department must adopt Rule 1200-02-05-.142 to stay compatible with the NRC.

Comment: You have defined "cyclotron" as a device that operates over 10 MeV. Most commercial cyclotrons operated for PET radiopharmaceutical production are able to operate at higher-than-needed 11 MeV for historical reasons. Some new lower energy (7.5 MeV) ones being developed are adequate energy, but physically much smaller, and aimed at medical institutions who desire to produce their own for onsite use. You may want to reconsider the energy limit in your definition.

Response: The Department agrees. The definition of cyclotron will be changed to "a particle accelerator in which the charged particles travel in an outward spiral or circular path. A cyclotron accelerates charged particles and is commonly used for production of short half-life radionuclides for medical or veterinary use."

Comment: The definition of accelerator in Rule 1200-02-09-.03 differs from the new definition of particle accelerator in Rule 1200-02-04-.04.

Response: The definition of particle accelerator in Rule 1200-02-04-.04 will be amended to be identical to the definition of accelerator in Rule 1200-02-09-.03.

Comments: The citations at the end of Part 2 and Part 3 of Rule 1200-02-07-.48(1)(c) should be separated by "or" instead of "and".

Response: The Department agrees.

Comments: In subparagraph (16)(a) of Rule 1200-02-10-.13, the "and" between "calibration" and "reference" should be changed to "or".

Response: The Department agrees.

**Regulatory Flexibility Addendum**

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

Chapters 1200-02-04, 1200-02-05, 1200-02-07, 1200-02-10, and 1200-02-11 are being amended so they will substantially codify 10 CFR Parts 19, 20, 30, 31, 32, 33, 35, 61, and 150 of the regulations of the Nuclear Regulatory Commission ("NRC"). These amendments are consistent with the NRC approved state suggested regulations.

### **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Department does not anticipate that these amended rules will have a financial impact on local governments.

Department of State  
 Division of Publications  
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For Department of State Use Only

Sequence Number: 09-06-11  
 Rule ID(s): 5012-5016  
 File Date: 09/09/2011  
 Effective Date: 12/08/2011

# Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205

<b>Agency/Board/Commission:</b>	Environment and Conservation
<b>Division:</b>	Radiological Health
<b>Contact Person:</b>	Beth Murphy
<b>Address:</b>	3 <sup>rd</sup> Floor L&C Annex 401 Church Street Nashville, Tennessee
<b>Zip:</b>	37243-1532
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<b>Email:</b>	<a href="mailto:beth.murphy@tn.gov">beth.murphy@tn.gov</a>

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1200-02-04	General Provisions
Rule Number	Rule Title
1200-02-04-.04	Definitions

Chapter Number	Chapter Title
1200-02-05	Standards for Protection Against Radiation
Rule Number	Rule Title
1200-02-05-.32	Definitions
1200-02-05-.50	Occupational Dose Limits for Adults
1200-02-05-.120	General Disposal Requirements
1200-02-05-.125	Transfer for Disposal and Manifests
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1200-02-07-.38	Use of Unsealed Radioactive Material for Uptake, Dilution, and Excretion Studies for Which a Written Directive is Not Required
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1200-02-07-.47	Training for Use of Unsealed Radioactive Material for Which a Written Directive is Required
1200-02-07-.48	Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less Than or Equal to 1.22 Gigabecquerels (33 Millicuries)
1200-02-07-.49	Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less greater than 1.22 Gigabecquerels (33 Millicuries)
1200-02-07-.50	Training for the Parenteral Administration of Unsealed Radioactive Material Requiring a Written Directive
1200-02-07-.59	Training for Use of Manual Brachytherapy Sources
1200-02-07-.60	Training for Ophthalmic Use of Strontium-90
1200-02-07-.80	Training for Use of Remote Afterloader Units, Teletherapy Units, and Gamma Stereotactic Radiosurgery Units

Chapter Number	Chapter Title
1200-02-10	Licensing and Registration
Rule Number	Rule Title
1200-02-10-.02	Scope
1200-02-10-.04	Exemptions: Radioactive Materials Other Than Source Material
1200-02-10-.10	General Licenses - Radioactive Material Other Than Source Material
1200-02-10-.11	Filing of Application for Specific Licenses
1200-02-10-.13	Special Requirements for Issuance of Specific Licenses
1200-02-10-.16	Specific Terms and Conditions of Licenses
1200-02-10-.29	Reciprocal Recognition of Licenses

Chapter Number	Chapter Title
1200-02-11	Licensing Requirements for Land Disposal of Radioactive Waste
Rule Number	Rule Title
1200-02-11-.14	Transfer of License

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

Chapter 1200-02-04  
General Provisions

Amendments

Subparagraph (b) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (b) shall read as follows:

- (b) 'Accelerator-produced radioactive material' means any material made radioactive by ~~an~~ a particle accelerator.

Subparagraph (ooo) of Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (ooo) shall read as follows:

- (ooo) 'Waste' means those low-level radioactive wastes containing ~~radioactive materials source, special nuclear, or byproduct material that are acceptable for disposal at a land disposal facility. For the purposes of this definition, low-level waste is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste)~~ subparagraphs (11)(b), (11)(c), and (11)(d) of Rule 1200-02-05-.32.

Paragraph (1) of Rule 1200-02-04-.04 Definitions is amended by adding new subparagraphs (hhhh) through (jjjj) so that subparagraphs (hhhh) through (jjjj) shall read as follows:

- (hhhh) 'Consortium' means an association of medical use licensees and a PET radionuclide production facility in the same geographical area that jointly own or share in the operation and maintenance cost of the PET radionuclide production facility that produces PET radionuclides for use in producing radioactive drugs within the consortium for noncommercial distributions among its associated members for medical use. The PET radionuclide production facility within the consortium must be located at an educational institution or a Federal facility or a medical facility.
- (iiii) 'Cyclotron' means a particle accelerator in which the charged particles travel in an outward spiral or circular path. A cyclotron accelerates charged particles and is commonly used for production of short half-life radionuclides for medical or veterinary use.
- (jjjj) 'Discrete source' means a radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical, or research activities.
- (kkkk) 'Particle accelerator' means any device used to impact kinetic energy to electrically charged particles including but not limited to electrons, protons, deuterons, and helium ions. For the purpose of these regulations "accelerator" includes equipment designed for and used only for the production of x-rays of 0.9 MeV or greater and equipment capable of discharging nuclear particles into a medium external to the accelerating device. For purposes of this definition, "accelerator" is an equivalent term.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Chapter 1200-02-05  
Standards for Protection Against Radiation

Amendments

Paragraph (11) of Rule 1200-02-05-.32 Definitions is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (11) shall read as follows:

- (11) Byproduct material ~~refers to~~ means:
- (a) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;
  - (b) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition;
  - (c) 1. Any discrete source of radium-226 that is produced, extracted, or converted after extraction for use for a commercial, medical, or research activity; or

2. Any material that—
  - (i) Has been made radioactive by use of a particle accelerator; and
  - (ii) Is produced, extracted, or converted after extraction for use for a commercial, medical, or research activity; and
- (d) Any discrete source of naturally occurring radioactive material, other than source material, that—
  1. The Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and
  2. Is extracted or converted after extraction for use in a commercial, medical, or research activity.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (3) of Rule 1200-02-05-.50 Occupational Dose Limits for Adults is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (3) shall read as follows:

- (3) When external exposure is determined by measurement with an external personal monitoring device, the deep-dose equivalent must be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a dosimetry method approved by the Division or by the Nuclear Regulatory Commission. The assigned deep-dose equivalent shall be for the part of the body receiving the highest exposure. The assigned shallow-dose equivalent shall be the dose averaged over the contiguous 10 cm <sup>2</sup> of skin receiving the highest exposure. Deep-dose, lens-dose and shallow-dose equivalents may be assessed from surveys or other radiation measurements to demonstrate compliance with occupational dose limits. However, this may be done only if the individual monitoring device was not subject to the highest potential exposure, or the individual monitoring results are unavailable.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subparagraph (d) of paragraph (1) of Rule 1200-02-05-.120 General Disposal Requirements is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (d) shall read as follows:

- (d) As authorized under Rule 1200-02-05-.121, 1200-02-05-.122, 1200-02-05-.123, or 1200-02-05-.124 or 1200-02-05-.127.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-05-.125 Transfer for Disposal and Manifests is amended by adding paragraph (5) to the rule to read as follows:

- (5) Any licensee shipping byproduct material as defined in subparagraphs (c) and (d) of the definition of Byproduct material set forth in Rule 1200-02-05-.32(11) intended for ultimate disposal at a land disposal facility licensed under Chapter 1200-02-11 shall document the information required on the NRC's Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee as specified in Schedule RHS 8-33.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (2) of Rule 1200-02-05-.142 Reports to Individuals of Exposure to Radiation is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (2) shall read as follows:

- (2) Each licensee or registrant, ~~at the request of any worker, shall advise such worker annually of the worker's exposure to sources of radiation as shown in records maintained by the licensee or registrant~~

pursuant to Rule 1200-02-05-.135, shall make dose information available to workers as shown in records maintained by the licensee or registrant under the provisions of Rule 1200-02-05-.135. The licensee shall provide an annual report to each individual monitored under Rule 1200-02-05-.71 of the dose received in that monitoring year if:

- (a) The individual's occupational dose exceeds 1 mSv (100 mrem) TEDE or 1 mSv (100 mrem) to any individual organ or tissue; or
- (b) The individual requests his or her annual dose report.

Paragraph (4) of Rule 1200-02-05-.142 Reports to Individuals of Exposure to Radiation is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (4) shall read as follows:

- (4) When a licensee or registrant is required under Rule 1200-02-05-.141, 1200-02-05-.143, or 1200-02-05-.144 to report to the Division any exposure of an ~~identified occupationally exposed individual or an identified member of the public to sources of~~ to radiation or radioactive material, the licensee or registrant shall also provide a copy of the report submitted to the Division to the individual. Such report shall be transmitted at a time not later than the transmittal to the Division.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Schedule RHS 8-30 of Rule 1200-02-05-.161 Schedules is amended by deleting the table and substituting the following so that, as amended, Schedule RHS 8-30 shall read as follows:

#### RHS 8-30

### ANNUAL LIMITS ON INTAKE (ALI) AND DERIVED AIR CONCENTRATIONS (DAC) OF RADIONUCLIDES FOR OCCUPATIONAL EXPOSURE; EFFLUENT CONCENTRATIONS; CONCENTRATIONS FOR RELEASE TO SANITARY SEWERAGE

#### Introduction

For each radionuclide, Table I indicates the chemical form which is to be used for selecting the appropriate ALI or DAC value. The ALIs and DACs for inhalation are given for an aerosol with an activity median aerodynamic diameter (AMAD) of 1  $\mu$ m, micron, and for three classes (D,W,Y) of radioactive material, which refer to their retention (approximately days, weeks, or years) in the pulmonary region of the lung. This classification applies to a range of clearance half-times for D if less than 10 days, for W from 10 to 100 days, and for Y greater than 100 days. The class (D, W, or Y) given in the column headed "Class" applies only to the inhalation ALIs and DACs given in Table I, columns 2 and 3. Table II provides concentration limits for airborne and liquid effluents released to the general environment. Table III provides concentration limits for discharges to sanitary sewerage systems.

#### Note:

The values in Tables I, II, and III are presented in the computer "E" notation. In this notation a value of 6E-02 represents a value of  $6 \times 10^{-2}$  or 0.06, 6E+2 represents  $6 \times 10^2$  or 600, and 6E+0 represents  $6 \times 10^0$  or 6.

#### Table I "Occupational Values"

Note that the columns in Table I of this schedule captioned, "Oral Ingestion ALI," "Inhalation," "ALI," and "DAC," are applicable to occupational exposure to radioactive material.

The ALIs in this schedule are the annual intakes of a given radionuclide by the reference man, which would result in either a committed effective dose equivalent (CEDE) of 0.05 Sv (5 rem), stochastic ALI, or a committed dose equivalent of 0.5 Sv (50 rem) to an organ or tissue, non-stochastic ALI. The stochastic ALIs were derived to result in a risk, due to irradiation of organs and tissues, comparable to the risk associated with deep dose equivalent to the whole body of 0.05 Sv (5 rem). The derivation includes multiplying the committed dose equivalent to an organ or tissue by a weighting factor,  $w_T$ . This weighting factor is the proportion of the risk of stochastic effects resulting from irradiation of the organ or tissue, T, to

the total risk of stochastic effects when the whole body is irradiated uniformly. The values of  $w_T$  are listed under the definition of weighting factor in 1200-02-05-.32. The non-stochastic ALIs were derived to avoid non-stochastic effects, such as prompt damage to tissue or reduction in organ function.

A value of  $w_T = 0.06$  is applicable to each of the five organs or tissues in the "remainder" category receiving the highest dose equivalents, and the dose equivalents of all other remaining tissues may be disregarded. The following portions of the GI tract—stomach, small intestine, upper large intestine, and lower large intestine—are to be treated as four separate organs.

Note that the dose equivalents for an extremity, skin, and lens of the eye are not considered in computing the CEDE but are subject to limits that must be met separately.

When an ALI is defined by the stochastic dose limit, this value alone is given. When an ALI is determined by the non-stochastic dose limit to an organ, the organ or tissue to which the limit applies is shown, and the ALI for the stochastic limit is shown in parentheses. Abbreviated organ or tissue designations are used:

1. LLI wall = lower large intestine wall;
2. St wall = stomach wall;
3. Blad wall = bladder wall; and
4. Bone surf = bone surface.

The use of the ALIs listed first, the more limiting of the stochastic and non-stochastic ALIs, will ensure that non-stochastic effects are avoided and that the risk of stochastic effects is limited to an acceptably low value. If, in a particular situation involving a radionuclide for which the non-stochastic ALI is limiting, the use of that non-stochastic ALI is considered unduly conservative, the licensee or registrant may use the stochastic ALI to determine the committed effective dose equivalent. However, the licensee or registrant shall also ensure that the 0.5 Sv (50 rem) dose equivalent limit for any organ or tissue is not exceeded by the sum of the external deep dose equivalent plus the internal committed dose equivalent to that organ, not the effective dose. For the case where there is no external dose contribution, this would be demonstrated if the sum of the fractions of the nonstochastic ALIs ( $ALI_{ns}$ ) that contribute to the committed dose equivalent to the organ receiving the highest dose does not exceed unity, that is,  $\sum (\text{intake [in } \mu\text{Ci] of each radionuclide} / ALI_{ns}) \leq 1.0$ . If there is an external deep dose equivalent contribution of  $H_d$ , then this sum must be less than  $1 - (H_d/50)$ , instead of  $\leq 1.0$ .

Note that the dose equivalents for an extremity, skin, and lens of the eye are not considered in computing the committed effective dose equivalent but are subject to limits that must be met separately.

The derived air concentration (DAC) values are derived limits intended to control chronic occupational

$$\begin{aligned} DAC &= \frac{ALI \text{ (in } \mu\text{Ci)}}{(2000 \text{ hrs / working yr} \times 60 \text{ min/hr} \times 2 \times 10^4 \text{ ml / min})} \\ &= \frac{ALI}{2.4 \times 10^9} \mu\text{Ci/ml} \end{aligned}$$

exposures. The relationship between the DAC and the ALI is given by:

where  $2 \times 10^4$  ml is the volume of air breathed per minute at work by the reference man under working conditions of light work.

The DAC values relate to one of two modes of exposure: either external submersion or the internal committed dose equivalents resulting from inhalation of radioactive materials. DACs based upon submersion are for immersion in a semi-infinite cloud of uniform concentration and apply to each radionuclide separately.

The ALI and DAC values include contributions to exposure by the single radionuclide named and any ingrowth of daughter radionuclides produced in the body by decay of the parent. However, intakes that

include both the parent and daughter radionuclides should be treated by the general method appropriate for mixtures.

The values of ALI and DAC do not apply directly when the individual both ingests and inhales a radionuclide, when the individual is exposed to a mixture of radionuclides by either inhalation or ingestion or both, or when the individual is exposed to both internal and external irradiation. See 1200-02-05-.51. When an individual is exposed to radioactive materials, which fall under several of the translocation classifications of the same radionuclide (such as Class D, Class W, or Class Y), the exposure may be evaluated as if it were a mixture of different radionuclides.

It should be noted that the classification of a compound as Class D, W, or Y is based on the chemical form of the compound and does not take into account the radiological half-life of different radioisotopes. For this reason, values are given for Class D, W, and Y compounds, even for very short-lived radionuclides.

#### Table II "Effluent Concentrations"

The columns in Table II of this schedule captioned "Air" and "Water" are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of 1200-02-05-.61. The concentration values given in Columns 1 and 2 of Table II are equivalent to the radionuclide concentrations, which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.5 mSv (0.05 rem).

Consideration of non-stochastic limits has not been included in deriving the air and water effluent concentration limits because non-stochastic effects are presumed not to occur at or below the dose levels established for individual members of the public. For radionuclides, where the non-stochastic limit was governing in deriving the occupational DAC, the stochastic ALI was used in deriving the corresponding airborne effluent limit in Table II. For this reason, the DAC and airborne effluent limits are not always proportional, as was the case in the previous Schedule RHS 8-1.

The air concentration values listed in Table II, Column 1 were derived by one of two methods. For those radionuclides for which the stochastic limit is governing, the occupational stochastic inhalation ALI was divided by  $2.4 \times 10^9$ , relating the inhalation ALI to the DAC, as explained above, and then divided by a factor of 300. The factor of 300 includes the following components: a factor of 50 to relate the 0.05 Sv (5 rem) annual occupational dose limit to the 1mSv (0.1 rem) limit for members of the public; a factor of three to adjust for the difference in exposure time and the inhalation rate for a worker and that for members of the public; and a factor of two to adjust the occupational values, derived for adults, so that they are applicable to other age groups.

For those radionuclides for which submersion, that is external dose, is limiting, the occupational DAC in Table I, Column 3 was divided by 219. The factor of 219 is composed of a factor of 50, as described above, and a factor of 4.38 relating occupational exposure for 2,000 hours per year to full-time exposure (8,760 hours per year). Note that an additional factor of two for age considerations is not warranted in the submersion case.

The water concentrations were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by  $7.3 \times 10^7$ . The factor of  $7.3 \times 10^7$  (ml) includes the following components: the factors of 50 and 2 described above and a factor of  $7.3 \times 10^5$  (ml), which is the annual water intake of the reference man.

Note 2 of this schedule provides groupings of radionuclides, which are applicable to unknown mixtures of radionuclides. These groupings, including occupational inhalation ALIs and DACs, air and water effluent concentrations and releases to sewer, require demonstrating that the most limiting radionuclides in successive classes are absent. The limit for the unknown mixture is defined when the presence of one of the listed radionuclides cannot be definitely excluded as being present, either from knowledge of the radionuclide composition of the source or from actual measurements.

#### Table III "Releases to Sewers"

The monthly average concentrations for release to sanitary sewerage are applicable to the provisions in 1200-02-05-.122. The concentration values were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by  $7.3 \times 10^6$  (ml). The factor of  $7.3 \times 10^6$  (ml) is composed of a factor of  $7.3 \times 10^5$  (ml), the annual water intake by a reference man, and a factor of 10, such that the concentrations, if the sewage released by the licensee were the only source of water ingested by a reference man during a year, would result in a committed effective dose equivalent of 5 mSv (0.5 rem).

#### LIST OF ELEMENTS

Name	Symbol	Atomic Number	Name	Symbol	Atomic Number
Actinium	Ac	89	Molybdenum	Mo	42
Aluminum	Al	13	Neodymium	Nd	60
Americium	Am	95	Neptunium	Np	93
Antimony	Sb	51	Nickel	Ni	28
Argon	Ar	18	Niobium	Nb	41
Arsenic	As	33	Nitrogen	N	7
Astatine	At	85	Osmium	Os	76
Barium	Ba	56	Oxygen	O	8
Berkelium	Bk	97	Palladium	Pd	46
Beryllium	Be	4	Phosphorus	P	15
Bismuth	Bi	83	Platinum	Pt	78
Bromine	Br	35	Plutonium	Pu	94
Cadmium	Cd	48	Polonium	Po	84
Calcium	Ca	20	Potassium	K	19
Californium	Cf	98	Praseodymium	Pr	59
Carbon	C	6	Promethium	Pm	61
Cerium	Ce	58	Protactinium	Pa	91
Cesium	Cs	55	Radium	Ra	88
Chlorine	Cl	17	Radon	Rn	86
Chromium	Cr	24	Rhenium	Re	75
Cobalt	Co	27	Rhodium	Rh	45
Copper	Cu	29	Rubidium	Rb	37
Curium	Cm	96	Ruthenium	Ru	44
Dysprosium	Dy	66	Samarium	Sm	62
Einsteinium	Es	99	Scandium	Sc	21
Erbium	Er	68	Selenium	Se	34
Europium	Eu	63	Silicon	Si	14
Fermium	Fm	100	Silver	Ag	47
Fluorine	F	9	Sodium	Na	11
Francium	Fr	87	Strontium	Sr	38
Gadolinium	Gd	64	Sulfur	S	16
Gallium	Ga	31	Tantalum	Ta	73
Germanium	Ge	32	Technetium	Tc	43
Gold	Au	79	Tellurium	Te	52
Hafnium	Hf	72	Terbium	Tb	65
Holmium	Ho	67	Thallium	Tl	81
Hydrogen	H	1	Thorium	Th	90
Indium	In	49	Thulium	Tm	69
Iodine	I	53	Tin	Sn	50
Iridium	Ir	77	Titanium	Ti	22
Iron	Fe	26	Tungsten	W	74
Mercury	Hg	80	Uranium	U	92
Krypton	Kr	36	Vanadium	V	23
Lanthanum	La	57	Xenon	Xe	54
Lead	Pb	82	Ytterbium	Yb	70
Lutetium	Lu	71	Yttrium	Y	39
Magnesium	Mg	12	Zinc	Zn	30
Manganese	Mn	25	Zirconium	Zr	40

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
1	Hydrogen-3	Water, DAC includes skin absorption	8E+4	8E+4	2E-5	1E-7	1E-3	1E-2
Gas (HT or T <sub>2</sub> ) Submersion <sup>1</sup> : Use above values as HT and T <sub>2</sub> oxidize in air and in the body to HTO.								
4	Beryllium-7	W, all compounds except those given for Y	4E+4	2E+4	9E-6	3E-8	6E-4	6E-3
		Y, oxides, halides, and nitrates	-	2E+4	8E-6	3E-8	-	-
4	Beryllium-10	W, see Be	1E+3	2E+2	6E-8	2E-10	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see Be	-	1E+1	6E-9	2E-11	-	-
6	Carbon-11 <sup>2</sup>	Monoxide	-	1E+6	5E-4	2E-6	-	-
		Dioxide	-	6E+5	3E-4	9E-7	-	-
		Compounds	4E+5	4E+5	2E-4	6E-7	6E-3	6E-2
6	Carbon-14	Monoxide	-	2E+6	7E-4	2E-6	-	-
		Dioxide	-	2E+5	9E-5	3E-7	-	-
		Compounds	2E+3	2E+3	1E-6	3E-9	3E-5	3E-4
7	Nitrogen-13 <sup>2</sup>	Submersion <sup>1</sup>	-	-	4E-6	2E-8	-	-
8	Oxygen-15 <sup>2</sup>	Submersion <sup>1</sup>	-	-	4E-6	2E-8	-	-
9	Fluorine-18 <sup>2</sup>	D, fluorides of H, Li, Na, K, Rb, Cs, and Fr	5E+4	7E+4	3E-5	1E-7	-	-
		St wall (5E+4)	-	-	-	-	7E-4	7E-3
		W, fluorides of Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, As, Sb, Bi, Fe, Ru, Os, Co, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, V, Nb, Ta, Mn, Tc, and Re	-	9E+4	4E-5	1E-7	-	-
		Y, lanthanum fluoride	-	8E+4	3E-5	1E-7	-	-
11	Sodium-22	D, all compounds	4E+2	6E+2	3E-7	9E-10	6E-6	6E-5
11	Sodium-24	D, all compounds	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
12	Magnesium-28	D, all compounds except those given for W	7E+2	2E+3	7E-7	2E-9	9E-6	9E-5
		W, oxides, hydroxides, carbides, halides, and nitrates	-	1E+3	5E-7	2E-9	-	-
13	Aluminum-26	D, all compounds except those given for W	4E+2	6E+1	3E-8	9E-11	6E-6	6E-5
		W, oxides, hydroxides, carbides, halides, and nitrates	-	9E+1	4E-8	1E-10	-	-
14	Silicon-31	D, all compounds except those given for W and Y	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
		W, oxides, hydroxides, carbides, and nitrates	-	3E+4	1E-5	5E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		Y, aluminosilicate glass	-	3E+4	1E-5	4E-8	-	-
14	Silicon-32	D, see $^{31}\text{Si}$	2E+3	2E+2	1E-7	3E-10	-	-
		LLI wall (3E+3)	-	-	-	4E-5	4E-4	
		W, see $^{31}\text{Si}$	-	1E+2	5E-8	2E-10	-	-
		Y, see $^{31}\text{Si}$	-	5E+0	2E-9	7E-12	-	-
15	Phosphorus-32	D, all compounds except phosphates given for W	6E+2	9E+2	4E-7	1E-9	9E-6	9E-5
		W, phosphates of $\text{Zn}^{2+}$ , $\text{S}^{3+}$ , $\text{Mg}^{2+}$ , $\text{Fe}^{3+}$ , $\text{Bi}^{3+}$ , and lanthanides	-	4E+2	2E-7	5E-10	-	-
15	Phosphorus-33	D, see $^{32}\text{P}$	6E+3	8E+3	4E-6	1E-8	8E-5	8E-4
		W, see $^{32}\text{P}$	-	3E+3	1E-6	4E-9	-	-
16	Sulfur-35	Vapor	-	1E+4	6E-6	2E-8	-	-
		D, sulfides and sulfates except those given for W	1E+4	2E+4	7E-6	2E-8	-	-
		LLI wall (8E+3)	-	-	-	-	1E-4	1E-3
		W, elemental sulfur, sulfides of Sr, Ba, Ge, Sn, Pb, As, Sb, Bi, Cu, Ag, Au, Zn, Cd, Hg, W, and Mo. Sulfates of Ca, Sr, Ba, Ra, As, Sb, and Bi	6E+3	-	-	-	-	-
17	Chlorine-36	D, chlorides of H, Li, Na, K, Rb, Cs, and Fr	2E+3	2E+3	1E-6	3E-9	2E-5	2E-4
		W, chlorides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, and Re	-	2E+2	1E-7	3E-10	-	-
17	Chlorine-38 <sup>2</sup>	D, see $^{36}\text{Cl}$	2E+4	4E+4	2E-5	6E-8	-	-
		St wall (3E+4)	-	-	-	-	3E-4	3E-3
		W, see $^{36}\text{Cl}$	-	5E+4	2E-5	6E-8	-	-
17	Chlorine-39 <sup>2</sup>	D, see $^{36}\text{Cl}$	2E+4	5E+4	2E-5	7E-8	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
		W, see $^{36}\text{Cl}$	-	6E+4	2E-5	8E-8	-	-
18	Argon-37	Submersion <sup>1</sup>	-	-	1E+0	6E-3	-	-
18	Argon-39	Submersion <sup>1</sup>	-	-	2E-4	8E-7	-	-
18	Argon-41	Submersion <sup>1</sup>	-	-	3E-6	1E-8	-	-
19	Potassium-40	D, all compounds	3E+2	4E+2	2E-7	6E-10	4E-6	4E-5
19	Potassium-42	D, all compounds	5E+3	5E+3	2E-6	7E-9	6E-5	6E-4
19	Potassium-43	D, all compounds	6E+3	9E+3	4E-6	1E-8	9E-5	9E-4
19	Potassium-44 <sup>2</sup>	D, all compounds	2E+4	7E+4	3E-5	9E-8	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
19	Potassium-45 <sup>2</sup>	D, all compounds	3E+4	1E+5	5E-5	2E-7	-	-
		St wall (5E+4)	-	-	-	-	7E-4	7E-3

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
20	Calcium-41	W, all compounds	3E+3	4E+3	2E-6	-	-	-
			Bone surf (4E+3)	Bone surf (4E+3)	-	5E-9	6E-5	6E-4
20	Calcium-45	W, all compounds	2E+3	8E+2	4E-7	1E-9	2E-5	2E-4
20	Calcium-47	W, all compounds	8E+2	9E+2	4E-7	1E-9	1E-5	1E-4
21	Scandium-43	Y, all compounds	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
21	Scandium-44m	Y, all compounds	5E+2	7E+2	3E-7	1E-9	7E-6	7E-5
21	Scandium-44	Y, all compounds	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
21	Scandium-46	Y, all compounds	9E+2	2E+2	1E-7	3E-10	1E-5	1E-4
21	Scandium-47	Y, all compounds	2E+3	3E+3	1E-6	4E-9	-	-
			LLI wall (3E+3)	-	-	-	4E-5	4E-4
21	Scandium-48	Y, all compounds	8E+2	1E+3	6E-7	2E-9	1E-5	1E-4
21	Scandium-49 <sup>2</sup>	Y, all compounds	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3
22	Titanium-44	D, all compounds except those given for W and Y	3E+2	1E+1	5E-9	2E-11	4E-6	4E-5
		W, oxides, hydroxides, carbides, halides, and nitrates	-	3E+1	1E-8	4E-11	-	-
		Y, SrTiO <sub>3</sub>	-	6E+0	2E-9	8E-12	-	-
22	Titanium-45	D, see <sup>44</sup> Ti	9E+3	3E+4	1E-5	3E-8	1E-4	1E-3
		W, see <sup>44</sup> Ti	-	4E+4	1E-5	5E-8	-	-
		Y, see <sup>44</sup> Ti	-	3E+4	1E-5	4E-8	-	-
23	Vanadium-47 <sup>2</sup>	D, all compounds except those given for W	3E+4	8E+4	3E-5	1E-7	-	-
		St wall (3E+4)	-	-	-	-	4E-4	4E-3
		W, oxides, hydroxides, carbides, and halides	-	1E+5	4E-5	1E-7	-	-
23	Vanadium-48	D, see <sup>47</sup> V	6E+2	1E+3	5E-7	2E-9	9E-6	9E-5
		W, see <sup>47</sup> V	-	6E+2	3E-7	9E-10	-	-
23	Vanadium-49	D, see <sup>49</sup> V	7E+4	3E+4	1E-5	-	-	-
		LLI wall (9E+4)	Bone surf (3E+4)	-	5E-8	1E-3	1E-2	
		W, see <sup>49</sup> V	-	2E+4	8E-6	2E-8	-	-
24	Chromium-48	D, all compounds except those given for W and Y	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
		W, halides and nitrates	-	7E+3	3E-6	1E-8	-	-
		Y, oxides and hydroxides	-	7E+3	3E-6	1E-8	-	-
24	Chromium-49 <sup>2</sup>	D, see <sup>48</sup> Cr	3E+4	8E+4	4E-5	1E-7	4E-4	4E-3
		W, see <sup>48</sup> Cr	-	1E+5	4E-5	1E-7	-	-
		Y, see <sup>48</sup> Cr	-	9E+4	4E-5	1E-7	-	-
24	Chromium-51	D, see <sup>48</sup> Cr	4E+4	5E+4	2E-5	6E-8	5E-4	5E-3
		W, see <sup>48</sup> Cr	-	2E+4	1E-5	3E-8	-	-
		Y, see <sup>48</sup> Cr	-	2E+4	8E-6	3E-8	-	-
25	Manganese-51 <sup>2</sup>	D, all compounds except those given for W	2E+4	5E+4	2E-5	7E-8	3E-4	3E-3
		W, oxides, hydroxides, halides, and nitrates	-	6E+4	3E-5	8E-8	-	-
25	Manganese-52m <sup>2</sup>	D, see <sup>51</sup> Mn	3E+4	9E+4	4E-5	1E-7	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
		W, see <sup>51</sup> Mn	-	1E+5	4E-5	1E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration (μCi/ml)
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	
ALI (μCi)	DAC (μCi/ml)							
25	Manganese-52	D, see <sup>51</sup> Mn	7E+2	1E+3	5E-7	2E-9	1E-5	1E-4
		W, see <sup>51</sup> Mn	-	9E+2	4E-7	1E-9	-	-
25	Manganese-53	D, see <sup>51</sup> Mn	5E+4	1E+4	5E-6	-	7E-4	7E-3
			-	Bone surf (2E+4)	-	3E-8	-	-
		W, see <sup>51</sup> Mn	-	1E+4	5E-6	2E-8	-	-
25	Manganese-54	D, see <sup>51</sup> Mn	2E+3	9E+2	4E-7	1E-9	3E-5	3E-4
		W, see <sup>51</sup> Mn	-	8E+2	3E-7	1E-9	-	-
25	Manganese-56	D, see <sup>51</sup> Mn	5E+3	2E+4	6E-6	2E-8	7E-5	7E-4
		W, see <sup>51</sup> Mn	-	2E+4	9E-6	3E-8	-	-
26	Iron-52	D, all compounds except those given for W	9E+2	3E+3	1E-6	4E-9	1E-5	1E-4
		W, oxides, hydroxides, and halides	-	2E+3	1E-6	3E-9	-	-
26	Iron-55	D, see <sup>52</sup> Fe	9E+3	2E+3	8E-7	3E-9	1E-4	1E-3
		W, see <sup>52</sup> Fe	-	4E+3	2E-6	6E-9	-	-
26	Iron-59	D, see <sup>52</sup> Fe	8E+2	3E+2	1E-7	5E-10	1E-5	1E-4
		W, see <sup>52</sup> Fe	-	5E+2	2E-7	7E-10	-	-
26	Iron-60	D, see <sup>52</sup> Fe	3E+1	6E+0	3E-9	9E-12	4E-7	4E-6
		W, see <sup>52</sup> Fe	-	2E+1	8E-9	3E-11	-	-
27	Cobalt-55	W, all compounds except those given for Y	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
		Y, oxides, hydroxides, halides, and nitrates	-	3E+3	1E-6	4E-9	-	-
27	Cobalt-56	W, see <sup>55</sup> Co	5E+2	3E+2	1E-7	4E-10	6E-6	6E-5
		Y, see <sup>55</sup> Co	4E+2	2E+2	8E-8	3E-10	-	-
27	Cobalt-57	W, see <sup>55</sup> Co	8E+3	3E+3	1E-6	4E-9	6E-5	6E-4
		Y, see <sup>55</sup> Co	4E+3	7E+2	3E-7	9E-10	-	-
27	Cobalt-58m	W, see <sup>55</sup> Co	6E+4	9E+4	4E-5	1E-7	8E-4	8E-3
		Y, see <sup>55</sup> Co	-	6E+4	3E-5	9E-8	-	-
27	Cobalt-58	W, see <sup>55</sup> Co	2E+3	1E+3	5E-7	2E-9	2E-5	2E-4
		Y, see <sup>55</sup> Co	1E+3	7E+2	3E-7	1E-9	-	-
27	Cobalt-60m <sup>2</sup>	W, see <sup>55</sup> Co	1E+6	4E+6	2E-3	6E-6	-	-
		St wall (1E+6)	-	-	-	-	2E-2	2E-1
		Y, see <sup>55</sup> Co	-	3E+6	1E-3	4E-6	-	-
27	Cobalt-60	W, see <sup>55</sup> Co	5E+2	2E+2	7E-8	2E-10	3E-6	3E-5
		Y, see <sup>55</sup> Co	2E+2	3E+1	1E-8	5E-11	-	-
27	Cobalt-61 <sup>2</sup>	W, see <sup>55</sup> Co	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
		Y, see <sup>55</sup> Co	2E+4	6E+4	2E-5	8E-8	-	-
27	Cobalt-62m <sup>2</sup>	W, see <sup>55</sup> Co	4E+4	2E+5	7E-5	2E-7	-	-
		St wall (5E+4)	-	-	-	-	7E-4	7E-3
		Y, see <sup>55</sup> Co	-	2E+5	6E-5	2E-7	-	-
28	Nickel-56	D, all compounds except those given for W	1E+3	2E+3	8E-7	3E-9	2E-5	2E-4
		W, oxides, hydroxides, and carbides	-	1E+3	5E-7	2E-9	-	-
		Vapor	-	1E+3	5E-7	2E-9	-	-
28	Nickel-57	D, see <sup>56</sup> Ni	2E+3	5E+3	2E-6	7E-9	2E-5	2E-4
		W, see <sup>56</sup> Ni	-	3E+3	1E-6	4E-9	-	-
		Vapor	-	6E+3	3E-6	9E-9	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )							
28	Nickel-59	D, see $^{56}\text{Ni}$	2E+4	4E+3	2E-6	5E-9	3E-4	3E-3
		W, see $^{56}\text{Ni}$	-	7E+3	3E-6	1E-8	-	-
		Vapor	-	2E+3	8E-7	3E-9	-	-
28	Nickel-63	D, see $^{56}\text{Ni}$	9E+3	2E+3	7E-7	2E-9	1E-4	1E-3
		W, see $^{56}\text{Ni}$	-	3E+3	1E-6	4E-9	-	-
		Vapor	-	8E+2	3E-7	1E-9	-	-
28	Nickel-65	D, see $^{58}\text{Ni}$	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
		W, see $^{56}\text{Ni}$	-	3E+4	1E-5	4E-8	-	-
		Vapor	-	2E+4	7E-6	2E-8	-	-
28	Nickel-66	D, see $^{56}\text{Ni}$	4E+2	2E+3	7E-7	2E-9	-	-
		LLI wall (5E+2)	-	-	-	-	6E-6	6E-5
		W, see $^{56}\text{Ni}$	-	6E+2	3E-7	9E-10	-	-
29	Copper-60 <sup>2</sup>	Vapor	-	3E+3	1E-6	4E-9	-	-
		D, all compounds except those given for W and Y	3E+4	9E+4	4E-5	1E-7	-	-
		St wall (3E+4)	-	-	-	-	4E-4	4E-3
29	Copper-61	W, sulfides, halides, and nitrates	-	1E+5	5E-5	2E-7	-	-
		Y, oxides and hydroxides	-	1E+5	4E-5	1E-7	-	-
		D, see $^{60}\text{Cu}$	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
29	Copper-64	W, see $^{60}\text{Cu}$	-	4E+4	2E-5	6E-8	-	-
		Y, see $^{60}\text{Cu}$	-	4E+4	1E-5	5E-8	-	-
		D, see $^{60}\text{Cu}$	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
29	Copper-67	W, see $^{60}\text{Cu}$	-	2E+4	1E-5	3E-8	-	-
		Y, see $^{60}\text{Cu}$	-	2E+4	9E-6	3E-8	-	-
		D, see $^{60}\text{Cu}$	5E+3	8E+3	3E-6	1E-8	6E-5	6E-4
30	Zinc-62	W, see $^{60}\text{Cu}$	-	5E+3	2E-6	7E-9	-	-
		Y, see $^{60}\text{Cu}$	-	5E+3	2E-6	6E-9	-	-
		D, all compounds	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
30	Zinc-63 <sup>2</sup>	Y, all compounds	2E+4	7E+4	3E-5	9E-8	-	-
		St wall (3E+4)	-	-	-	-	3E-4	3E-3
30	Zinc-65	Y, all compounds	4E+2	3E+2	1E-7	4E-10	5E-6	5E-5
30	Zinc-69m	Y, all compounds	4E+3	7E+3	3E-6	1E-8	6E-5	6E-4
30	Zinc-69 <sup>2</sup>	Y, all compounds	6E+4	1E+5	6E-5	2E-7	8E-4	8E-3
30	Zinc-71m	Y, all compounds	6E+3	2E+4	7E-6	2E-8	8E-5	8E-4
30	Zinc-72	Y, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
31	Gallium-65 <sup>2</sup>	D, all compounds except those given for W	5E+4	2E+5	7E-5	2E-7	-	-
		St wall (6E+4)	-	-	-	-	9E-4	9E-3
		W, oxides, hydroxides, carbides, halides, and nitrates	-	2E+5	8E-5	3E-7	-	-
31	Gallium-66	D, see $^{65}\text{Ga}$	1E+3	4E+3	1E-6	5E-9	1E-5	1E-4
		W, see $^{65}\text{Ga}$	-	3E+3	1E-6	4E-9	-	-
31	Gallium-67	D, see $^{65}\text{Ga}$	7E+3	1E+4	6E-6	2E-8	1E-4	1E-3
		W, see $^{65}\text{Ga}$	-	1E+4	4E-6	1E-8	-	-
31	Gallium-68 <sup>2</sup>	D, see $^{65}\text{Ga}$	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{65}\text{Ga}$	-	5E+4	2E-5	7E-8	-	-
31	Gallium-70 <sup>2</sup>	D, see $^{65}\text{Ga}$	5E+4	2E+5	7E-5	2E-7	-	-
		St wall (7E+4)	-	-	-	-	1E-3	1E-2
		W, see $^{65}\text{Ga}$	-	2E+5	8E-5	3E-7	-	-
31	Gallium-72	D, see $^{65}\text{Ga}$	1E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		W, see $^{65}\text{Ga}$	-	3E+3	1E-6	4E-9	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
				ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )			
31	Gallium-73	D, see $^{65}\text{Ga}$	5E+3	2E+4	6E-6	2E-8	7E-5	7E-4
		W, see $^{65}\text{Ga}$	-	2E+4	6E-6	2E-8	-	-
32	Germanium-66	D, all compounds except those given for W	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
		W, oxides, sulfides, and halides	-	2E+4	8E-6	3E-8	-	-
32	Germanium-67 <sup>2</sup>	D, see $^{66}\text{Ge}$	3E+4	9E+4	4E-5	1E-7	-	-
		St wall (4E+4)	-	-	-	-	6E-4	6E-3
		W, see $^{66}\text{Ge}$	-	1E+5	4E-5	1E-7	-	-
32	Germanium-68	D, see $^{66}\text{Ge}$	5E+3	4E+3	2E-6	5E-9	6E-5	6E-4
		W, see $^{66}\text{Ge}$	-	1E+2	4E-8	1E-10	-	-
32	Germanium-69	D, see $^{66}\text{Ge}$	1E+4	2E+4	6E-6	2E-8	2E-4	2E-3
		W, see $^{66}\text{Ge}$	-	8E+3	3E-6	1E-8	-	-
32	Germanium-71	D, see $^{66}\text{Ge}$	5E+5	4E+5	2E-4	6E-7	7E-3	7E-2
		W, see $^{66}\text{Ge}$	-	4E+4	2E-5	6E-8	-	-
32	Germanium-75 <sup>2</sup>	D, see $^{66}\text{Ge}$	4E+4	8E+4	3E-5	1E-7	-	-
		St wall (7E+4)	-	-	-	-	9E-4	9E-3
		W, see $^{66}\text{Ge}$	-	8E+4	4E-5	1E-7	-	-
32	Germanium-77	D, see $^{66}\text{Ge}$	9E+3	1E+4	4E-6	1E-8	1E-4	1E-3
		W, see $^{66}\text{Ge}$	-	6E+3	2E-6	8E-9	-	-
32	Germanium-78 <sup>2</sup>	D, see $^{66}\text{Ge}$	2E+4	2E+4	9E-6	3E-8	-	-
		St wall (2E+4)	-	-	-	-	3E-4	3E-3
		W, see $^{66}\text{Ge}$	-	2E+4	9E-6	3E-8	-	-
33	Arsenic-69 <sup>2</sup>	W, all compounds	3E+4	1E+5	5E-5	2E-7	-	-
		St wall (4E+4)	-	-	-	-	6E-4	6E-3
33	Arsenic-70 <sup>2</sup>	W, all compounds	1E+4	5E+4	2E-5	7E-8	2E-4	2E-3
33	Arsenic-71	W, all compounds	4E+3	5E+3	2E-6	6E-9	5E-5	5E-4
33	Arsenic-72	W, all compounds	9E+2	1E+3	6E-7	2E-9	1E-5	1E-4
33	Arsenic-73	W, all compounds	8E+3	2E+3	7E-7	2E-9	1E-4	1E-3
33	Arsenic-74	W, all compounds	1E+3	8E+2	3E-7	1E-9	2E-5	2E-4
33	Arsenic-76	W, all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4
33	Arsenic-77	W, all compounds	4E+3	5E+3	2E-6	7E-9	-	-
		LLI wall (5E+3)	-	-	-	-	6E-5	6E-4
33	Arsenic-78 <sup>2</sup>	W, all compounds	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
34	Selenium-70 <sup>2</sup>	D, all compounds except those given for W	2E+4	4E+4	2E-5	5E-8	1E-4	1E-3
		W, oxides, hydroxides, carbides, and elemental Se	1E+4	4E+4	2E-5	6E-8	-	-
34	Selenium-73m <sup>2</sup>	D, see $^{70}\text{Se}$	6E+4	2E+5	6E-5	2E-7	4E-4	4E-3
		W, see $^{70}\text{Se}$	3E+4	1E+5	6E-5	2E-7	-	-
34	Selenium-73	D, see $^{70}\text{Se}$	3E+3	1E+4	5E-6	2E-8	4E-5	4E-4
		W, see $^{70}\text{Se}$	-	2E+4	7E-6	2E-8	-	-
34	Selenium-75	D, see $^{70}\text{Se}$	5E+2	7E+2	3E-7	1E-9	7E-6	7E-5
		W, see $^{70}\text{Se}$	-	6E+2	3E-7	8E-10	-	-
34	Selenium-79	D, see $^{70}\text{Se}$	6E+2	8E+2	3E-7	1E-9	8E-6	8E-5
		W, see $^{70}\text{Se}$	-	6E+2	2E-7	8E-10	-	-
34	Selenium-81m <sup>2</sup>	D, see $^{70}\text{Se}$	4E+4	7E+4	3E-5	9E-8	3E-4	3E-3
		W, see $^{70}\text{Se}$	2E+4	7E+4	3E-5	1E-7	-	-
34	Selenium-81 <sup>2</sup>	D, see $^{70}\text{Se}$	6E+4	2E+5	9E-5	3E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
		ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )					
			St wall (8E+4)	-	-	-	1E-3	1E-2
		W, see $^{70}\text{Se}$	-	2E+5	1E-4	3E-7	-	-
34	Selenium-83 <sup>2</sup>	D, see $^{70}\text{Se}$	4E+4	1E+5	5E-5	2E-7	4E-4	4E-3
		W, see $^{70}\text{Se}$	3E+4	1E+5	5E-5	2E-7	-	-
35	Bromine-74m <sup>2</sup>	D, bromides of H, Li, Na, K, Rb, Cs, and Fr	1E+4	4E+4	2E-5	5E-8	-	-
		St wall (2E+4)	-	-	-	-	3E-4	3E-3
		W, bromides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Tl, Zr, Hf, V, Nb, Ta, Mn, Tc, and Re	-	4E+4	2E-5	6E-8	-	-
35	Bromine-74 <sup>2</sup>	D, see $^{74m}\text{Br}$	2E+4	7E+4	3E-5	1E-7	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
		W, see $^{74m}\text{Br}$	-	8E+4	4E-5	1E-7	-	-
35	Bromine-75 <sup>2</sup>	D, see $^{74m}\text{Br}$	3E+4	5E+4	2E-5	7E-8	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
		W, see $^{74m}\text{Br}$	-	5E+4	2E-5	7E-8	-	-
35	Bromine-76	D, see $^{74m}\text{Br}$	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
		W, see $^{74m}\text{Br}$	-	4E+3	2E-6	6E-9	-	-
35	Bromine-77	D, see $^{74m}\text{Br}$	2E+4	2E+4	1E-5	3E-8	2E-4	2E-3
		W, see $^{74m}\text{Br}$	-	2E+4	8E-6	3E-8	-	-
35	Bromine-80m	D, see $^{74m}\text{Br}$	2E+4	2E+4	7E-6	2E-8	3E-4	3E-3
		W, see $^{74m}\text{Br}$	-	1E+4	6E-6	2E-8	-	-
35	Bromine-80 <sup>2</sup>	D, see $^{74m}\text{Br}$	5E+4	2E+5	8E-5	3E-7	-	-
		St wall (9E+4)	-	-	-	-	1E-3	1E-2
		W, see $^{74m}\text{Br}$	-	2E+5	9E-5	3E-7	-	-
35	Bromine-82	D, see $^{74m}\text{Br}$	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
		W, see $^{74m}\text{Br}$	-	4E+3	2E-6	5E-9	-	-
35	Bromine-83	D, see $^{74m}\text{Br}$	5E+4	6E+4	3E-5	9E-8	-	-
		St wall (7E+4)	-	-	-	-	9E-4	9E-3
		W, see $^{74m}\text{Br}$	-	6E+4	3E-5	9E-8	-	-
35	Bromine-84 <sup>2</sup>	D, see $^{74m}\text{Br}$	2E+4	6E+4	2E-5	8E-8	-	-
		St wall (3E+4)	-	-	-	-	4E-4	4E-3
		W, see $^{74m}\text{Br}$	-	6E+4	3E-5	9E-8	-	-
36	Krypton-74 <sup>2</sup>	Submersion <sup>1</sup>	-	-	3E-6	1E-8	-	-
36	Krypton-76	Submersion <sup>1</sup>	-	-	9E-6	4E-8	-	-
36	Krypton-77 <sup>2</sup>	Submersion <sup>1</sup>	-	-	4E-6	2E-8	-	-
36	Krypton-79	Submersion <sup>1</sup>	-	-	2E-5	7E-8	-	-
36	Krypton-81	Submersion <sup>1</sup>	-	-	7E-4	3E-6	-	-
36	Krypton-83m <sup>2</sup>	Submersion <sup>1</sup>	-	-	1E-2	5E-5	-	-
36	Krypton-85m	Submersion <sup>1</sup>	-	-	2E-5	1E-7	-	-
36	Krypton-85	Submersion <sup>1</sup>	-	-	1E-4	7E-7	-	-
36	Krypton-87 <sup>2</sup>	Submersion <sup>1</sup>	-	-	5E-6	2E-8	-	-
36	Krypton-88	Submersion <sup>1</sup>	-	-	2E-6	9E-9	-	-
37	Rubidium-79 <sup>2</sup>	D, all compounds	4E+4	1E+5	5E-5	2E-7	-	-
		St wall (6E+4)	-	-	-	-	8E-4	8E-3

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
37	Rubidium-81m <sup>2</sup>	D, all compounds	2E+5	3E+5	1E-4	5E-7	-	-
			St wall (3E+5)	-	-	-	4E-3	4E-2
37	Rubidium-81	D, all compounds	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
37	Rubidium-82m	D, all compounds	1E+4	2E+4	7E-6	2E-8	2E-4	2E-3
37	Rubidium-83	D, all compounds	6E+2	1E+3	4E-7	1E-9	9E-6	9E-5
37	Rubidium-84	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37	Rubidium-86	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37	Rubidium-87	D, all compounds	1E+3	2E+3	6E-7	2E-9	1E-5	1E-4
37	Rubidium-88 <sup>2</sup>	D, all compounds	2E+4	6E+4	3E-5	9E-8	-	-
			St wall (3E+4)	-	-	-	4E-4	4E-3
37	Rubidium-89 <sup>2</sup>	D, all compounds	4E+4	1E+5	6E-5	2E-7	-	-
			St wall (6E+4)	-	-	-	9E-4	9E-3
38	Strontium-80 <sup>2</sup>	D, all soluble compounds except SrTiO <sub>3</sub>	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
		Y, all insoluble compounds and SrTiO <sub>3</sub>	-	1E+4	5E-6	2E-8	-	-
38	Strontium-81 <sup>2</sup>	D, see <sup>80</sup> Sr	3E+4	8E+4	3E-5	1E-7	3E-4	3E-3
		Y, see <sup>80</sup> Sr	2E+4	8E+4	3E-5	1E-7	-	-
38	Strontium-82	D, see <sup>80</sup> Sr	3E+2	4E+2	2E-7	6E-10	-	-
		LLI wall (2E+2)	-	-	-	-	3E-6	3E-5
		Y, see <sup>80</sup> Sr	2E+2	9E+1	4E-8	1E-10	-	-
38	Strontium-83	D, see <sup>80</sup> Sr	3E+3	7E+3	3E-6	1E-8	3E-5	3E-4
		Y, see <sup>80</sup> Sr	2E+3	4E+3	1E-6	5E-9	-	-
38	Strontium-85m <sup>2</sup>	D, see <sup>80</sup> Sr	2E+5	6E+5	3E-4	9E-7	3E-3	3E-2
		Y, see <sup>80</sup> Sr	-	8E+5	4E-4	1E-6	-	-
38	Strontium-85	D, see <sup>80</sup> Sr	3E+3	3E+3	1E-6	4E-9	4E-5	4E-4
		Y, see <sup>80</sup> Sr	-	2E+3	6E-7	2E-9	-	-
38	Strontium-87m	D, see <sup>80</sup> Sr	5E+4	1E+5	5E-5	2E-7	6E-4	6E-3
		Y, see <sup>80</sup> Sr	4E+4	2E+5	6E-5	2E-7	-	-
38	Strontium-89	D, see <sup>80</sup> Sr	6E+2	8E+2	4E-7	1E-9	-	-
		LLI wall (6E+2)	-	-	-	-	8E-6	8E-5
		Y, see <sup>80</sup> Sr	5E+2	1E+2	6E-8	2E-10	-	-
38	Strontium-90	D, see <sup>80</sup> Sr	3E+1	2E+1	8E-9	-	-	-
		Bone surf (4E+1)	-	Bone surf (2E+1)	-	3E-11	5E-7	5E-6
		Y, see <sup>80</sup> Sr	-	4E+0	2E-9	6E-12	-	-
38	Strontium-91	D, see <sup>80</sup> Sr	2E+3	6E+3	2E-6	8E-9	2E-5	2E-4
		Y, see <sup>80</sup> Sr	-	4E+3	1E-6	5E-9	-	-
38	Strontium-92	D, see <sup>80</sup> Sr	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
		Y, see <sup>80</sup> Sr	-	7E+3	3E-6	9E-9	-	-
39	Yttrium-86m <sup>2</sup>	W, all compounds except those given for Y	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
		Y, oxides and hydroxides	-	5E+4	2E-5	8E-8	-	-
39	Yttrium-86	W, see <sup>86m</sup> Y	1E+3	3E+3	1E-6	5E-9	2E-5	2E-4
		Y, see <sup>86m</sup> Y	-	3E+3	1E-6	5E-9	-	-
39	Yttrium-87	W, see <sup>86m</sup> Y	2E+3	3E+3	1E-6	5E-9	3E-5	3E-4
		Y, see <sup>86m</sup> Y	-	3E+3	1E-6	5E-9	-	-
39	Yttrium-88	W, see <sup>86m</sup> Y	1E+3	3E+2	1E-7	3E-10	1E-5	1E-4
		Y, see <sup>86m</sup> Y	-	2E+2	1E-7	3E-10	-	-
39	Yttrium-90m	W, see <sup>86m</sup> Y	8E+3	1E+4	5E-6	2E-8	1E-4	1E-3
		Y, see <sup>86m</sup> Y	-	1E+4	5E-6	2E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
39	Yttrium-90	W, see $^{86m}\text{Y}$	4E+2	7E+2	3E-7	9E-10	-	-
		LLI wall (5E+2)	-	-	-	-	7E-6	7E-5
39	Yttrium-91 <sup>m2</sup>	Y, see $^{86m}\text{Y}$	-	6E+2	3E-7	9E-10	-	-
		W, see $^{86m}\text{Y}$	1E+5	2E+5	1E-4	3E-7	2E-3	2E-2
39	Yttrium-91	Y, see $^{86m}\text{Y}$	-	2E+5	7E-5	2E-7	-	-
		W, see $^{86m}\text{Y}$	5E+2	2E+2	7E-8	2E-10	-	-
39	Yttrium-92	LLI wall (6E+2)	-	-	-	-	8E-6	8E-5
		Y, see $^{86m}\text{Y}$	-	1E+2	5E-8	2E-10	-	-
39	Yttrium-93	W, see $^{86m}\text{Y}$	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
		Y, see $^{86m}\text{Y}$	-	8E+3	3E-6	1E-8	-	-
39	Yttrium-94 <sup>z</sup>	W, see $^{86m}\text{Y}$	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
		Y, see $^{86m}\text{Y}$	-	2E+3	1E-6	3E-9	-	-
39	Yttrium-95 <sup>z</sup>	W, see $^{86m}\text{Y}$	2E+4	8E+4	3E-5	1E-7	-	-
		St wall (3E+4)	-	-	-	-	4E-4	4E-3
39	Yttrium-95 <sup>z</sup>	Y, see $^{86m}\text{Y}$	-	8E+4	3E-5	1E-7	-	-
		W, see $^{86m}\text{Y}$	4E+4	2E+5	6E-5	2E-7	-	-
40	Zirconium-86	St wall (5E+4)	-	-	-	-	7E-4	7E-3
		Y, see $^{86m}\text{Y}$	-	1E+5	6E-5	2E-7	-	-
40	Zirconium-88	D, all compounds except those given for W and Y	1E+3	4E+3	2E-6	6E-9	2E-5	2E-4
		W, oxides, hydroxides, halides, and nitrates	-	3E+3	1E-6	4E-9	-	-
		Y, carbide	-	2E+3	1E-6	3E-9	-	-
40	Zirconium-89	D, see $^{86}\text{Zr}$	4E+3	2E+2	9E-8	3E-10	5E-5	5E-4
		W, see $^{86}\text{Zr}$	-	5E+2	2E-7	7E-10	-	-
		Y, see $^{86}\text{Zr}$	-	3E+2	1E-7	4E-10	-	-
40	Zirconium-93	D, see $^{86}\text{Zr}$	2E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		W, see $^{86}\text{Zr}$	-	2E+3	1E-6	3E-9	-	-
		Y, see $^{86}\text{Zr}$	-	2E+3	1E-6	3E-9	-	-
40	Zirconium-95	D, see $^{86}\text{Zr}$	1E+3	6E+0	3E-9	-	-	-
		Bone surf (3E+3)	-	Bone surf (2E+1)	-	2E-11	4E-5	4E-4
		W, see $^{86}\text{Zr}$	-	2E+1	1E-8	-	-	-
		Y, see $^{86}\text{Zr}$	-	Bone surf (6E+1)	-	9E-11	-	-
40	Zirconium-97	D, see $^{86}\text{Zr}$	-	6E+1	2E-8	-	-	-
		W, see $^{86}\text{Zr}$	1E+3	1E+2	5E-8	-	2E-5	2E-4
		Y, see $^{86}\text{Zr}$	-	Bone surf (3E+2)	-	4E-10	-	-
40	Zirconium-97	W, see $^{86}\text{Zr}$	-	4E+2	2E-7	5E-10	-	-
		Y, see $^{86}\text{Zr}$	-	3E+2	1E-7	4E-10	-	-
		D, see $^{86}\text{Zr}$	6E+2	2E+3	8E-7	3E-9	9E-6	9E-5
41	Niobium-88 <sup>z</sup>	W, see $^{86}\text{Zr}$	-	1E+3	6E-7	2E-9	-	-
		Y, see $^{86}\text{Zr}$	-	1E+3	5E-7	2E-9	-	-
		W, all compounds except those given for Y	5E+4	2E+5	9E-5	3E-7	-	-
41	Niobium-89 <sup>z</sup> (66 min)	St wall (7E+4)	-	-	-	-	1E-3	1E-2
		Y, oxides and hydroxides	-	2E+5	9E-5	3E-7	-	-
41	Niobium-89 <sup>z</sup> (66 min)	W, see $^{88}\text{Nb}$	1E+4	4E+4	2E-5	6E-8	1E-4	1E-3
		Y, see $^{88}\text{Nb}$	-	4E+4	2E-5	5E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration (μCi/ml)
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	
ALI (μCi)	DAC (μCi/ml)							
41	Niobium-89 (122 min)	W, see <sup>88</sup> Nb	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
		Y, see <sup>88</sup> Nb	-	2E+4	6E-6	2E-8	-	-
41	Niobium-90	W, see <sup>88</sup> Nb	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
		Y, see <sup>88</sup> Nb	-	2E+3	1E-6	3E-9	-	-
41	Niobium-93m	W, see <sup>88</sup> Nb	9E+3	2E+3	8E-7	3E-9	-	-
		LLI wall (1E+4)	-	-	-	-	2E-4	2E-3
		Y, see <sup>88</sup> Nb	-	2E+2	7E-8	2E-10	-	-
41	Niobium-94	W, see <sup>88</sup> Nb	9E+2	2E+2	8E-8	3E-10	1E-5	1E-4
		Y, see <sup>88</sup> Nb	-	2E+1	6E-9	2E-11	-	-
41	Niobium-95m	W, see <sup>88</sup> Nb	2E+3	3E+3	1E-6	4E-9	-	-
		LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
		Y, see <sup>88</sup> Nb	-	2E+3	9E-7	3E-9	-	-
41	Niobium-95	W, see <sup>88</sup> Nb	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
		Y, see <sup>88</sup> Nb	-	1E+3	5E-7	2E-9	-	-
41	Niobium-96	W, see <sup>88</sup> Nb	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
		Y, see <sup>88</sup> Nb	-	2E+3	1E-6	3E-9	-	-
41	Niobium-97 <sup>2</sup>	W, see <sup>88</sup> Nb	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
		Y, see <sup>88</sup> Nb	-	7E+4	3E-5	1E-7	-	-
41	Niobium-98 <sup>2</sup>	W, see <sup>88</sup> Nb	1E+4	5E+4	2E-5	8E-8	2E-4	2E-3
		Y, see <sup>88</sup> Nb	-	5E+4	2E-5	7E-8	-	-
42	Molybdenum-90	D, all compounds except those given for Y	4E+3	7E+3	3E-6	1E-8	3E-5	3E-4
		Y, oxides, hydroxide, and MoS <sub>2</sub>	2E+3	5E+3	2E-6	6E-9	-	-
42	Molybdenum-93m	D, see <sup>90</sup> Mo	9E+3	2E+4	7E-6	2E-8	6E-5	6E-4
		Y, see <sup>90</sup> Mo	4E+3	1E+4	6E-6	2E-8	-	-
42	Molybdenum-93	D, see <sup>90</sup> Mo	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
		Y, see <sup>90</sup> Mo	2E+4	2E+2	8E-8	2E-10	-	-
42	Molybdenum-99	D, see <sup>90</sup> Mo	2E+3	3E+3	1E-6	4E-9	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see <sup>90</sup> Mo	1E+3	1E+3	6E-7	2E-9	-	-
42	Molybdenum-101 <sup>2</sup>	D, see <sup>90</sup> Mo	4E+4	1E+5	6E-5	2E-7	-	-
		St wall (5E+4)	-	-	-	-	7E-4	7E-3
42	Molybdenum-101 <sup>2</sup>	Y, see <sup>90</sup> Mo	-	1E+5	6E-5	2E-7	-	-
43	Technetium-93m <sup>2</sup>	D, all compounds except those given for W	7E+4	2E+5	6E-5	2E-7	1E-3	1E-2
		W, oxides, hydroxides, halides, and nitrates	-	3E+5	1E-4	4E-7	-	-
43	Technetium-93	D, see <sup>93m</sup> Tc	3E+4	7E+4	3E-5	1E-7	4E-4	4E-3
		W, see <sup>93m</sup> Tc	-	1E+5	4E-5	1E-7	-	-
43	Technetium-94m <sup>2</sup>	D, see <sup>93m</sup> Tc	2E+4	4E+4	2E-5	6E-8	3E-4	3E-3
		W, see <sup>93m</sup> Tc	-	6E+4	2E-5	8E-8	-	-
43	Technetium-94	D, see <sup>93m</sup> Tc	9E+3	2E+4	8E-6	3E-8	1E-4	1E-3
		W, see <sup>93m</sup> Tc	-	2E+4	1E-5	3E-8	-	-
43	Technetium-95m	D, see <sup>93m</sup> Tc	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
		W, see <sup>93m</sup> Tc	-	2E+3	8E-7	3E-9	-	-
43	Technetium-95	D, see <sup>93m</sup> Tc	1E+4	2E+4	9E-6	3E-8	1E-4	1E-3
		W, see <sup>93m</sup> Tc	-	2E+4	8E-6	3E-8	-	-
43	Technetium-96m <sup>2</sup>	D, see <sup>93m</sup> Tc	2E+5	3E+5	1E-4	4E-7	2E-3	2E-2
		W, see <sup>93m</sup> Tc	-	2E+5	1E-4	3E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
43	Technetium-96	D, see $^{93\text{m}}\text{Tc}$	2E+3	3E+3	1E-6	5E-9	3E-5	3E-4
		W, see $^{93\text{m}}\text{Tc}$	-	2E+3	9E-7	3E-9	-	-
43	Technetium-97m	D, see $^{93\text{m}}\text{Tc}$	5E+3	7E+3	3E-6	-	6E-5	6E-4
		W, see $^{93\text{m}}\text{Tc}$	-	St Wall (7E+3)	-	1E-8	-	-
43	Technetium-97	D, see $^{93\text{m}}\text{Tc}$	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
		W, see $^{93\text{m}}\text{Tc}$	-	6E+3	2E-6	8E-9	-	-
43	Technetium-98	D, see $^{93\text{m}}\text{Tc}$	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
		W, see $^{93\text{m}}\text{Tc}$	-	3E+2	1E-7	4E-10	-	-
43	Technetium-99m	D, see $^{93\text{m}}\text{Tc}$	8E+4	2E+5	6E-5	2E-7	1E-3	1E-2
		W, see $^{93\text{m}}\text{Tc}$	-	2E+5	1E-4	3E-7	-	-
43	Technetium-99	D, see $^{93\text{m}}\text{Tc}$	4E+3	5E+3	2E-6	-	6E-5	6E-4
		W, see $^{93\text{m}}\text{Tc}$	-	St wall (6E+3)	-	8E-9	-	-
43	Technetium-101 <sup>2</sup>	D, see $^{93\text{m}}\text{Tc}$	9E+4	3E+5	1E-4	5E-7	-	-
		W, see $^{93\text{m}}\text{Tc}$	-	4E+5	2E-4	5E-7	-	-
43	Technetium-104 <sup>2</sup>	D, see $^{93\text{m}}\text{Tc}$	2E+4	7E+4	3E-5	1E-7	-	-
		W, see $^{93\text{m}}\text{Tc}$	-	9E+4	4E-5	1E-7	-	-
44	Ruthenium-94 <sup>2</sup>	D, all compounds except those given for W and Y	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, halides	-	6E+4	3E-5	9E-8	-	-
44	Ruthenium-97	D, see $^{94}\text{Ru}$	8E+3	2E+4	8E-6	3E-8	1E-4	1E-3
		W, see $^{94}\text{Ru}$	-	1E+4	5E-6	2E-8	-	-
		Y, see $^{94}\text{Ru}$	-	1E+4	5E-6	2E-8	-	-
44	Ruthenium-103	D, see $^{94}\text{Ru}$	2E+3	2E+3	7E-7	2E-9	3E-5	3E-4
		W, see $^{94}\text{Ru}$	-	1E+3	4E-7	1E-9	-	-
		Y, see $^{94}\text{Ru}$	-	6E+2	3E-7	9E-10	-	-
44	Ruthenium-105	D, see $^{94}\text{Ru}$	5E+3	1E+4	6E-6	2E-8	7E-5	7E-4
		W, see $^{94}\text{Ru}$	-	1E+4	6E-6	2E-8	-	-
		Y, see $^{94}\text{Ru}$	-	1E+4	5E-6	2E-8	-	-
44	Ruthenium-106	D, see $^{94}\text{Ru}$	2E+2	9E+1	4E-8	1E-10	-	-
		W, see $^{94}\text{Ru}$	-	5E+1	2E-8	8E-11	-	-
		Y, see $^{94}\text{Ru}$	-	1E+1	5E-9	2E-11	-	-
45	Rhodium-99m	D, all compounds except those given for W and Y	2E+4	6E+4	2E-5	8E-8	2E-4	2E-3
		W, halides	-	8E+4	3E-5	1E-7	-	-
		Y, oxides and hydroxides	-	7E+4	3E-5	9E-8	-	-
45	Rhodium-99	D, see $^{99\text{m}}\text{Rh}$	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
		W, see $^{99\text{m}}\text{Rh}$	-	2E+3	9E-7	3E-9	-	-
		Y, see $^{99\text{m}}\text{Rh}$	-	2E+3	8E-7	3E-9	-	-
45	Rhodium-100	D, see $^{99\text{m}}\text{Rh}$	2E+3	5E+3	2E-6	7E-9	2E-5	2E-4
		W, see $^{99\text{m}}\text{Rh}$	-	4E+3	2E-6	6E-9	-	-
		Y, see $^{99\text{m}}\text{Rh}$	-	4E+3	2E-6	5E-9	-	-
45	Rhodium-101m	D, see $^{99\text{m}}\text{Rh}$	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
		W, see $^{99\text{m}}\text{Rh}$	-	8E+3	4E-6	1E-8	-	-
		Y, see $^{99\text{m}}\text{Rh}$	-	8E+3	3E-6	1E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration (μCi/ml)
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	
ALI (μCi)	DAC (μCi/ml)							
45	Rhodium-101	D, see <sup>99m</sup> Rh	2E+3	5E+2	2E-7	7E-10	3E-5	3E-4
		W, see <sup>99m</sup> Rh	-	8E+2	3E-7	1E-9	-	-
		Y, see <sup>99m</sup> Rh	-	2E+2	6E-8	2E-10	-	-
45	Rhodium-102m	D, see <sup>99m</sup> Rh	1E+3	5E+2	2E-7	7E-10	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		W, see <sup>99m</sup> Rh	-	4E+2	2E-7	5E-10	-	-
45	Rhodium-102	Y, see <sup>99m</sup> Rh	-	1E+2	5E-8	2E-10	-	-
		D, see <sup>99m</sup> Rh	6E+2	9E+1	4E-8	1E-10	8E-6	8E-5
		W, see <sup>99m</sup> Rh	-	2E+2	7E-8	2E-10	-	-
45	Rhodium-103m <sup>2</sup>	Y, see <sup>99m</sup> Rh	-	6E+1	2E-8	8E-11	-	-
		D, see <sup>99m</sup> Rh	4E+5	1E+6	5E-4	2E-6	6E-3	6E-2
		W, see <sup>99m</sup> Rh	-	1E+6	5E-4	2E-6	-	-
45	Rhodium-105	Y, see <sup>99m</sup> Rh	-	1E+6	5E-4	2E-6	-	-
		D, see <sup>99m</sup> Rh	4E+3	1E+4	5E-6	2E-8	-	-
		LLI wall (4E+3)	-	-	-	-	5E-5	5E-4
45	Rhodium-106m	W, see <sup>99m</sup> Rh	-	6E+3	3E-6	9E-9	-	-
		Y, see <sup>99m</sup> Rh	-	6E+3	2E-6	8E-9	-	-
		D, see <sup>99m</sup> Rh	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
45	Rhodium-107 <sup>2</sup>	W, see <sup>99m</sup> Rh	-	4E+4	2E-5	5E-8	-	-
		Y, see <sup>99m</sup> Rh	-	4E+4	1E-5	5E-8	-	-
		D, see <sup>99m</sup> Rh	7E+4	2E+5	1E-4	3E-7	-	-
46	Palladium-100	St wall (9E+4)	-	-	-	-	1E-3	1E-2
		W, see <sup>99m</sup> Rh	-	3E+5	1E-4	4E-7	-	-
		Y, see <sup>99m</sup> Rh	-	3E+5	1E-4	3E-7	-	-
46	Palladium-101	D, all compounds except those given for W and Y	1E+3	1E+3	6E-7	2E-9	2E-5	2E-4
		W, nitrates	-	1E+3	5E-7	2E-9	-	-
		Y, oxides and hydroxides	-	1E+3	6E-7	2E-9	-	-
46	Palladium-103	D, see <sup>100</sup> Pd	1E+4	3E+4	1E-5	5E-8	2E-4	2E-3
		W, see <sup>100</sup> Pd	-	3E+4	1E-5	5E-8	-	-
		Y, see <sup>100</sup> Pd	-	3E+4	1E-5	4E-8	-	-
46	Palladium-107	D, see <sup>100</sup> Pd	6E+3	6E+3	3E-6	9E-9	-	-
		LLI wall (7E+3)	-	-	-	-	1E-4	1E-3
		W, see <sup>100</sup> Pd	-	4E+3	2E-6	6E-9	-	-
46	Palladium-109	Y, see <sup>100</sup> Pd	-	4E+3	1E-6	5E-9	-	-
		D, see <sup>100</sup> Pd	3E+4	2E+4	9E-6	-	-	-
		LLI wall (4E+4)	-	Kidneys (2E+4)	-	3E-8	5E-4	5E-3
46	Palladium-109	W, see <sup>100</sup> Pd	-	7E+3	3E-6	1E-8	-	-
		Y, see <sup>100</sup> Pd	-	4E+2	2E-7	6E-10	-	-
		D, see <sup>100</sup> Pd	2E+3	6E+3	3E-6	9E-9	3E-5	3E-4
47	Silver-102 <sup>2</sup>	W, see <sup>100</sup> Pd	-	5E+3	2E-6	8E-9	-	-
		Y, see <sup>100</sup> Pd	-	5E+3	2E-6	6E-9	-	-
		D, all compounds except those given for W and Y	5E+4	2E+5	8E-5	2E-7	-	-
47	Silver-103 <sup>2</sup>	St wall (6E+4)	-	-	-	-	9E-4	9E-3
		W, nitrates and sulfides	-	2E+5	9E-5	3E-7	-	-
		Y, oxides and hydroxides	-	2E+5	8E-5	3E-7	-	-
47	Silver-103 <sup>2</sup>	D, see <sup>102</sup> Ag	4E+4	1E+5	4E-5	1E-7	5E-4	5E-3
		W, see <sup>102</sup> Ag	-	1E+5	5E-5	2E-7	-	-
		Y, see <sup>102</sup> Ag	-	1E+5	5E-5	2E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
47	Silver-104m <sup>2</sup>	D, see <sup>102</sup> Ag	3E+4	9E+4	4E-5	1E-7	4E-4	4E-3
		W, see <sup>102</sup> Ag	-	1E+5	5E-5	2E-7	-	-
		Y, see <sup>102</sup> Ag	-	1E+5	5E-5	2E-7	-	-
47	Silver-104 <sup>2</sup>	D, see <sup>102</sup> Ag	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
		W, see <sup>102</sup> Ag	-	1E+5	6E-5	2E-7	-	-
		Y, see <sup>102</sup> Ag	-	1E+5	6E-5	2E-7	-	-
47	Silver-105	D, see <sup>102</sup> Ag	3E+3	1E+3	4E-7	1E-9	4E-5	4E-4
		W, see <sup>102</sup> Ag	-	2E+3	7E-7	2E-9	-	-
		Y, see <sup>102</sup> Ag	-	2E+3	7E-7	2E-9	-	-
47	Silver-106m	D, see <sup>102</sup> Ag	8E+2	7E+2	3E-7	1E-9	1E-5	1E-4
		W, see <sup>102</sup> Ag	-	9E+2	4E-7	1E-9	-	-
		Y, see <sup>102</sup> Ag	-	9E+2	4E-7	1E-9	-	-
47	Silver-106 <sup>2</sup>	D, see <sup>102</sup> Ag	6E+4	2E+5	8E-5	3E-7	-	-
		St. wall (6E+4)	-	-	-	-	9E-4	9E-3
		W, see <sup>102</sup> Ag	-	2E+5	9E-5	3E-7	-	-
47	Silver-108m	D, see <sup>102</sup> Ag	6E+2	2E+2	8E-8	3E-10	9E-6	9E-5
		W, see <sup>102</sup> Ag	-	3E+2	1E-7	4E-10	-	-
		Y, see <sup>102</sup> Ag	-	2E+1	1E-8	3E-11	-	-
47	Silver-110m	D, see <sup>102</sup> Ag	5E+2	1E+2	5E-8	2E-10	6E-6	6E-5
		W, see <sup>102</sup> Ag	-	2E+2	8E-8	3E-10	-	-
		Y, see <sup>102</sup> Ag	-	9E+1	4E-8	1E-10	-	-
47	Silver-111	D, see <sup>102</sup> Ag	9E+2	2E+3	6E-7	-	-	-
		LLI wall (1E+3)	-	Liver (2E+3)	-	2E-9	2E-5	2E-4
		W, see <sup>102</sup> Ag	-	9E+2	4E-7	1E-9	-	-
47	Silver-112	D, see <sup>102</sup> Ag	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
		W, see <sup>102</sup> Ag	-	1E+4	4E-6	1E-8	-	-
		Y, see <sup>102</sup> Ag	-	9E+3	4E-6	1E-8	-	-
47	Silver-115 <sup>2</sup>	D, see <sup>102</sup> Ag	3E+4	9E+4	4E-5	1E-7	-	-
		St wall (3E+4)	-	-	-	-	4E-4	4E-3
		W, see <sup>102</sup> Ag	-	9E+4	4E-5	1E-7	-	-
48	Cadmium-104 <sup>2</sup>	D, all compounds except those given for W and Y	2E+4	7E+4	3E-5	9E-8	3E-4	3E-3
		W, sulfides, halides, and nitrates	-	1E+5	5E-5	2E-7	-	-
		Y, oxides and hydroxides	-	1E+5	5E-5	2E-7	-	-
48	Cadmium-107	D, see <sup>104</sup> Cd	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3
		W, see <sup>104</sup> Cd	-	6E+4	2E-5	8E-8	-	-
		Y, see <sup>104</sup> Cd	-	5E+4	2E-5	7E-8	-	-
48	Cadmium-109	D, see <sup>104</sup> Cd	3E+2	4E+1	1E-8	-	-	-
		Kidneys (4E+2)	-	Kidneys (5E+1)	-	7E-11	6E-6	6E-5
		W, see <sup>104</sup> Cd	-	1E+2	5E-8	-	-	-
48	Cadmium-113m	D, see <sup>104</sup> Cd	2E+1	2E+0	1E-9	-	-	-
		Kidneys (4E+1)	-	Kidneys (4E+0)	-	5E-12	5E-7	5E-6
		W, see <sup>104</sup> Cd	-	8E+0	4E-9	-	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )	-		-				
			-	Kidneys (1E+1)	-	2E-11	-	-
		Y, see $^{104}\text{Cd}$	-	1E+1	5E-9	2E-11	-	-
48	Cadmium-113	D, see $^{104}\text{Cd}$	2E+1	2E+0	9E-10	-	-	-
			Kidneys (3E+1)	Kidneys (3E+0)	-	5E-12	4E-7	4E-6
		W, see $^{104}\text{Cd}$	-	8E+0	3E-9	-	-	-
			-	Kidneys (1E+1)	-	2E-11	-	-
		Y, see $^{104}\text{Cd}$	-	1E+1	6E-9	2E-11	-	-
48	Cadmium-115m	D, see $^{104}\text{Cd}$	3E+2	5E+1	2E-8	-	4E-6	4E-5
			-	Kidneys (8E+1)	-	1E-10	-	-
		W, see $^{104}\text{Cd}$	-	1E+2	5E-8	2E-10	-	-
		Y, see $^{104}\text{Cd}$	-	1E+2	6E-8	2E-10	-	-
48	Cadmium-115	D, see $^{104}\text{Cd}$	9E+2	1E+3	6E-7	2E-9	-	-
			LLI wall (1E+3)	-	-	-	1E-5	1E-4
		W, see $^{104}\text{Cd}$	-	1E+3	5E-7	2E-9	-	-
		Y, see $^{104}\text{Cd}$	-	1E+3	6E-7	2E-9	-	-
48	Cadmium-117m	D, see $^{104}\text{Cd}$	5E+3	1E+4	5E-6	2E-8	6E-5	6E-4
		W, see $^{104}\text{Cd}$	-	2E+4	7E-6	2E-8	-	-
		Y, see $^{104}\text{Cd}$	-	1E+4	6E-6	2E-8	-	-
48	Cadmium-117	D, see $^{104}\text{Cd}$	5E+3	1E+4	5E-6	2E-8	6E-5	6E-4
		W, see $^{104}\text{Cd}$	-	2E+4	7E-6	2E-8	-	-
		Y, see $^{104}\text{Cd}$	-	1E+4	6E-6	2E-8	-	-
49	Indium-109	D, all compounds except those given for W	2E+4	4E+4	2E-5	6E-8	3E-4	3E-3
		W, oxides, hydroxides, halides, and nitrates	-	6E+4	3E-5	9E-8	-	-
49	Indium-110 <sup>2</sup> (69.1 min)	D, see $^{109}\text{In}$	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{109}\text{In}$	-	6E+4	2E-5	8E-8	-	-
49	Indium-110 (4.9 h)	D, see $^{109}\text{In}$	5E+3	2E+4	7E-6	2E-8	7E-5	7E-4
		W, see $^{109}\text{In}$	-	2E+4	8E-6	3E-8	-	-
49	Indium-111	D, see $^{109}\text{In}$	4E+3	6E+3	3E-6	9E-9	6E-5	6E-4
		W, see $^{109}\text{In}$	-	6E+3	3E-6	9E-9	-	-
49	Indium-112 <sup>2</sup>	D, see $^{109}\text{In}$	2E+5	6E+5	3E-4	9E-7	2E-3	2E-2
		W, see $^{109}\text{In}$	-	7E+5	3E-4	1E-6	-	-
49	Indium-113m <sup>2</sup>	D, see $^{109}\text{In}$	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
		W, see $^{109}\text{In}$	-	2E+5	8E-5	3E-7	-	-
49	Indium-114m	D, see $^{109}\text{In}$	3E+2	6E+1	3E-8	9E-11	-	-
			LLI wall (4E+2)	-	-	-	5E-6	5E-5
		W, see $^{109}\text{In}$	-	1E+2	4E-8	1E-10	-	-
49	Indium-115m	D, see $^{109}\text{In}$	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{109}\text{In}$	-	5E+4	2E-5	7E-8	-	-
49	Indium-115	D, see $^{109}\text{In}$	4E+1	1E+0	6E-10	2E-12	5E-7	5E-6
		W, see $^{109}\text{In}$	-	5E+0	2E-9	8E-12	-	-
49	Indium-116m <sup>2</sup>	D, see $^{109}\text{In}$	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
		W, see $^{109}\text{In}$	-	1E+5	5E-5	2E-7	-	-
49	Indium-117m <sup>2</sup>	D, see $^{109}\text{In}$	1E+4	3E+4	1E-5	5E-8	2E-4	2E-3
		W, see $^{109}\text{In}$	-	4E+4	2E-5	6E-8	-	-
49	Indium-117 <sup>2</sup>	D, see $^{109}\text{In}$	6E+4	2E+5	7E-5	2E-7	8E-4	8E-3
		W, see $^{109}\text{In}$	-	2E+5	9E-5	3E-7	-	-
49	Indium-119m <sup>2</sup>	D, see $^{109}\text{In}$	4E+4	1E+5	5E-5	2E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
	ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )						
			St wall (5E+4)	-	-	-	7E-4	7E-3
		W, see $^{109}\text{In}$	-	1E+5	6E-5	2E-7	-	-
50	Tin-110	D, all compounds except those given for W	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
		W, sulfides, oxides, hydroxides, halides, nitrates, and stannic phosphate	-	1E+4	5E-6	2E-8	-	-
50	Tin-111 <sup>2</sup>	D, see $^{110}\text{Sn}$	7E+4	2E+5	9E-5	3E-7	1E-3	1E-2
		W, see $^{110}\text{Sn}$	-	3E+5	1E-4	4E-7	-	-
50	Tin-113	D, see $^{110}\text{Sn}$	2E+3	1E+3	5E-7	2E-9	-	-
		LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
		W, see $^{110}\text{Sn}$	-	5E+2	2E-7	8E-10	-	-
50	Tin-117m	D, see $^{110}\text{Sn}$	2E+3	1E+3	5E-7	-	-	-
		LLI wall (2E+3)	-	Bone surf (2E+3)	-	3E-9	3E-5	3E-4
		W, see $^{110}\text{Sn}$	-	1E+3	6E-7	2E-9	-	-
50	Tin-119m	D, see $^{110}\text{Sn}$	3E+3	2E+3	1E-6	3E-9	-	-
		LLI wall (4E+3)	-	-	-	-	6E-5	6E-4
		W, see $^{110}\text{Sn}$	-	1E+3	4E-7	1E-9	-	-
50	Tin-121m	D, see $^{110}\text{Sn}$	3E+3	9E+2	4E-7	1E-9	-	-
		LLI wall (4E+3)	-	-	-	-	5E-5	5E-4
		W, see $^{110}\text{Sn}$	-	5E+2	2E-7	8E-10	-	-
50	Tin-121	D, see $^{110}\text{Sn}$	6E+3	2E+4	6E-6	2E-8	-	-
		LLI wall (6E+3)	-	-	-	-	8E-5	8E-4
		W, see $^{110}\text{Sn}$	-	1E+4	5E-6	2E-8	-	-
50	Tin-123m <sup>2</sup>	D, see $^{110}\text{Sn}$	5E+4	1E+5	5E-5	2E-7	7E-4	7E-3
		W, see $^{110}\text{Sn}$	-	1E+5	6E-5	2E-7	-	-
50	Tin-123	D, see $^{110}\text{Sn}$	5E+2	6E+2	3E-7	9E-10	-	-
		LLI wall (6E+2)	-	-	-	-	9E-6	9E-5
		W, see $^{110}\text{Sn}$	-	2E+2	7E-8	2E-10	-	-
50	Tin-125	D, see $^{110}\text{Sn}$	4E+2	9E+2	4E-7	1E-9	-	-
		LLI wall (5E+2)	-	-	-	-	6E-6	6E-5
		W, see $^{110}\text{Sn}$	-	4E+2	1E-7	5E-10	-	-
50	Tin-126	D, see $^{110}\text{Sn}$	3E+2	6E+1	2E-8	8E-11	4E-6	4E-5
		W, see $^{110}\text{Sn}$	-	7E+1	3E-8	9E-11	-	-
50	Tin-127	D, see $^{110}\text{Sn}$	7E+3	2E+4	8E-6	3E-8	9E-5	9E-4
		W, see $^{110}\text{Sn}$	-	2E+4	8E-6	3E-8	-	-
50	Tin-128 <sup>2</sup>	D, see $^{110}\text{Sn}$	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
		W, see $^{110}\text{Sn}$	-	4E+4	1E-5	5E-8	-	-
51	Antimony-115 <sup>2</sup>	D, all compounds except those given for W	8E+4	2E+5	1E-4	3E-7	1E-3	1E-2
		W, oxides, hydroxides, halides, sulfides, sulfates, and nitrates	-	3E+5	1E-4	4E-7	-	-
51	Antimony-116m <sup>2</sup>	D, see $^{115}\text{Sb}$	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
		W, see $^{115}\text{Sb}$	-	1E+5	6E-5	2E-7	-	-
51	Antimony-116 <sup>2</sup>	D, see $^{115}\text{Sb}$	7E+4	3E+5	1E-4	4E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers  Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
				ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )			
			St wall ( $9\text{E}+4$ )	-	-	-	$1\text{E}-3$	$1\text{E}-2$
		W, see $^{115}\text{Sb}$	-	$3\text{E}+5$	$1\text{E}-4$	$5\text{E}-7$	-	-
51	Antimony-117	D, see $^{115}\text{Sb}$	$7\text{E}+4$	$2\text{E}+5$	$9\text{E}-5$	$3\text{E}-7$	$9\text{E}-4$	$9\text{E}-3$
		W, see $^{115}\text{Sb}$	-	$3\text{E}+5$	$1\text{E}-4$	$4\text{E}-7$	-	-
51	Antimony-118m	D, see $^{115}\text{Sb}$	$6\text{E}+3$	$2\text{E}+4$	$8\text{E}-6$	$3\text{E}-8$	$7\text{E}-5$	$7\text{E}-4$
		W, see $^{115}\text{Sb}$	$5\text{E}+3$	$2\text{E}+4$	$9\text{E}-6$	$3\text{E}-8$	-	-
51	Antimony-119	D, see $^{115}\text{Sb}$	$2\text{E}+4$	$5\text{E}+4$	$2\text{E}-5$	$6\text{E}-8$	$2\text{E}-4$	$2\text{E}-3$
		W, see $^{115}\text{Sb}$	$2\text{E}+4$	$3\text{E}+4$	$1\text{E}-5$	$4\text{E}-8$	-	-
51	Antimony-120 <sup>2</sup> (16 min)	D, see $^{115}\text{Sb}$	$1\text{E}+5$	$4\text{E}+5$	$2\text{E}-4$	$6\text{E}-7$	-	-
		St wall ( $2\text{E}+5$ )	-	-	-	-	$2\text{E}-3$	$2\text{E}-2$
		W, see $^{115}\text{Sb}$	-	$5\text{E}+5$	$2\text{E}-4$	$7\text{E}-7$	-	-
51	Antimony-120 (5.76 d)	D, see $^{115}\text{Sb}$	$1\text{E}+3$	$2\text{E}+3$	$9\text{E}-7$	$3\text{E}-9$	$1\text{E}-5$	$1\text{E}-4$
		W, see $^{115}\text{Sb}$	$9\text{E}+2$	$1\text{E}+3$	$5\text{E}-7$	$2\text{E}-9$	-	-
51	Antimony-122	D, see $^{115}\text{Sb}$	$8\text{E}+2$	$2\text{E}+3$	$1\text{E}-6$	$3\text{E}-9$	-	-
		LLI wall ( $8\text{E}+2$ )	-	-	-	-	$1\text{E}-5$	$1\text{E}-4$
		W, see $^{115}\text{Sb}$	$7\text{E}+2$	$1\text{E}+3$	$4\text{E}-7$	$2\text{E}-9$	-	-
51	Antimony- 124m <sup>2</sup>	D, see $^{115}\text{Sb}$	$3\text{E}+5$	$8\text{E}+5$	$4\text{E}-4$	$1\text{E}-6$	$3\text{E}-3$	$3\text{E}-2$
		W, see $^{115}\text{Sb}$	$2\text{E}+5$	$6\text{E}+5$	$2\text{E}-4$	$8\text{E}-7$	-	-
51	Antimony-124	D, see $^{115}\text{Sb}$	$6\text{E}+2$	$9\text{E}+2$	$4\text{E}-7$	$1\text{E}-9$	$7\text{E}-6$	$7\text{E}-5$
		W, see $^{115}\text{Sb}$	$5\text{E}+2$	$2\text{E}+2$	$1\text{E}-7$	$3\text{E}-10$	-	-
51	Antimony-125	D, see $^{115}\text{Sb}$	$2\text{E}+3$	$2\text{E}+3$	$1\text{E}-6$	$3\text{E}-9$	$3\text{E}-5$	$3\text{E}-4$
		W, see $^{115}\text{Sb}$	-	$5\text{E}+2$	$2\text{E}-7$	$7\text{E}-10$	-	-
51	Antimony- 126m <sup>2</sup>	D, see $^{115}\text{Sb}$	$5\text{E}+4$	$2\text{E}+5$	$8\text{E}-5$	$3\text{E}-7$	-	-
		St wall ( $7\text{E}+4$ )	-	-	-	-	$9\text{E}-4$	$9\text{E}-3$
		W, see $^{115}\text{Sb}$	-	$2\text{E}+5$	$8\text{E}-5$	$3\text{E}-7$	-	-
51	Antimony-126	D, see $^{115}\text{Sb}$	$6\text{E}+2$	$1\text{E}+3$	$5\text{E}-7$	$2\text{E}-9$	$7\text{E}-6$	$7\text{E}-5$
		W, see $^{115}\text{Sb}$	$5\text{E}+2$	$5\text{E}+2$	$2\text{E}-7$	$7\text{E}-10$	-	-
51	Antimony-127	D, see $^{115}\text{Sb}$	$8\text{E}+2$	$2\text{E}+3$	$9\text{E}-7$	$3\text{E}-9$	-	-
		LLI wall ( $8\text{E}+2$ )	-	-	-	-	$1\text{E}-5$	$1\text{E}-4$
		W, see $^{115}\text{Sb}$	$7\text{E}+2$	$9\text{E}+2$	$4\text{E}-7$	$1\text{E}-9$	-	-
51	Antimony-128 <sup>2</sup> (10.4 min)	D, see $^{115}\text{Sb}$	$8\text{E}+4$	$4\text{E}+5$	$2\text{E}-4$	$5\text{E}-7$	-	-
		St wall ( $1\text{E}+5$ )	-	-	-	-	$1\text{E}-3$	$1\text{E}-2$
		W, see $^{115}\text{Sb}$	-	$4\text{E}+5$	$2\text{E}-4$	$6\text{E}-7$	-	-
51	Antimony-128 (9.01 h)	D, see $^{115}\text{Sb}$	$1\text{E}+3$	$4\text{E}+3$	$2\text{E}-6$	$6\text{E}-9$	$2\text{E}-5$	$2\text{E}-4$
		W, see $^{115}\text{Sb}$	-	$3\text{E}+3$	$1\text{E}-6$	$5\text{E}-9$	-	-
51	Antimony-129	D, see $^{115}\text{Sb}$	$3\text{E}+3$	$9\text{E}+3$	$4\text{E}-6$	$1\text{E}-8$	$4\text{E}-5$	$4\text{E}-4$
		W, see $^{115}\text{Sb}$	-	$9\text{E}+3$	$4\text{E}-6$	$1\text{E}-8$	-	-
51	Antimony-130 <sup>2</sup>	D, see $^{115}\text{Sb}$	$2\text{E}+4$	$6\text{E}+4$	$3\text{E}-5$	$9\text{E}-8$	$3\text{E}-4$	$3\text{E}-3$
		W, see $^{115}\text{Sb}$	-	$8\text{E}+4$	$3\text{E}-5$	$1\text{E}-7$	-	-
51	Antimony-131 <sup>2</sup>	D, see $^{115}\text{Sb}$	$1\text{E}+4$	$2\text{E}+4$	$1\text{E}-5$	-	-	-
		Thyroid ( $2\text{E}+4$ )	-	Thyroid ( $4\text{E}+4$ )	-	$6\text{E}-8$	$2\text{E}-4$	$2\text{E}-3$
		W, see $^{115}\text{Sb}$	-	$2\text{E}+4$	$1\text{E}-5$	-	-	-
			-	Thyroid ( $4\text{E}+4$ )	-	$6\text{E}-8$	-	-
52	Tellurium-116	D, all compounds except those given for W	$8\text{E}+3$	$2\text{E}+4$	$9\text{E}-6$	$3\text{E}-8$	$1\text{E}-4$	$1\text{E}-3$
		W, oxides, hydroxides, and nitrates	-	$3\text{E}+4$	$1\text{E}-5$	$4\text{E}-8$	-	-
52	Tellurium-121m	D, see $^{116}\text{Te}$	$5\text{E}+2$	$2\text{E}+2$	$8\text{E}-8$	-	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
				ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )			
Bone surf ( $7\text{E}+2$ )	Bone surf ( $4\text{E}+2$ )	-	5E-10	1E-5	1E-4			
52	Tellurium-121	W, see $^{116}\text{Te}$	-	4E+2	2E-7	6E-10	-	-
		D, see $^{116}\text{Te}$	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
		W, see $^{116}\text{Te}$	-	3E+3	1E-6	4E-9	-	-
52	Tellurium-123m	D, see $^{116}\text{Te}$	6E+2	2E+2	9E-8	-	-	-
		Bone surf (1E+3)	Bone surf (5E+2)	-	8E-10	1E-5	1E-4	
		W, see $^{116}\text{Te}$	-	5E+2	2E-7	8E-10	-	-
52	Tellurium-123	D, see $^{116}\text{Te}$	5E+2	2E+2	8E-8	-	-	-
		Bone surf (1E+3)	Bone surf (5E+2)	-	7E-10	2E-5	2E-4	
		W, see $^{116}\text{Te}$	-	4E+2	2E-7	-	-	-
		-	Bone surf (1E+3)	-	2E-9	-	-	
52	Tellurium-125m	D, see $^{116}\text{Te}$	1E+3	4E+2	2E-7	-	-	-
		Bone surf (1E+3)	Bone surf (1E+3)	-	1E-9	2E-5	2E-4	
		W, see $^{116}\text{Te}$	-	7E+2	3E-7	1E-9	-	-
52	Tellurium-127m	D, see $^{116}\text{Te}$	6E+2	3E+2	1E-7	-	9E-6	9E-5
		-	Bone surf (4E+2)	-	6E-10	-	-	
		W, see $^{116}\text{Te}$	-	3E+2	1E-7	4E-10	-	-
52	Tellurium-127	D, see $^{116}\text{Te}$	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
		W, see $^{116}\text{Te}$	-	2E+4	7E-6	2E-8	-	-
52	Tellurium-129m	D, see $^{116}\text{Te}$	5E+2	6E+2	3E-7	9E-10	7E-6	7E-5
		W, see $^{116}\text{Te}$	-	2E+2	1E-7	3E-10	-	-
52	Tellurium-129 <sup>2</sup>	D, see $^{116}\text{Te}$	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
		W, see $^{116}\text{Te}$	-	7E+4	3E-5	1E-7	-	-
52	Tellurium-131m	D, see $^{116}\text{Te}$	3E+2	4E+2	2E-7	-	-	-
		Thyroid (6E+2)	Thyroid (1E+3)	-	2E-9	8E-6	8E-5	
		W, see $^{116}\text{Te}$	-	4E+2	2E-7	-	-	-
52	Tellurium-131 <sup>2</sup>	D, see $^{116}\text{Te}$	3E+3	5E+3	2E-6	-	-	-
		Thyroid (6E+3)	Thyroid (1E+4)	-	2E-8	8E-5	8E-4	
		W, see $^{116}\text{Te}$	-	5E+3	2E-6	-	-	-
		-	Thyroid (1E+4)	-	2E-8	-	-	
52	Tellurium-132	D, see $^{116}\text{Te}$	2E+2	2E+2	9E-8	-	-	-
		Thyroid (7E+2)	Thyroid (8E+2)	-	1E-9	9E-6	9E-5	
		W, see $^{116}\text{Te}$	-	2E+2	9E-8	-	-	-
		-	Thyroid (6E+2)	-	9E-10	-	-	
52	Tellurium-133m <sup>2</sup>	D, see $^{116}\text{Te}$	3E+3	5E+3	2E-6	-	-	-
		Thyroid (6E+3)	Thyroid (1E+4)	-	2E-8	9E-5	9E-4	
		W, see $^{116}\text{Te}$	-	5E+3	2E-6	-	-	-
52	Tellurium-133 <sup>2</sup>	D, see $^{116}\text{Te}$	1E+4	2E+4	9E-6	-	-	-
		Thyroid (3E+4)	Thyroid (6E+4)	-	8E-8	4E-4	4E-3	
		W, see $^{116}\text{Te}$	-	2E+4	9E-6	-	-	-
		-	Thyroid (6E+4)	-	8E-8	-	-	
52	Tellurium-134 <sup>2</sup>	D, see $^{116}\text{Te}$	2E+4	2E+4	1E-5	-	-	-
		Thyroid (2E+4)	Thyroid (5E+4)	-	7E-8	3E-4	3E-3	

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		W, see $^{116}\text{Te}$	-	2E+4	1E-5	-	-	-
			-	Thyroid (5E+4)	-	7E-8	-	-
53	Iodine-120m <sup>2</sup>	D, all compounds	1E+4	2E+4	9E-6	3E-8	-	-
			Thyroid (1E+4)	-	-	-	2E-4	2E-3
53	Iodine-120 <sup>2</sup>	D, all compounds	4E+3	9E+3	4E-6	-	-	-
			Thyroid (8E+3)	Thyroid (1E+4)	-	2E-8	1E-4	1E-3
53	Iodine-121	D, all compounds	1E+4	2E+4	8E-6	-	-	-
			Thyroid (3E+4)	Thyroid (5E+4)	-	7E-8	4E-4	4E-3
53	Iodine-123	D, all compounds	3E+3	6E+3	3E-6	-	-	-
			Thyroid (1E+4)	Thyroid (2E+4)	-	2E-8	1E-4	1E-3
53	Iodine-124	D, all compounds	5E+1	8E+1	3E-8	-	-	-
			Thyroid (2E+2)	Thyroid (3E+2)	-	4E-10	2E-6	2E-5
53	Iodine-125	D, all compounds	4E+1	6E+1	3E-8	-	-	-
			Thyroid (1E+2)	Thyroid (2E+2)	-	3E-10	2E-6	2E-5
53	Iodine-126	D, all compounds	2E+1	4E+1	1E-8	-	-	-
			Thyroid (7E+1)	Thyroid (1E+2)	-	2E-10	1E-6	1E-5
53	Iodine-128 <sup>2</sup>	D, all compounds	4E+4	1E+5	5E-5	2E-7	-	-
			St wall (6E+4)	-	-	-	8E-4	8E-3
53	Iodine-129	D, all compounds	5E+0	9E+0	4E-9	-	-	-
			Thyroid (2E+1)	Thyroid (3E+1)	-	4E-11	2E-7	2E-6
53	Iodine-130	D, all compounds	4E+2	7E+2	3E-7	-	-	-
			Thyroid (1E+3)	Thyroid (2E+3)	-	3E-9	2E-5	2E-4
53	Iodine-131	D, all compounds	3E+1	5E+1	2E-8	-	-	-
			Thyroid (9E+1)	Thyroid (2E+2)	-	2E-10	1E-6	1E-5
53	Iodine-132m <sup>2</sup>	D, all compounds	4E+3	8E+3	4E-6	-	-	-
			Thyroid (1E+4)	Thyroid (2E+4)	-	3E-8	1E-4	1E-3
53	Iodine-132	D, all compounds	4E+3	8E+3	3E-6	-	-	-
			Thyroid (9E+3)	Thyroid (1E+4)	-	2E-8	1E-4	1E-3
53	Iodine-133	D, all compounds	1E+2	3E+2	1E-7	-	-	-
			Thyroid (5E+2)	Thyroid (9E+2)	-	1E-9	7E-6	7E-5
53	Iodine-134 <sup>2</sup>	D, all compounds	2E+4	5E+4	2E-5	6E-8	-	-
			Thyroid (3E+4)	-	-	-	4E-4	4E-3
53	Iodine-135	D, all compounds	8E+2	2E+3	7E-7	-	-	-
			Thyroid (3E+3)	Thyroid (4E+3)	-	6E-9	3E-5	3E-4
54	Xenon-120 <sup>2</sup>	Submersion <sup>1</sup>	-	-	1E-5	4E-8	-	-
54	Xenon-121 <sup>2</sup>	Submersion <sup>1</sup>	-	-	2E-6	1E-8	-	-
54	Xenon-122	Submersion <sup>1</sup>	-	-	7E-5	3E-7	-	-
54	Xenon-123	Submersion <sup>1</sup>	-	-	6E-6	3E-8	-	-
54	Xenon-125	Submersion <sup>1</sup>	-	-	2E-5	7E-8	-	-
54	Xenon-127	Submersion <sup>1</sup>	-	-	1E-5	6E-8	-	-
54	Xenon-129m	Submersion <sup>1</sup>	-	-	2E-4	9E-7	-	-
54	Xenon-131m	Submersion <sup>1</sup>	-	-	4E-4	2E-6	-	-
54	Xenon-133m	Submersion <sup>1</sup>	-	-	1E-4	6E-7	-	-
54	Xenon-133	Submersion <sup>1</sup>	-	-	1E-4	5E-7	-	-
54	Xenon-135m <sup>2</sup>	Submersion <sup>1</sup>	-	-	9E-6	4E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
54	Xenon-135	Submersion <sup>1</sup>	-	-	1E-5	7E-8	-	-
54	Xenon-138 <sup>2</sup>	Submersion <sup>1</sup>	-	-	4E-6	2E-8	-	-
55	Cesium-125 <sup>2</sup>	D, all compounds	5E+4	1E+5	6E-5	2E-7	-	-
			St wall (9E+4)	-	-	-	1E-3	1E-2
55	Cesium-127	D, all compounds	6E+4	9E+4	4E-5	1E-7	9E-4	9E-3
55	Cesium-129	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
55	Cesium-130 <sup>2</sup>	D, all compounds	6E+4	2E+5	8E-5	3E-7	-	-
			St wall (1E+5)	-	-	-	1E-3	1E-2
55	Cesium-131	D, all compounds	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
55	Cesium-132	D, all compounds	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
55	Cesium-134m	D, all compounds	1E+5	1E+5	6E-5	2E-7	-	-
			St wall (1E+5)	-	-	-	2E-3	2E-2
55	Cesium-134	D, all compounds	7E+1	1E+2	4E-8	2E-10	9E-7	9E-6
55	Cesium-135m <sup>2</sup>	D, all compounds	1E+5	2E+5	8E-5	3E-7	1E-3	1E-2
55	Cesium-135	D, all compounds	7E+2	1E+3	5E-7	2E-9	1E-5	1E-4
55	Cesium-136	D, all compounds	4E+2	7E+2	3E-7	9E-10	6E-6	6E-5
55	Cesium-137	D, all compounds	1E+2	2E+2	6E-8	2E-10	1E-6	1E-5
55	Cesium-138 <sup>2</sup>	D, all compounds	2E+4	6E+4	2E-5	8E-8	-	-
			St wall (3E+4)	-	-	-	4E-4	4E-3
56	Barium-126 <sup>2</sup>	D, all compounds	6E+3	2E+4	6E-6	2E-8	8E-5	8E-4
56	Barium-128	D, all compounds	5E+2	2E+3	7E-7	2E-9	7E-6	7E-5
56	Barium-131m <sup>2</sup>	D, all compounds	4E+5	1E+6	6E-4	2E-6	-	-
			St wall (5E+5)	-	-	-	7E-3	7E-2
56	Barium-131	D, all compounds	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
56	Barium-133m	D, all compounds	2E+3	9E+3	4E-6	1E-8	-	-
			LLI wall (3E+3)	-	-	-	4E-5	4E-4
56	Barium-133	D, all compounds	2E+3	7E+2	3E-7	9E-10	2E-5	2E-4
56	Barium-135m	D, all compounds	3E+3	1E+4	5E-6	2E-8	4E-5	4E-4
56	Barium-139 <sup>2</sup>	D, all compounds	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
56	Barium-140	D, all compounds	5E+2	1E+3	6E-7	2E-9	-	-
			LLI wall (6E+2)	-	-	-	8E-6	8E-5
56	Barium-141 <sup>2</sup>	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
56	Barium-142 <sup>2</sup>	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
57	Lanthanum-131 <sup>2</sup>	D, all compounds except those given for W	5E+4	1E+5	5E-5	2E-7	6E-4	6E-3
			W, oxides and hydroxides	-	2E+5	7E-5	2E-7	-
57	Lanthanum-132	D, see <sup>131</sup> La	3E+3	1E+4	4E-6	1E-8	4E-5	4E-4
			W, see <sup>131</sup> La	-	1E+4	5E-6	2E-8	-
57	Lanthanum-135	D, see <sup>131</sup> La	4E+4	1E+5	4E-5	1E-7	5E-4	5E-3
			W, see <sup>131</sup> La	-	9E+4	4E-5	1E-7	-
57	Lanthanum-137	D, see <sup>131</sup> La	1E+4	6E+1	3E-8	-	2E-4	2E-3
			-	Liver (7E+1)	-	1E-10	-	-
			W, see <sup>131</sup> La	-	3E+2	1E-7	-	-
57	Lanthanum-138	D, see <sup>131</sup> La	9E+2	4E+0	1E-9	5E-12	1E-5	1E-4
			W, see <sup>131</sup> La	-	1E+1	6E-9	2E-11	-
57	Lanthanum-140	D, see <sup>131</sup> La	6E+2	1E+3	6E-7	2E-9	9E-6	9E-5
			W, see <sup>131</sup> La	-	1E+3	5E-7	2E-9	-
57	Lanthanum-141	D, see <sup>131</sup> La	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
			W, see <sup>131</sup> La	-	1E+4	5E-6	2E-8	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers  Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
57	Lanthanum-142 <sup>2</sup>	D, see <sup>131</sup> La	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
		W, see <sup>131</sup> La	-	3E+4	1E-5	5E-8	-	-
57	Lanthanum-143 <sup>2</sup>	D, see <sup>131</sup> La	4E+4	1E+5	4E-5	1E-7	-	-
		St wall (4E+4)	-	-	-	-	5E-4	5E-3
		W, see <sup>131</sup> La	-	9E+4	4E-5	1E-7	-	-
58	Cerium-134	W, all compounds except those given for Y	5E+2	7E+2	3E-7	1E-9	-	-
		LLI wall (6E+2)	-	-	-	-	8E-6	8E-5
		Y, oxides, hydroxides, and fluorides	-	7E+2	3E-7	9E-10	-	-
58	Cerium-135	W, see <sup>134</sup> Ce	2E+3	4E+3	2E-6	5E-9	2E-5	2E-4
		Y, see <sup>134</sup> Ce	-	4E+3	1E-6	5E-9	-	-
58	Cerium-137m	W, see <sup>134</sup> Ce	2E+3	4E+3	2E-6	6E-9	-	-
		LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
		Y, see <sup>134</sup> Ce	-	4E+3	2E-6	5E-9	-	-
58	Cerium-137	W, see <sup>134</sup> Ce	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
		Y, see <sup>134</sup> Ce	-	1E+5	5E-5	2E-7	-	-
58	Cerium-139	W, see <sup>134</sup> Ce	5E+3	8E+2	3E-7	1E-9	7E-5	7E-4
		Y, see <sup>134</sup> Ce	-	7E+2	3E-7	9E-10	-	-
58	Cerium-141	W, see <sup>134</sup> Ce	2E+3	7E+2	3E-7	1E-9	-	-
		LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
		Y, see <sup>134</sup> Ce	-	6E+2	2E-7	8E-10	-	-
58	Cerium-143	W, see <sup>134</sup> Ce	1E+3	2E+3	8E-7	3E-9	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see <sup>134</sup> Ce	-	2E+3	7E-7	2E-9	-	-
58	Cerium-144	W, see <sup>134</sup> Ce	2E+2	3E+1	1E-8	4E-11	-	-
		LLI wall (3E+2)	-	-	-	-	3E-6	3E-5
		Y, see <sup>134</sup> Ce	-	1E+1	6E-9	2E-11	-	-
59	Praseodymium-136 <sup>2</sup>	W, all compounds except those given for Y	5E+4	2E+5	1E-4	3E-7	-	-
		St wall (7E+4)	-	-	-	-	1E-3	1E-2
	Y, oxides, hydroxides, carbides, and fluorides	-	2E+5	9E-5	3E-7	-	-	
59	Praseodymium-137 <sup>2</sup>	W, see <sup>136</sup> Pr	4E+4	2E+5	6E-5	2E-7	5E-4	5E-3
		Y, see <sup>136</sup> Pr	-	1E+5	6E-5	2E-7	-	-
59	Praseodymium-138m	W, see <sup>136</sup> Pr	1E+4	5E+4	2E-5	8E-8	1E-4	1E-3
		Y, see <sup>136</sup> Pr	-	4E+4	2E-5	6E-8	-	-
59	Praseodymium-139	W, see <sup>136</sup> Pr	4E+4	1E+5	5E-5	2E-7	6E-4	6E-3
		Y, see <sup>136</sup> Pr	-	1E+5	5E-5	2E-7	-	-
59	Praseodymium-142m <sup>2</sup>	W, see <sup>136</sup> Pr	8E+4	2E+5	7E-5	2E-7	1E-3	1E-2
		Y, see <sup>136</sup> Pr	-	1E+5	6E-5	2E-7	-	-
59	Praseodymium-142	W, see <sup>136</sup> Pr	1E+3	2E+3	9E-7	3E-9	1E-5	1E-4
		Y, see <sup>136</sup> Pr	-	2E+3	8E-7	3E-9	-	-
59	Praseodymium-143	W, see <sup>136</sup> Pr	9E+2	8E+2	3E-7	1E-9	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see <sup>136</sup> Pr	-	7E+2	3E-7	9E-10	-	-
59	Praseodymium-144 <sup>2</sup>	W, see <sup>136</sup> Pr	3E+4	1E+5	5E-5	2E-7	-	-
		St wall (4E+4)	-	-	-	-	6E-4	6E-3
	Y, see <sup>136</sup> Pr	-	1E+5	5E-5	2E-7	-	-	
59	Praseodymium-	W, see <sup>136</sup> Pr	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
	145	Y, see $^{136}\text{Pr}$	-	8E+3	3E-6	1E-8	-	-
59	Praseodymium-147 <sup>2</sup>	W, see $^{136}\text{Pr}$	5E+4	2E+5	8E-5	3E-7	-	-
		St wall (8E+4)	-	-	-	-	1E-3	1E-2
		Y, see $^{136}\text{Pr}$	-	2E+5	8E-5	3E-7	-	-
60	Neodymium-136 <sup>2</sup>	W, all compounds except those given for Y	1E+4	6E+4	2E-5	8E-8	2E-4	2E-3
		Y, oxides, hydroxides, carbides, and fluorides	-	5E+4	2E-5	8E-8	-	-
60	Neodymium-138	W, see $^{136}\text{Nd}$	2E+3	6E+3	3E-6	9E-9	3E-5	3E-4
		Y, see $^{136}\text{Nd}$	-	5E+3	2E-6	7E-9	-	-
60	Neodymium-139m	W, see $^{136}\text{Nd}$	5E+3	2E+4	7E-6	2E-8	7E-5	7E-4
		Y, see $^{136}\text{Nd}$	-	1E+4	6E-6	2E-8	-	-
60	Neodymium-139 <sup>2</sup>	W, see $^{136}\text{Nd}$	9E+4	3E+5	1E-4	5E-7	1E-3	1E-2
		Y, see $^{136}\text{Nd}$	-	3E+5	1E-4	4E-7	-	-
60	Neodymium-141	W, see $^{136}\text{Nd}$	2E+5	7E+5	3E-4	1E-6	2E-3	2E-2
		Y, see $^{136}\text{Nd}$	-	6E+5	3E-4	9E-7	-	-
60	Neodymium-147	W, see $^{136}\text{Nd}$	1E+3	9E+2	4E-7	1E-9	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see $^{136}\text{Nd}$	-	8E+2	4E-7	1E-9	-	-
60	Neodymium-149 <sup>2</sup>	W, see $^{136}\text{Nd}$	1E+4	3E+4	1E-5	4E-8	1E-4	1E-3
		Y, see $^{136}\text{Nd}$	-	2E+4	1E-5	3E-8	-	-
60	Neodymium-151 <sup>2</sup>	W, see $^{136}\text{Nd}$	7E+4	2E+5	8E-5	3E-7	9E-4	9E-3
		Y, see $^{136}\text{Nd}$	-	2E+5	8E-5	3E-7	-	-
61	Promethium-141 <sup>2</sup>	W, all compounds except those given for Y	5E+4	2E+5	8E-5	3E-7	-	-
		St wall (6E+4)	-	-	-	-	8E-4	8E-3
		Y, oxides, hydroxides, carbides, and fluorides	-	2E+5	7E-5	2E-7	-	-
61	Promethium-143	W, see $^{141}\text{Pm}$	5E+3	6E+2	2E-7	8E-10	7E-5	7E-4
		Y, see $^{141}\text{Pm}$	-	7E+2	3E-7	1E-9	-	-
61	Promethium-144	W, see $^{141}\text{Pm}$	1E+3	1E+2	5E-8	2E-10	2E-5	2E-4
		Y, see $^{141}\text{Pm}$	-	1E+2	5E-8	2E-10	-	-
61	Promethium-145	W, see $^{141}\text{Pm}$	1E+4	2E+2	7E-8	-	1E-4	1E-3
		Bone surf (2E+2)	-	-	-	3E-10	-	-
		Y, see $^{141}\text{Pm}$	-	2E+2	8E-8	3E-10	-	-
61	Promethium-146	W, see $^{141}\text{Pm}$	2E+3	5E+1	2E-8	7E-11	2E-5	2E-4
		Y, see $^{141}\text{Pm}$	-	4E+1	2E-8	6E-11	-	-
61	Promethium-147	W, see $^{141}\text{Pm}$	4E+3	1E+2	5E-8	-	-	-
		LLI wall (5E+3)	-	Bone surf (2E+2)	-	3E-10	7E-5	7E-4
		Y, see $^{141}\text{Pm}$	-	1E+2	6E-8	2E-10	-	-
61	Promethium-148m	W, see $^{141}\text{Pm}$	7E+2	3E+2	1E-7	4E-10	1E-5	1E-4
		Y, see $^{141}\text{Pm}$	-	3E+2	1E-7	5E-10	-	-
61	Promethium-148	W, see $^{141}\text{Pm}$	4E+2	5E+2	2E-7	8E-10	-	-
		LLI wall (5E+2)	-	-	-	-	7E-6	7E-5
		Y, see $^{141}\text{Pm}$	-	5E+2	2E-7	7E-10	-	-
61	Promethium-	W, see $^{141}\text{Pm}$	1E+3	2E+3	8E-7	3E-9	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )	LLI wall ( $1\text{E}+3$ )		-	-			
	149							2E-4
		Y, see $^{141}\text{Pm}$	-	2E+3	8E-7	2E-9	-	-
61	Promethium-150	W, see $^{141}\text{Pm}$	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
		Y, see $^{141}\text{Pm}$	-	2E+4	7E-6	2E-8	-	-
61	Promethium-151	W, see $^{141}\text{Pm}$	2E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		Y, see $^{141}\text{Pm}$	-	3E+3	1E-6	4E-9	-	-
62	Samarium-141m <sup>2</sup>	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
62	Samarium-141 <sup>2</sup>	W, all compounds	5E+4	2E+5	8E-5	2E-7	-	-
		St wall (6E+4)	-	-	-	-	8E-4	8E-3
62	Samarium-142 <sup>2</sup>	W, all compounds	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
62	Samarium-145	W, all compounds	6E+3	5E+2	2E-7	7E-10	8E-5	8E-4
62	Samarium-146	W, all compounds	1E+1	4E+2	1E-11	-	-	-
		Bone surf (3E+1)	Bone surf (6E-2)	-	9E-14	3E-7	3E-6	
62	Samarium-147	W, all compounds	2E+1	4E-2	2E-11	-	-	-
		Bone surf (3E+1)	Bone surf (7E-2)	-	1E-13	4E-7	4E-6	
62	Samarium-151	W, all compounds	1E+4	1E+2	4E-8	-	-	-
		LLI wall (1E+4)	Bone surf (2E+2)	-	2E-10	2E-4	2E-3	
62	Samarium-153	W, all compounds	2E+3	3E+3	1E-6	4E-9	-	-
		LLI wall (2E+3)	-	-	-	3E-5	3E-4	
62	Samarium-155 <sup>2</sup>	W, all compounds	6E+4	2E+5	9E-5	3E-7	-	-
		St wall (8E+4)	-	-	-	1E-3	1E-2	
62	Samarium-156	W, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
63	Europium-145	W, all compounds	2E+3	2E+3	8E-7	3E-9	2E-5	2E-4
63	Europium-146	W, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
63	Europium-147	W, all compounds	3E+3	2E+3	7E-7	2E-9	4E-5	4E-4
63	Europium-148	W, all compounds	1E+3	4E+2	1E-7	5E-10	1E-5	1E-4
63	Europium-149	W, all compounds	1E+4	3E+3	1E-6	4E-9	2E-4	2E-3
63	Europium-150 (12.62 h)	W, all compounds	3E+3	8E+3	4E-6	1E-8	4E-5	4E-4
63	Europium-150 (34.2 y)	W, all compounds	8E+2	2E+1	8E-9	3E-11	1E-5	1E-4
63	Europium-152m	W, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
63	Europium-152	W, all compounds	8E+2	2E+1	1E-8	3E-11	1E-5	1E-4
63	Europium-154	W, all compounds	5E+2	2E+1	8E-9	3E-11	7E-6	7E-5
63	Europium-155	W, all compounds	4E+3	9E+1	4E-8	-	5E-5	5E-4
		-	Bone surf (1E+2)	-	2E-10	-	-	
63	Europium-156	W, all compounds	6E+2	5E+2	2E-7	6E-10	8E-6	8E-5
63	Europium-157	W, all compounds	2E+3	5E+3	2E-6	7E-9	3E-5	3E-4
63	Europium-158 <sup>2</sup>	W, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
64	Gadolinium-145 <sup>2</sup>	D, all compounds except those given for W	5E+4	2E+5	6E-5	2E-7	-	-
		St wall (5E+4)	-	-	-	-	6E-4	6E-3
		W, oxides, hydroxides, and fluorides	-	2E+5	7E-5	2E-7	-	-
64	Gadolinium-146	D, see $^{145}\text{Gd}$	1E+3	1E+2	5E-8	2E-10	2E-5	2E-4
		W, see $^{145}\text{Gd}$	-	3E+2	1E-7	4E-10	-	-
64	Gadolinium-147	D, see $^{145}\text{Gd}$	2E+3	4E+3	2E-6	6E-9	3E-5	3E-4
		W, see $^{145}\text{Gd}$	-	4E+3	1E-6	5E-9	-	-
64	Gadolinium-148	D, see $^{145}\text{Gd}$	1E+1	8E-3	3E-12	-	-	-
		Bone surf (2E+1)	Bone surf (2E+2)	-	2E-14	3E-7	3E-6	

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		W, see $^{145}\text{Gd}$	-	3E-2	1E-11	-	-	-
			-	Bone surf (6E-2)	-	8E-14	-	-
64	Gadolinium-149	D, see $^{145}\text{Gd}$	3E+3	2E+3	9E-7	3E-9	4E-5	4E-4
		W, see $^{145}\text{Gd}$	-	2E+3	1E-6	3E-9	-	-
64	Gadolinium-151	D, see $^{145}\text{Gd}$	6E+3	4E+2	2E-7	-	9E-5	9E-4
			-	Bone surf (6E+2)	-	9E-10	-	-
		W, see $^{145}\text{Gd}$	-	1E+3	5E-7	2E-9	-	-
64	Gadolinium-152	D, see $^{145}\text{Gd}$	2E+1	1E-2	4E-12	-	-	-
			Bone surf (3E+1)	Bone surf (2E-2)	-	3E-14	4E-7	4E-6
		W, see $^{145}\text{Gd}$	-	4E-2	2E-11	-	-	-
			-	Bone surf (8E-2)	-	1E-13	-	-
64	Gadolinium-153	D, see $^{145}\text{Gd}$	5E+3	1E+2	6E-8	-	6E-5	6E-4
			-	Bone surf (2E+2)	-	3E-10	-	-
		W, see $^{145}\text{Gd}$	-	6E+2	2E-7	8E-10	-	-
64	Gadolinium-159	D, see $^{145}\text{Gd}$	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
		W, see $^{145}\text{Gd}$	-	6E+3	2E-6	8E-9	-	-
65	Terbium-147 <sup>2</sup>	W, all compounds	9E+3	3E+4	1E-5	5E-8	1E-4	1E-3
65	Terbium-149	W, all compounds	5E+3	7E+2	3E-7	1E-9	7E-5	7E-4
65	Terbium-150	W, all compounds	5E+3	2E+4	9E-6	3E-8	7E-5	7E-4
65	Terbium-151	W, all compounds	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
65	Terbium-153	W, all compounds	5E+3	7E+3	3E-6	1E-8	7E-5	7E-4
65	Terbium-154	W, all compounds	2E+3	4E+3	2E-6	6E-9	2E-5	2E-4
65	Terbium-155	W, all compounds	6E+3	8E+3	3E-6	1E-8	8E-5	8E-4
65	Terbium-156m (5.0 h)	W, all compounds	2E+4	3E+4	1E-5	4E-8	2E-4	2E-3
65	Terbium-156m (24.4 h)	W, all compounds	7E+3	8E+3	3E-6	1E-8	1E-4	1E-3
65	Terbium-156	W, all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4
65	Terbium-157	W, all compounds	5E+4	3E+2	1E-7	-	-	-
			LLI wall (5E+4)	Bone surf (6E+2)	-	8E-10	7E-4	7E-3
65	Terbium-158	W, all compounds	1E+3	2E+1	8E-9	3E-11	2E-5	2E-4
65	Terbium-160	W, all compounds	8E+2	2E+2	9E-8	3E-10	1E-5	1E-4
65	Terbium-161	W, all compounds	2E+3	2E+3	7E-7	2E-9	-	-
			LLI wall (2E+3)	-	-	-	3E-5	3E-4
66	Dysprosium-155	W, all compounds	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
66	Dysprosium-157	W, all compounds	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
66	Dysprosium-159	W, all compounds	1E+4	2E+3	1E-6	3E-9	2E-4	2E-3
66	Dysprosium-165	W, all compounds	1E+4	5E+4	2E-5	6E-8	2E-4	2E-3
66	Dysprosium-166	W, all compounds	6E+2	7E+2	3E-7	1E-9	-	-
			LLI wall (8E+2)	-	-	-	1E-5	1E-4
67	Holmium-155 <sup>2</sup>	W, all compounds	4E+4	2E+5	6E-5	2E-7	6E-4	6E-3
67	Holmium-157 <sup>2</sup>	W, all compounds	3E+5	1E+6	6E-4	2E-6	4E-3	4E-2
67	Holmium-159 <sup>2</sup>	W, all compounds	2E+5	1E+6	4E-4	1E-6	3E-3	3E-2
67	Holmium-161	W, all compounds	1E+5	4E+5	2E-4	6E-7	1E-3	1E-2
67	Holmium-162m <sup>2</sup>	W, all compounds	5E+4	3E+5	1E-4	4E-7	7E-4	7E-3
67	Holmium-162 <sup>2</sup>	W, all compounds	5E+5	2E+6	1E-3	3E-6	-	-
			St wall (8E+5)	-	-	-	1E-2	1E-1

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
67	Holmium-164 <sup>m2</sup>	W, all compounds	1E+5	3E+5	1E-4	4E-7	1E-3	1E-2
67	Holmium-164 <sup>2</sup>	W, all compounds	2E+5	6E+5	3E-4	9E-7	-	-
			St wall (2E+5)	-	-	-	3E-3	3E-2
67	Holmium-166m	W, all compounds	6E+2	7E+0	3E-9	9E-12	9E-6	9E-5
67	Holmium-166	W, all compounds	9E+2	2E+3	7E-7	2E-9	-	-
			LLI wall (9E+2)	-	-	-	1E-5	1E-4
67	Holmium-167	W, all compounds	2E+4	6E+4	2E-5	8E-8	2E-4	2E-3
68	Erbium-161	W, all compounds	2E+4	6E+4	3E-5	9E-8	2E-4	2E-3
68	Erbium-165	W, all compounds	6E+4	2E+5	8E-5	3E-7	9E-4	9E-3
68	Erbium-169	W, all compounds	3E+3	3E+3	1E-6	4E-9	-	-
			LLI wall (4E+3)	-	-	-	5E-5	5E-4
68	Erbium-171	W, all compounds	4E+3	1E+4	4E-6	1E-8	5E-5	5E-4
68	Erbium-172	W, all compounds	1E+3	1E+3	6E-7	2E-9	-	-
			LLI wall (1E+3)	-	-	-	2E-5	2E-4
69	Thulium-162 <sup>2</sup>	W, all compounds	7E+4	3E+5	1E-4	4E-7	-	-
			St wall (7E+4)	-	-	-	1E-3	1E-2
69	Thulium-166	W, all compounds	4E+3	1E+4	6E-6	2E-8	6E-5	6E-4
69	Thulium-167	W, all compounds	2E+3	2E+3	8E-7	3E-9	-	-
			LLI wall (2E+3)	-	-	-	3E-5	3E-4
69	Thulium-170	W, all compounds	8E+2	2E+2	9E-8	3E-10	-	-
			LLI wall (1E+3)	-	-	-	1E-5	1E-4
69	Thulium-171	W, all compounds	1E+4	3E+2	1E-7	-	-	-
			LLI wall (1E+4)	Bone surf (6E+2)	-	8E-10	2E-4	2E-3
69	Thulium-172	W, all compounds	7E+2	1E+3	5E-7	2E-9	-	-
			LLI wall (8E+2)	-	-	-	1E-5	1E-4
69	Thulium-173	W, all compounds	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
69	Thulium-175 <sup>2</sup>	W, all compounds	7E+4	3E+5	1E-4	4E-7	-	-
			St wall (9E+4)	-	-	-	1E-3	1E-2
70	Ytterbium-162 <sup>2</sup>	W, all compounds except those given for Y	7E+4	3E+5	1E-4	4E-7	1E-3	1E-2
		Y, oxides, hydroxides, and fluorides	-	3E+5	1E-4	4E-7	-	-
70	Ytterbium-166	W, see <sup>162</sup> Yb	1E+3	2E+3	8E-7	3E-9	2E-5	2E-4
		Y, see <sup>162</sup> Yb	-	2E+3	8E-7	3E-9	-	-
70	Ytterbium-167 <sup>2</sup>	W, see <sup>162</sup> Yb	3E+5	8E+5	3E-4	1E-6	4E-3	4E-2
		Y, see <sup>162</sup> Yb	-	7E+5	3E-4	1E-6	-	-
70	Ytterbium-169	W, see <sup>162</sup> Yb	2E+3	8E+2	4E-7	1E-9	2E-5	2E-4
		Y, see <sup>162</sup> Yb	-	7E+2	3E-7	1E-9	-	-
70	Ytterbium-175	W, see <sup>162</sup> Yb	3E+3	4E+3	1E-6	5E-9	-	-
			LLI wall (3E+3)	-	-	-	4E-5	4E-4
		Y, see <sup>162</sup> Yb	-	3E+3	1E-6	5E-9	-	-
70	Ytterbium-177 <sup>2</sup>	W, see <sup>162</sup> Yb	2E+4	5E+4	2E-5	7E-8	2E-4	2E-3
		Y, see <sup>162</sup> Yb	-	5E+4	2E-5	6E-8	-	-
70	Ytterbium-178 <sup>2</sup>	W, see <sup>162</sup> Yb	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		Y, see <sup>162</sup> Yb	-	4E+4	2E-5	5E-8	-	-
71	Lutetium-169	W, all compounds except those given for Y	3E+3	4E+3	2E-6	6E-9	3E-5	3E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		Y, oxides, hydroxides, and fluorides	-	4E+3	2E-6	6E-9	-	-
71	Lutetium-170	W, see $^{169}\text{Lu}$	1E+3	2E+3	9E-7	3E-9	2E-5	2E-4
		Y, see $^{169}\text{Lu}$	-	2E+3	8E-7	3E-9	-	-
71	Lutetium-171	W, see $^{169}\text{Lu}$	2E+3	2E+3	8E-7	3E-9	3E-5	3E-4
		Y, see $^{169}\text{Lu}$	-	2E+3	8E-7	3E-9	-	-
71	Lutetium-172	W, see $^{169}\text{Lu}$	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
		Y, see $^{169}\text{Lu}$	-	1E+3	5E-7	2E-9	-	-
71	Lutetium-173	W, see $^{169}\text{Lu}$	5E+3	3E+2	1E-7	-	7E-5	7E-4
		-	-	Bone surf (5E+2)	-	6E-10	-	-
		Y, see $^{169}\text{Lu}$	-	3E+2	1E-7	4E-10	-	-
71	Lutetium-174m	W, see $^{169}\text{Lu}$	2E+3	2E+2	1E-7	-	-	-
		LLI wall (3E+3)	LLI wall (3E+3)	Bone surf (3E+2)	-	5E-10	4E-5	4E-4
		Y, see $^{169}\text{Lu}$	-	2E+2	9E-8	3E-10	-	-
71	Lutetium-174	W, see $^{169}\text{Lu}$	5E+3	1E+2	5E-8	-	7E-5	7E-4
		-	-	Bone surf (2E+2)	-	3E-10	-	-
		Y, see $^{169}\text{Lu}$	-	2E+2	6E-8	2E-10	-	-
71	Lutetium-176m	W, see $^{169}\text{Lu}$	8E+3	3E+4	1E-5	3E-8	1E-4	1E-3
		Y, see $^{169}\text{Lu}$	-	2E+4	9E-6	3E-8	-	-
71	Lutetium-176	W, see $^{169}\text{Lu}$	7E+2	5E+0	2E-9	-	1E-5	1E-4
		-	-	Bone surf (1E+1)	-	2E-11	-	-
		Y, see $^{169}\text{Lu}$	-	8E+0	3E-9	1E-11	-	-
71	Lutetium-177m	W, see $^{169}\text{Lu}$	7E+2	1E+2	5E-8	-	1E-5	1E-4
		-	-	Bone surf (1E+2)	-	2E-10	-	-
		Y, see $^{169}\text{Lu}$	-	8E+1	3E-8	1E-10	-	-
71	Lutetium-177	W, see $^{169}\text{Lu}$	2E+3	2E+3	9E-7	3E-9	-	-
		LLI wall (3E+3)	LLI wall (3E+3)	-	-	-	4E-5	4E-4
		Y, see $^{169}\text{Lu}$	-	2E+3	9E-7	3E-9	-	-
71	Lutetium-178m <sup>2</sup>	W, see $^{169}\text{Lu}$	5E+4	2E+5	8E-5	3E-7	-	-
		St. wall (6E+4)	St. wall (6E+4)	-	-	-	8E-4	8E-3
		Y, see $^{169}\text{Lu}$	-	2E+5	7E-5	2E-7	-	-
71	Lutetium-178 <sup>2</sup>	W, see $^{169}\text{Lu}$	4E+4	1E+5	5E-5	2E-7	-	-
		St wall (4E+4)	St wall (4E+4)	-	-	-	6E-4	6E-3
		Y, see $^{169}\text{Lu}$	-	1E+5	5E-5	2E-7	-	-
71	Lutetium-179	W, see $^{169}\text{Lu}$	6E+3	2E+4	8E-6	3E-8	9E-5	9E-4
		Y, see $^{169}\text{Lu}$	-	2E+4	6E-6	3E-8	-	-
72	Hafnium-170	D, all compounds except those given for W	3E+3	6E+3	2E-6	8E-9	4E-5	4E-4
		W, oxides, hydroxides, carbides, and nitrates	-	5E+3	2E-6	6E-9	-	-
72	Hafnium-172	D, see $^{170}\text{Hf}$	1E+3	9E+0	4E-9	-	2E-5	2E-4
		-	-	Bone surf (2E+1)	-	3E-11	-	-
		W, see $^{170}\text{Hf}$	-	4E+1	2E-8	-	-	-
		-	-	Bone surf (6E+1)	-	8E-11	-	-
72	Hafnium-173	D, see $^{170}\text{Hf}$	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
		W, see $^{170}\text{Hf}$	-	1E+4	5E-6	2E-8	-	-
72	Hafnium-175	D, see $^{170}\text{Hf}$	3E+3	9E+2	4E-7	-	4E-5	4E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )	Bone surf ( $\mu\text{Ci}/\text{ml}$ )						
			-	Bone surf (1E+3)	-	1E-9	-	-
		W, see $^{170}\text{Hf}$	-	1E+3	5E-7	2E-9	-	-
72	Hafnium-177m <sup>2</sup>	D, see $^{170}\text{Hf}$	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
		W, see $^{170}\text{Hf}$	-	9E+4	4E-5	1E-7	-	-
72	Hafnium-178m	D, see $^{170}\text{Hf}$	3E+2	1E+0	5E-10	-	3E-6	3E-5
			-	Bone surf (2E+0)	-	3E-12	-	-
		W, see $^{170}\text{Hf}$	-	5E+0	2E-9	-	-	-
			-	Bone surf (9E+0)	-	1E-11	-	-
72	Hafnium-179m	D, see $^{170}\text{Hf}$	1E+3	3E+2	1E-7	-	1E-5	1E-4
			-	Bone surf (6E+2)	-	8E-10	-	-
		W, see $^{170}\text{Hf}$	-	6E+2	3E-7	8E-10	-	-
72	Hafnium-180m	D, see $^{170}\text{Hf}$	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
		W, see $^{170}\text{Hf}$	-	3E+4	1E-5	4E-8	-	-
72	Hafnium-181	D, see $^{170}\text{Hf}$	1E+3	2E+2	7E-8	-	2E-5	2E-4
			-	Bone surf (4E+2)	-	6E-10	-	-
		W, see $^{170}\text{Hf}$	-	4E+2	2E-7	6E-10	-	-
72	Hafnium-182m <sup>2</sup>	D, see $^{170}\text{Hf}$	4E+4	9E+4	4E-5	1E-7	5E-4	5E-3
		W, see $^{170}\text{Hf}$	-	1E+5	6E-5	2E-7	-	-
72	Hafnium-182	D, see $^{170}\text{Hf}$	2E+2	8E-1	3E-10	-	-	-
			Bone surf (4E+2)	Bone surf (2E+0)	-	2E-12	5E-6	5E-5
		W, see $^{170}\text{Hf}$	-	3E+0	1E-9	-	-	-
			-	Bone surf (7E+0)	-	1E-11	-	-
72	Hafnium-183 <sup>2</sup>	D, see $^{170}\text{Hf}$	2E+4	5E+4	2E-5	6E-8	3E-4	3E-3
		W, see $^{170}\text{Hf}$	-	6E+4	2E-5	8E-8	-	-
72	Hafnium-184	D, see $^{170}\text{Hf}$	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4
		W, see $^{170}\text{Hf}$	-	6E+3	3E-6	9E-9	-	-
73	Tantalum-172 <sup>2</sup>	W, all compounds except those given for Y	4E+4	1E+5	5E-5	2E-7	5E-4	5E-3
		Y, elemental Ta, oxides, hydroxides, halides, carbides, nitrates, and nitrides	-	1E+5	4E-5	1E-7	-	-
73	Tantalum-173	W, see $^{172}\text{Ta}$	7E+3	2E+4	8E-6	3E-8	9E-5	9E-4
		Y, see $^{172}\text{Ta}$	-	2E+4	7E-6	2E-8	-	-
73	Tantalum-174 <sup>2</sup>	W, see $^{172}\text{Ta}$	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
		Y, see $^{172}\text{Ta}$	-	9E+4	4E-5	1E-7	-	-
73	Tantalum-175	W, see $^{172}\text{Ta}$	6E+3	2E+4	7E-6	2E-8	8E-5	8E-4
		Y, see $^{172}\text{Ta}$	-	1E+4	6E-6	2E-8	-	-
73	Tantalum-176	W, see $^{172}\text{Ta}$	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
		Y, see $^{172}\text{Ta}$	-	1E+4	5E-6	2E-8	-	-
73	Tantalum-177	W, see $^{172}\text{Ta}$	1E+4	2E+4	8E-6	3E-8	2E-4	2E-3
		Y, see $^{172}\text{Ta}$	-	2E+4	7E-6	2E-8	-	-
73	Tantalum-178	W, see $^{172}\text{Ta}$	2E+4	9E+4	4E-5	1E-7	2E-4	2E-3
		Y, see $^{172}\text{Ta}$	-	7E+4	3E-5	1E-7	-	-
73	Tantalum-179	W, see $^{172}\text{Ta}$	2E+4	5E+3	2E-6	8E-9	3E-4	3E-3
		Y, see $^{172}\text{Ta}$	-	9E+2	4E-7	1E-9	-	-
73	Tantalum-180m	W, see $^{172}\text{Ta}$	2E+4	7E+4	3E-5	9E-8	3E-4	3E-3
		Y, see $^{172}\text{Ta}$	-	6E+4	2E-5	8E-8	-	-
73	Tantalum-180	W, see $^{172}\text{Ta}$	1E+3	4E+2	2E-7	6E-10	2E-5	2E-4
		Y, see $^{172}\text{Ta}$	-	2E+1	1E-8	3E-11	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
73	Tantalum-182m <sup>2</sup>	W, see <sup>172</sup> Ta	2E+5	5E+5	2E-4	8E-7	-	-
			St wall (2E+5)	-	-	-	3E-3	3E-2
		Y, see <sup>172</sup> Ta	-	4E+5	2E-4	6E-7	-	-
73	Tantalum-182	W, see <sup>172</sup> Ta	8E+2	3E+2	1E-7	5E-10	1E-5	1E-4
		Y, see <sup>172</sup> Ta	-	1E+2	6E-8	2E-10	-	-
73	Tantalum-183	W, see <sup>172</sup> Ta	9E+2	1E+3	5E-7	2E-9	-	-
		LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
		Y, see <sup>172</sup> Ta	-	1E+3	4E-7	1E-9	-	-
73	Tantalum-184	W, see <sup>172</sup> Ta	2E+3	5E+3	2E-6	8E-9	3E-5	3E-4
		Y, see <sup>172</sup> Ta	-	5E+3	2E-6	7E-9	-	-
73	Tantalum-185 <sup>2</sup>	W, see <sup>172</sup> Ta	3E+4	7E+4	3E-5	1E-7	4E-4	4E-3
		Y, see <sup>172</sup> Ta	-	6E+4	3E-5	9E-8	-	-
73	Tantalum-186 <sup>2</sup>	W, see <sup>172</sup> Ta	5E+4	2E+5	1E-4	3E-7	-	-
		St wall (7E+4)	-	-	-	-	1E-3	1E-2
		Y, see <sup>172</sup> Ta	-	2E+5	9E-5	3E-7	-	-
74	Tungsten-176	D, all compounds	1E+4	5E+4	2E-5	7E-8	1E-4	1E-3
74	Tungsten-177	D, all compounds	2E+4	9E+4	4E-5	1E-7	3E-4	3E-3
74	Tungsten-178	D, all compounds	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
74	Tungsten-179 <sup>2</sup>	D, all compounds	5E+5	2E+6	7E-4	2E-6	7E-3	7E-2
74	Tungsten-181	D, all compounds	2E+4	3E+4	1E-5	5E-8	2E-4	2E-3
74	Tungsten-185	D, all compounds	2E+3	7E+3	3E-6	9E-9	-	-
		LLI wall (3E+3)	-	-	-	-	4E-5	4E-4
74	Tungsten-187	D, all compounds	2E+3	9E+3	4E-6	1E-8	3E-5	3E-4
74	Tungsten-188	D, all compounds	4E+2	1E+3	5E-7	2E-9	-	-
		LLI wall (5E+2)	-	-	-	-	7E-6	7E-5
75	Rhenium-177 <sup>2</sup>	D, all compounds except those given for W	9E+4	3E+5	1E-4	4E-7	-	-
		St wall (1E+5)	-	-	-	-	2E-3	2E-2
		W, oxides, hydroxides, and nitrates	-	4E+5	1E-4	5E-7	-	-
75	Rhenium-178 <sup>2</sup>	D, see <sup>177</sup> Re	7E+4	3E+5	1E-4	4E-7	-	-
		St wall (1E+5)	-	-	-	-	1E-3	1E-2
		W, see <sup>177</sup> Re	-	3E+5	1E-4	4E-7	-	-
75	Rhenium-181	D, see <sup>177</sup> Re	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
		W, see <sup>177</sup> Re	-	9E+3	4E-6	1E-8	-	-
75	Rhenium-182 (12.7 h)	D, see <sup>177</sup> Re	7E+3	1E+4	5E-6	2E-8	9E-5	9E-4
		W, see <sup>177</sup> Re	-	2E+4	6E-6	2E-8	-	-
75	Rhenium-182 (64.0 h)	D, see <sup>177</sup> Re	1E+3	2E+3	1E-6	3E-9	2E-5	2E-4
		W, see <sup>177</sup> Re	-	2E+3	9E-7	3E-9	-	-
75	Rhenium-184m	D, see <sup>177</sup> Re	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
		W, see <sup>177</sup> Re	-	4E+2	2E-7	6E-10	-	-
75	Rhenium-184	D, see <sup>177</sup> Re	2E+3	4E+3	1E-6	5E-9	3E-5	3E-4
		W, see <sup>177</sup> Re	-	1E+3	6E-7	2E-9	-	-
75	Rhenium-186m	D, see <sup>177</sup> Re	1E+3	2E+3	7E-7	-	-	-
		St wall (2E+3)	-	St wall (2E+3)	-	3E-9	2E-5	2E-4
		W, see <sup>177</sup> Re	-	2E+2	6E-8	2E-10	-	-
75	Rhenium-186	D, see <sup>177</sup> Re	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
		W, see <sup>177</sup> Re	-	2E+3	7E-7	2E-9	-	-
75	Rhenium-187	D, see <sup>177</sup> Re	6E+5	8E+5	4E-4	-	8E-3	8E-2
		-	-	St wall (9E+5)	-	1E-6	-	-
		W, see <sup>177</sup> Re	-	1E+5	4E-5	1E-7	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers  Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
75	Rhenium-188m <sup>2</sup>	D, see <sup>177</sup> Re	8E+4	1E+5	6E-5	2E-7	1E-3	1E-2
		W, see <sup>177</sup> Re	-	1E+5	6E-5	2E-7	-	-
75	Rhenium-188	D, see <sup>177</sup> Re	2E+3	3E+3	1E-6	4E-9	2E-5	2E-4
		W, see <sup>177</sup> Re	-	3E+3	1E-6	4E-9	-	-
75	Rhenium-189	D, see <sup>177</sup> Re	3E+3	5E+3	2E-6	7E-9	4E-5	4E-4
		W, see <sup>177</sup> Re	-	4E+3	2E-6	6E-9	-	-
76	Osmium-180 <sup>2</sup>	D, all compounds except those given for W and Y	1E+5	4E+5	2E-4	5E-7	1E-3	1E-2
		W, halides and nitrates	-	5E+5	2E-4	7E-7	-	-
		Y, oxides and hydroxides	-	5E+5	2E-4	6E-7	-	-
76	Osmium-181 <sup>2</sup>	D, see <sup>180</sup> Os	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see <sup>180</sup> Os	-	5E+4	2E-5	6E-8	-	-
		Y, see <sup>180</sup> Os	-	4E+4	2E-5	6E-8	-	-
76	Osmium-182	D, see <sup>180</sup> Os	2E+3	6E+3	2E-6	8E-9	3E-5	3E-4
		W, see <sup>180</sup> Os	-	4E+3	2E-6	6E-9	-	-
		Y, see <sup>180</sup> Os	-	4E+3	2E-6	6E-9	-	-
76	Osmium-185	D, see <sup>180</sup> Os	2E+3	5E+2	2E-7	7E-10	3E-5	3E-4
		W, see <sup>180</sup> Os	-	8E+2	3E-7	1E-9	-	-
		Y, see <sup>180</sup> Os	-	8E+2	3E-7	1E-9	-	-
76	Osmium-189m	D, see <sup>180</sup> Os	8E+4	2E+5	1E-4	3E-7	1E-3	1E-2
		W, see <sup>180</sup> Os	-	2E+5	9E-5	3E-7	-	-
		Y, see <sup>180</sup> Os	-	2E+5	7E-5	2E-7	-	-
76	Osmium-191m	D, see <sup>180</sup> Os	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
		W, see <sup>180</sup> Os	-	2E+4	8E-6	3E-8	-	-
		Y, see <sup>180</sup> Os	-	2E+4	7E-6	2E-8	-	-
76	Osmium-191	D, see <sup>180</sup> Os	2E+3	2E+3	9E-7	3E-9	-	-
		LLI wall (3E+3)	-	-	-	-	3E-5	3E-4
		W, see <sup>180</sup> Os	-	2E+3	7E-7	2E-9	-	-
76	Osmium-193	D, see <sup>180</sup> Os	2E+3	5E+3	2E-6	6E-9	-	-
		LLI wall (2E+3)	-	-	-	-	2E-5	2E-4
		W, see <sup>180</sup> Os	-	3E+3	1E-6	4E-9	-	-
76	Osmium-194	D, see <sup>180</sup> Os	4E+2	4E+1	2E-8	6E-11	-	-
		LLI wall (6E+2)	-	-	-	-	8E-6	8E-5
		W, see <sup>180</sup> Os	-	6E+1	2E-8	8E-11	-	-
77	Iridium-182 <sup>2</sup>	D, all compounds except those given for W and Y	4E+4	1E+5	6E-5	2E-7	-	-
		St wall (4E+4)	-	-	-	-	6E-4	6E-3
		W, halides, nitrates, and metallic iridium	-	2E+5	6E-5	2E-7	-	-
77	Iridium-184	D, see <sup>182</sup> Ir	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
		W, see <sup>182</sup> Ir	-	3E+4	1E-5	5E-8	-	-
		Y, see <sup>182</sup> Ir	-	3E+4	1E-5	4E-8	-	-
77	Iridium-185	D, see <sup>182</sup> Ir	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
		W, see <sup>182</sup> Ir	-	1E+4	5E-6	2E-8	-	-
		Y, see <sup>182</sup> Ir	-	1E+4	4E-6	1E-8	-	-
77	Iridium-186	D, see <sup>182</sup> Ir	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )							
		W, see $^{182}\text{Ir}$	-	6E+3	3E-6	9E-9	-	-
		Y, see $^{182}\text{Ir}$	-	6E+3	2E-6	8E-9	-	-
77	Iridium-187	D, see $^{182}\text{Ir}$	1E+4	3E+4	1E-5	5E-8	1E-4	1E-3
		W, see $^{182}\text{Ir}$	-	3E+4	1E-5	4E-8	-	-
		Y, see $^{182}\text{Ir}$	-	3E+4	1E-5	4E-8	-	-
77	Iridium-188	D, see $^{182}\text{Ir}$	2E+3	5E+3	2E-6	6E-9	3E-5	3E-4
		W, see $^{182}\text{Ir}$	-	4E+3	1E-6	5E-9	-	-
		Y, see $^{182}\text{Ir}$	-	3E+3	1E-6	5E-9	-	-
77	Iridium-189	D, see $^{182}\text{Ir}$	5E+3	5E+3	2E-6	7E-9	-	-
		LLI wall (5E+3)	-	-	-	-	7E-5	7E-4
		W, see $^{182}\text{Ir}$	-	4E+3	2E-6	5E-9	-	-
		Y, see $^{182}\text{Ir}$	-	4E+3	1E-6	5E-9	-	-
77	Iridium-190m <sup>2</sup>	D, see $^{182}\text{Ir}$	2E+5	2E+5	8E-5	3E-7	2E-3	2E-2
		W, see $^{182}\text{Ir}$	-	2E+5	9E-5	3E-7	-	-
		Y, see $^{182}\text{Ir}$	-	2E+5	8E-5	3E-7	-	-
77	Iridium-190	D, see $^{182}\text{Ir}$	1E+3	9E+2	4E-7	1E-9	1E-5	1E-4
		W, see $^{182}\text{Ir}$	-	1E+3	4E-7	1E-9	-	-
		Y, see $^{182}\text{Ir}$	-	9E+2	4E-7	1E-9	-	-
77	Iridium-192m	D, see $^{182}\text{Ir}$	3E+3	9E+1	4E-8	1E-10	4E-5	4E-4
		W, see $^{182}\text{Ir}$	-	2E+2	9E-8	3E-10	-	-
		Y, see $^{182}\text{Ir}$	-	2E+1	6E-9	2E-11	-	-
77	Iridium-192	D, see $^{182}\text{Ir}$	9E+2	3E+2	1E-7	4E-10	1E-5	1E-4
		W, see $^{182}\text{Ir}$	-	4E+2	2E-7	6E-10	-	-
		Y, see $^{182}\text{Ir}$	-	2E+2	9E-8	3E-10	-	-
77	Iridium-194m	D, see $^{182}\text{Ir}$	6E+2	9E+1	4E-8	1E-10	9E-6	9E-5
		W, see $^{182}\text{Ir}$	-	2E+2	7E-8	2E-10	-	-
		Y, see $^{182}\text{Ir}$	-	1E+2	4E-8	1E-10	-	-
77	Iridium-194	D, see $^{182}\text{Ir}$	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
		W, see $^{182}\text{Ir}$	-	2E+3	9E-7	3E-9	-	-
		Y, see $^{182}\text{Ir}$	-	2E+3	8E-7	3E-9	-	-
77	Iridium-195m	D, see $^{182}\text{Ir}$	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
		W, see $^{182}\text{Ir}$	-	3E+4	1E-5	4E-8	-	-
		Y, see $^{182}\text{Ir}$	-	2E+4	9E-6	3E-8	-	-
77	Iridium-195	D, see $^{182}\text{Ir}$	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{182}\text{Ir}$	-	5E+4	2E-5	7E-8	-	-
		Y, see $^{182}\text{Ir}$	-	4E+4	2E-5	6E-8	-	-
78	Platinum-186	D, all compounds	1E+4	4E+4	2E-5	5E-8	2E-4	2E-3
78	Platinum-188	D, all compounds	2E+3	2E+3	7E-7	2E-9	2E-5	2E-4
78	Platinum-189	D, all compounds	1E+4	3E+4	1E-5	4E-8	1E-4	1E-3
78	Platinum-191	D, all compounds	4E+3	8E+3	4E-6	1E-8	5E-5	5E-4
78	Platinum-193m	D, all compounds	3E+3	6E+3	3E-6	8E-9	-	-
		LLI wall (3E+4)	-	-	-	-	4E-5	4E-4
78	Platinum-193	D, all compounds	4E+4	2E+4	1E-5	3E-8	-	-
		LLI wall (5E+4)	-	-	-	-	6E-4	6E-3
78	Platinum-195m	D, all compounds	2E+3	4E+3	2E-6	6E-9	-	-
		LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
78	Platinum-197m <sup>2</sup>	D, all compounds	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
78	Platinum-197	D, all compounds	3E+3	1E+4	4E-6	1E-8	4E-5	4E-4
78	Platinum-199 <sup>2</sup>	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
78	Platinum-200	D, all compounds	1E+3	3E+3	1E-6	5E-9	2E-5	2E-4
79	Gold-193	D, all compounds except those given for W and Y	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		W, halides and nitrates	-	2E+4	9E-6	3E-8	-	-
		Y, oxides and hydroxides	-	2E+4	8E-6	3E-8	-	-
79	Gold-194	D, see $^{193}\text{Au}$	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
		W, see $^{193}\text{Au}$	-	5E+3	2E-6	8E-9	-	-
		Y, see $^{193}\text{Au}$	-	5E+3	2E-6	7E-9	-	-
79	Gold-195	D, see $^{193}\text{Au}$	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
		W, see $^{193}\text{Au}$	-	1E+3	6E-7	2E-9	-	-
		Y, see $^{193}\text{Au}$	-	4E+2	2E-7	6E-10	-	-
79	Gold-198m	D, see $^{193}\text{Au}$	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
		W, see $^{193}\text{Au}$	-	1E+3	5E-7	2E-9	-	-
		Y, see $^{193}\text{Au}$	-	1E+3	5E-7	2E-9	-	-
79	Gold-198	D, see $^{193}\text{Au}$	1E+3	4E+3	2E-6	5E-9	2E-5	2E-4
		W, see $^{193}\text{Au}$	-	2E+3	8E-7	3E-9	-	-
		Y, see $^{193}\text{Au}$	-	2E+3	7E-7	2E-9	-	-
79	Gold-199	D, see $^{193}\text{Au}$	3E+3	9E+3	4E-6	1E-8	-	-
		LLI wall (3E+3)	-	-	-	-	4E-5	4E-4
		W, see $^{193}\text{Au}$	-	4E+3	2E-6	6E-9	-	-
		Y, see $^{193}\text{Au}$	-	4E+3	2E-6	5E-9	-	-
79	Gold-200m	D, see $^{193}\text{Au}$	1E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		W, see $^{193}\text{Au}$	-	3E+3	1E-6	4E-9	-	-
		Y, see $^{193}\text{Au}$	-	2E+4	1E-6	3E-9	-	-
79	Gold-200 <sup>2</sup>	D, see $^{193}\text{Au}$	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
		W, see $^{193}\text{Au}$	-	8E+4	3E-5	1E-7	-	-
		Y, see $^{193}\text{Au}$	-	7E+4	3E-5	1E-7	-	-
79	Gold-201 <sup>2</sup>	D, see $^{193}\text{Au}$	7E+4	2E+5	9E-5	3E-7	-	-
		St wall (9E+4)	-	-	-	-	1E-3	1E-2
		W, see $^{193}\text{Au}$	-	2E+5	1E-4	3E-7	-	-
		Y, see $^{193}\text{Au}$	-	2E+5	9E-5	3E-7	-	-
80	Mercury-193m	Vapor	-	8E+3	4E-6	1E-8	-	-
		Organic D	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
		D, sulfates	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
		W, oxides, hydroxides, halides, nitrates, and sulfides	-	8E+3	3E-6	1E-8	-	-
80	Mercury-193	Vapor	-	3E+4	1E-5	4E-8	-	-
		Organic D	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
		D, see $^{193\text{m}}\text{Hg}$	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{193\text{m}}\text{Hg}$	-	4E+4	2E-5	6E-8	-	-
80	Mercury-194	Vapor	-	3E+1	1E-8	4E-11	-	-
		Organic D	2E+1	3E+1	1E-8	4E-11	2E-7	2E-6
		D, see $^{193\text{m}}\text{Hg}$	8E+2	4E+1	2E-8	6E-11	1E-5	1E-4
		W, see $^{193\text{m}}\text{Hg}$	-	1E+2	5E-8	2E-10	-	-
80	Mercury-195m	Vapor	-	4E+3	2E-6	6E-9	-	-
		Organic D	3E+3	6E+3	3E-6	8E-9	4E-5	4E-4
		D, see $^{193\text{m}}\text{Hg}$	2E+3	5E+3	2E-6	7E-9	3E-5	3E-4
		W, see $^{193\text{m}}\text{Hg}$	-	4E+3	2E-6	5E-9	-	-
80	Mercury-195	Vapor	-	3E+4	1E-5	4E-8	-	-
		Organic D	2E+4	5E+4	2E-5	6E-8	2E-4	2E-3
		D, see $^{193\text{m}}\text{Hg}$	1E+4	4E+4	1E-5	5E-8	2E-4	2E-3
		W, see $^{193\text{m}}\text{Hg}$	-	3E+4	1E-5	5E-8	-	-
80	Mercury-197m	Vapor	-	5E+3	2E-6	7E-9	-	-
		Organic D	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
		D, see $^{193\text{m}}\text{Hg}$	3E+3	7E+3	3E-6	1E-8	4E-5	4E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		W, see $^{195\text{m}}\text{Hg}$	-	5E+3	2E-6	7E-9	-	-
80	Mercury-197	Vapor	-	8E+3	4E-6	1E-8	-	-
		Organic D	7E+3	1E+4	6E-6	2E-8	9E-5	9E-4
		D, see $^{193\text{m}}\text{Hg}$	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
		W, see $^{195\text{m}}\text{Hg}$	-	9E+3	4E-6	1E-8	-	-
80	Mercury-199m <sup>2</sup>	Vapor	-	8E+4	3E-5	1E-7	-	-
		Organic D	6E+4	2E+5	7E-5	2E-7	-	-
			St wall (1E+5)	-	-	-	1E-3	1E-2
		D, see $^{193\text{m}}\text{Hg}$	6E+4	1E+5	6E-5	2E-7	8E-4	8E-3
		W, see $^{193\text{m}}\text{Hg}$	-	2E+5	7E-5	2E-7	-	-
80	Mercury-203	Vapor	-	8E+2	4E-7	1E-9	-	-
		Organic D	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
		D, see $^{193\text{m}}\text{Hg}$	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
		W, see $^{193\text{m}}\text{Hg}$	-	1E+3	5E-7	2E-9	-	-
81	Thallium-194m <sup>2</sup>	D, all compounds	5E+4	2E+5	6E-5	2E-7	-	-
			St wall (7E+4)	-	-	-	1E-3	1E-2
81	Thallium-194 <sup>2</sup>	D, all compounds	3E+5	6E+5	2E-4	8E-7	-	-
			St wall (3E+5)	-	-	-	4E-3	4E-2
81	Thallium-195 <sup>2</sup>	D, all compounds	6E+4	1E+5	5E-5	2E-7	9E-4	9E-3
81	Thallium-197	D, all compounds	7E+4	1E+5	5E-5	2E-7	1E-3	1E-2
81	Thallium-198m <sup>2</sup>	D, all compounds	3E+4	5E+4	2E-5	8E-8	4E-4	4E-3
81	Thallium-198	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
81	Thallium-199	D, all compounds	6E+4	8E+4	4E-5	1E-7	9E-4	9E-3
81	Thallium-200	D, all compounds	8E+3	1E+4	5E-6	2E-8	1E-4	1E-3
81	Thallium-201	D, all compounds	2E+4	2E+4	9E-6	3E-8	2E-4	2E-3
81	Thallium-202	D, all compounds	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
81	Thallium-204	D, all compounds	2E+3	2E+3	9E-7	3E-9	2E-5	2E-4
82	Lead-195m <sup>2</sup>	D, all compounds	6E+4	2E+5	8E-5	3E-7	8E-4	8E-3
82	Lead-198	D, all compounds	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
82	Lead-199 <sup>2</sup>	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
82	Lead-200	D, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
82	Lead-201	D, all compounds	7E+3	2E+4	8E-6	3E-8	1E-4	1E-3
82	Lead-202m	D, all compounds	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
82	Lead-202	D, all compounds	1E+2	5E+1	2E-8	7E-11	2E-6	2E-5
82	Lead-203	D, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
82	Lead-205	D, all compounds	4E+3	1E+3	6E-7	2E-9	5E-5	5E-4
82	Lead-209	D, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
82	Lead-210	D, all compounds	6E-1	2E-1	1E-10	-	-	-
			Bone surf (1E+0)	Bone surf (4E-1)	-	6E-13	1E-8	1E-7
82	Lead-211 <sup>2</sup>	D, all compounds	1E+4	6E+2	3E-7	9E-10	2E-4	2E-3
82	Lead-212	D, all compounds	8E+1	3E+1	1E-8	5E-11	-	-
			Bone surf (1E+2)	-	-	-	2E-6	2E-5
82	Lead-214 <sup>2</sup>	D, all compounds	9E+3	8E+2	3E-7	1E-9	1E-4	1E-3
83	Bismuth-200 <sup>2</sup>	D, nitrates	3E+4	8E+4	4E-5	1E-7	4E-4	4E-3
		W, all other compounds	-	1E+5	4E-5	1E-7	-	-
83	Bismuth-201 <sup>2</sup>	D, see $^{200}\text{Bi}$	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
		W, see $^{200}\text{Bi}$	-	4E+4	2E-5	5E-8	-	-
83	Bismuth-202 <sup>2</sup>	D, see $^{200}\text{Bi}$	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see $^{200}\text{Bi}$	-	8E+4	3E-5	1E-7	-	-
83	Bismuth-203	D, see $^{200}\text{Bi}$	2E+3	7E+3	3E-6	9E-9	3E-5	3E-4
		W, see $^{200}\text{Bi}$	-	6E+3	3E-6	9E-9	-	-
83	Bismuth-205	D, see $^{200}\text{Bi}$	1E+3	3E+3	1E-6	3E-9	2E-5	2E-4
		W, see $^{200}\text{Bi}$	-	1E+3	5E-7	2E-9	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
83	Bismuth-206	D, see $^{200}\text{Bi}$	6E+2	1E+3	6E-7	2E-9	9E-6	9E-5
		W, see $^{200}\text{Bi}$	-	9E+2	4E-7	1E-9	-	-
83	Bismuth-207	D, see $^{200}\text{Bi}$	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
		W, see $^{200}\text{Bi}$	-	4E+2	1E-7	5E-10	-	-
83	Bismuth-210m	D, see $^{200}\text{Bi}$	4E+1	5E+0	2E-9	-	-	-
			Kidneys (6E+1)	Kidneys (6E+0)	-	9E-12	8E-7	8E-6
		W, see $^{200}\text{Bi}$	-	7E-1	3E-10	9E-13	-	-
83	Bismuth-210	D, see $^{200}\text{Bi}$	8E+2	2E+2	1E-7	-	1E-5	1E-4
			-	Kidneys (4E+2)	-	5E-10	-	-
		W, see $^{200}\text{Bi}$	-	3E+1	1E-8	4E-11	-	-
83	Bismuth-212 <sup>2</sup>	D, see $^{200}\text{Bi}$	5E+3	2E+2	1E-7	3E-10	7E-5	7E-4
		W, see $^{200}\text{Bi}$	-	3E+2	1E-7	4E-10	-	-
83	Bismuth-213 <sup>2</sup>	D, see $^{200}\text{Bi}$	7E+3	3E+2	1E-7	4E-10	1E-4	1E-3
		W, see $^{200}\text{Bi}$	-	4E+2	1E-7	5E-10	-	-
83	Bismuth-214 <sup>2</sup>	D, see $^{200}\text{Bi}$	2E+4	8E+2	3E-7	1E-9	-	-
			St wall (2E+4)	-	-	-	3E-4	3E-3
		W, see $^{200}\text{Bi}$	-	9E-2	4E-7	1E-9	-	-
84	Polonium-203 <sup>2</sup>	D, all compounds except those given for W	3E+4	6E+4	3E-5	9E-8	3E-4	3E-3
		W, oxides, hydroxides, and nitrates	-	9E+4	4E-5	1E-7	-	-
84	Polonium-205 <sup>2</sup>	D, see $^{203}\text{Po}$	2E+4	4E+4	2E-5	5E-8	3E-4	3E-3
		W, see $^{203}\text{Po}$	-	7E+4	3E-5	1E-7	-	-
84	Polonium-207	D, see $^{203}\text{Po}$	8E+3	3E+4	1E-5	3E-8	1E-4	1E-3
		W, see $^{203}\text{Po}$	-	3E+4	1E-5	4E-8	-	-
84	Polonium-210	D, see $^{203}\text{Po}$	3E+0	6E-1	3E-10	9E-13	4E-8	4E-7
		W, see $^{203}\text{Po}$	-	6E-1	3E-10	9E-13	-	-
85	Astatine-207 <sup>2</sup>	D, halides	6E+3	3E+3	1E-6	4E-9	8E-5	8E-4
		W	-	2E+3	9E-7	3E-9	-	-
85	Astatine-211	D, halides	1E+2	8E+1	3E-8	1E-10	2E-6	2E-5
		W	-	5E+1	2E-8	8E-11	-	-
86	Radon-220	With daughters removed	-	2E+4	7E-6	2E-8	-	-
		With daughters present	-	2E+1 (or 12 working level months)	9E-9 (or 1.0 working level)	3E-11	-	-
86	Radon-222	With daughters removed	-	1E+4	4E-6	1E-8	-	-
		With daughters present	-	1E+2 (or 4 working level months)	3E-8 (or 0.33 working level)	1E-10	-	-
87	Francium-222 <sup>2</sup>	D, all compounds	2E+3	5E+2	2E-7	6E-10	3E-5	3E-4
87	Francium-223 <sup>2</sup>	D, all compounds	6E+2	8E+2	3E-7	1E-9	8E-6	8E-5
88	Radium-223	W, all compounds	5E+0	7E-1	3E-10	9E-13	-	-
		Bone surf (9E+0)	-	-	-	-	1E-7	1E-6
88	Radium-224	W, all compounds	8E+0	2E+0	7E-10	2E-12	-	-
		Bone surf (2E+1)	-	-	-	-	2E-7	2E-6
88	Radium-225	W, all compounds	8E+0	7E-1	3E-10	9E-13	-	-
		Bone surf (2E+1)	-	-	-	-	2E-7	2E-6
88	Radium-226	W, all compounds	2E+0	6E-1	3E-10	9E-13	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
				ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )			
			Bone surf (5E+0)	-	-	-	6E-8	6E-7
88	Radium-227 <sup>2</sup>	W, all compounds	2E+4	1E+4	6E-6	-	-	-
			Bone surf (2E+4)	Bone surf (2E+4)	-	3E-8	3E-4	3E-3
88	Radium-228	W, all compounds	2E+0	1E+0	5E-10	2E-12	-	-
			Bone surf (4E+0)	-	-	-	6E-8	6E-7
89	Actinium-224	D, all compounds except those given for W and Y	2E+3	3E+1	1E-8	-	-	-
			LLI wall (2E+3)	Bone surf (4E+1)	-	5E-11	3E-5	3E-4
		W, halides and nitrates	-	5E+1	2E-8	7E-11	-	-
		Y, oxides and hydroxides	-	5E+1	2E-8	6E-11	-	-
89	Actinium-225	D, see <sup>224</sup> Ac	5E+1	3E-1	1E-10	-	-	-
			LLI wall (5E+1)	Bone surf (5E-1)	-	7E-13	7E-7	7E-6
		W, see <sup>224</sup> Ac	-	6E-1	3E-10	9E-13	-	-
		Y, see <sup>224</sup> Ac	-	6E-1	3E-10	9E-13	-	-
89	Actinium-226	D, see <sup>224</sup> Ac	1E+2	3E+0	1E-9	-	-	-
			LLI wall (1E+2)	Bone surf (4E+0)	-	5E-12	2E-6	2E-5
		W, see <sup>224</sup> Ac	-	5E+0	2E-9	7E-12	-	-
		Y, see <sup>224</sup> Ac	-	5E+0	2E-9	6E-12	-	-
89	Actinium-227	D, see <sup>224</sup> Ac	2E-1	4E-4	2E-13	-	-	-
			Bone surf (4E-1)	Bone surf (8E-4)	-	1E-15	5E-9	5E-8
		W, see <sup>224</sup> Ac	-	2E-3	7E-13	-	-	-
			-	Bone surf (3E-3)	-	4E-15	-	-
		Y, see <sup>224</sup> Ac	-	4E-3	2E-12	6E-15	-	-
89	Actinium-228	D, see <sup>224</sup> Ac	2E+3	9E+0	4E-9	-	3E-5	3E-4
			-	Bone surf (2E+1)	-	2E-11	-	-
		W, see <sup>224</sup> Ac	-	4E+1	2E-8	-	-	-
			-	Bone surf (6E+1)	-	8E-11	-	-
		Y, see <sup>224</sup> Ac	-	4E+1	2E-8	6E-11	-	-
90	Thorium-226 <sup>2</sup>	W, all compounds except those given for Y	5E+3	2E+2	6E-8	2E-10	-	-
			St wall (5E+3)	-	-	-	7E-5	7E-4
		Y, oxides and hydroxides	-	1E+2	6E-8	2E-10	-	-
90	Thorium-227	W, see <sup>226</sup> Th	1E+2	3E-1	1E-10	5E-13	2E-6	2E-5
		Y, see <sup>226</sup> Th	-	3E-1	1E-10	5E-13	-	-
90	Thorium-228	W, see <sup>226</sup> Th	6E+0	1E-2	4E-12	-	-	-
			Bone surf (1E+1)	Bone surf (2E-2)	-	3E-14	2E-7	2E-6
		Y, see <sup>226</sup> Th	-	2E-2	7E-12	2E-14	-	-
90	Thorium-229	W, see <sup>226</sup> Th	6E-1	9E-4	4E-13	-	-	-
			Bone surf (1E+0)	Bone surf (2E-3)	-	3E-15	2E-8	2E-7
		Y, see <sup>226</sup> Th	-	2E-3	1E-12	-	-	-
			-	Bone surf (3E-3)	-	4E-15	-	-
90	Thorium-230	W, see <sup>226</sup> Th	4E+0	6E-3	3E-12	-	-	-
			Bone surf (9E+0)	Bone surf (2E-2)	-	2E-14	1E-7	1E-6
		Y, see <sup>226</sup> Th	-	2E-2	6E-12	-	-	-
			-	Bone surf (2E-2)	-	3E-14	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
90	Thorium-231	W, see $^{226}\text{Th}$	4E+3	6E+3	3E-6	9E-9	5E-5	5E-4
		Y, see $^{226}\text{Th}$	-	6E+3	3E-6	9E-9	-	-
90	Thorium-232	W, see $^{226}\text{Th}$	7E-1	1E-3	5E-13	-	-	-
		Bone surf (2E+0)	Bone surf (3E-3)	-	4E-15	3E-8	3E-7	
		Y, see $^{226}\text{Th}$	-	3E-3	1E-12	-	-	-
			-	Bone surf (4E-3)	-	6E-15	-	-
90	Thorium-234	W, see $^{228}\text{Th}$	3E+2	2E+2	8E-8	3E-10	-	-
		LLI wall (4E+2)	-	-	-	-	5E-6	5E-5
		Y, see $^{226}\text{Th}$	-	2E+2	6E-8	2E-10	-	-
91	Protactinium-227 <sup>2</sup>	W, all compounds except those given for Y	4E+3	1E+2	5E-8	2E-10	5E-5	5E-4
		Y, oxides and hydroxides	-	1E+2	4E-8	1E-10	-	-
91	Protactinium-228	W, see $^{227}\text{Pa}$	1E+3	1E+1	5E-9	-	2E-5	2E-4
		Bone surf (2E+1)	-	3E-11	-	-	-	
		Y, see $^{227}\text{Pa}$	-	1E+1	5E-9	2E-11	-	-
91	Protactinium-230	W, see $^{227}\text{Pa}$	6E+2	5E+0	2E-9	7E-12	-	-
		Bone surf (9E+2)	-	-	-	-	1E-5	1E-4
		Y, see $^{227}\text{Pa}$	-	4E+0	1E-9	5E-12	-	-
91	Protactinium-231	W, see $^{227}\text{Pa}$	2E-1	2E-3	6E-13	-	-	-
		Bone surf (5E-1)	Bone surf (4E-3)	-	6E-15	6E-9	6E-8	
		Y, see $^{227}\text{Pa}$	-	4E-3	2E-12	-	-	-
			-	Bone surf (6E-3)	-	8E-15	-	-
91	Protactinium-232	W, see $^{227}\text{Pa}$	1E+3	2E+1	9E-9	-	2E-5	2E-4
		Bone surf (6E+1)	-	8E-11	-	-	-	
		Y, see $^{227}\text{Pa}$	-	6E+1	2E-8	-	-	-
			-	Bone surf (7E+1)	-	1E-10	-	-
91	Protactinium-233	W, see $^{227}\text{Pa}$	1E+3	7E+2	3E-7	1E-9	-	-
		LLI wall (2E+3)	-	-	-	-	2E-5	2E-4
		Y, see $^{227}\text{Pa}$	-	6E+2	2E-7	8E-10	-	-
91	Protactinium-234	W, see $^{227}\text{Pa}$	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4
		Y, see $^{227}\text{Pa}$	-	7E+3	3E-6	9E-9	-	-
92	Uranium-230	D, $\text{UF}_6$ , $\text{UO}_2\text{F}_2$ , $\text{UO}_2(\text{NO}_3)_2$	4E+0	4E-1	2E-10	-	-	-
		Bone surf (6E+0)	Bone surf (6E-1)	-	8E-13	8E-8	8E-7	
		W, $\text{UO}_3$ , $\text{UF}_4$ , $\text{UCl}_4$	-	4E-1	1E-10	5E-13	-	-
		Y, $\text{UO}_2$ , $\text{U}_3\text{O}_8$	-	3E-1	1E-10	4E-13	-	-
92	Uranium-231	D, see $^{230}\text{U}$	5E+3	8E+3	3E-6	1E-8	-	-
		LLI wall (4E+3)	-	-	-	-	6E-5	6E-4
		W, see $^{230}\text{U}$	-	6E+3	2E-6	8E-9	-	-
			-	5E+3	2E-6	6E-9	-	-
92	Uranium-232	D, see $^{230}\text{U}$	2E+0	2E-1	9E-11	-	-	-
		Bone surf (4E+0)	Bone surf (4E-1)	-	6E-13	6E-8	6E-7	
		W, see $^{230}\text{U}$	-	4E-1	2E-10	5E-13	-	-
		Y, see $^{230}\text{U}$	-	8E-3	3E-12	1E-14	-	-
92	Uranium-233	D, see $^{230}\text{U}$	1E+1	1E+0	5E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
		W, see $^{230}\text{U}$	-	7E-1	3E-10	1E-12	-	-
		Y, see $^{230}\text{U}$	-	4E-2	2E-11	5E-14	-	-
92	Uranium-234 <sup>3</sup>	D, see $^{230}\text{U}$	1E+1	1E+0	5E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	
		W, see $^{230}\text{U}$	-	7E-1	3E-10	1E-12	-	-
		Y, see $^{230}\text{U}$	-	4E-2	2E-11	5E-14	-	-
92	Uranium-235 <sup>3</sup>	D, see $^{230}\text{U}$	1E+1	1E+0	6E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	
		W, see $^{230}\text{U}$	-	8E-1	3E-10	1E-12	-	-
		Y, see $^{230}\text{U}$	-	4E-2	2E-11	6E-14	-	-
92	Uranium-236	D, see $^{230}\text{U}$	1E+1	1E+0	5E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	
		W, see $^{230}\text{U}$	-	8E-1	3E-10	1E-12	-	-
		Y, see $^{230}\text{U}$	-	4E-2	2E-11	6E-14	-	-
92	Uranium-237	D, see $^{230}\text{U}$	2E+3	3E+3	1E-6	4E-9	-	-
		LLI wall (2E+3)	-	-	-	3E-5	3E-4	
		W, see $^{230}\text{U}$	-	2E+3	7E-7	2E-9	-	-
		Y, see $^{230}\text{U}$	-	2E+3	6E-7	2E-9	-	-
92	Uranium-238 <sup>3</sup>	D, see $^{230}\text{U}$	1E+1	1E+0	6E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	
		W, see $^{230}\text{U}$	-	8E-1	3E-10	1E-12	-	-
		Y, see $^{230}\text{U}$	-	4E-2	2E-11	6E-14	-	-
92	Uranium-239 <sup>2</sup>	D, see $^{230}\text{U}$	7E+4	2E+5	8E-5	3E-7	9E-4	9E-3
		W, see $^{230}\text{U}$	-	2E+5	7E-5	2E-7	-	-
		Y, see $^{230}\text{U}$	-	2E+5	6E-5	2E-7	-	-
92	Uranium-240	D, see $^{230}\text{U}$	1E+3	4E+3	2E-6	5E-9	2E-5	2E-4
		W, see $^{230}\text{U}$	-	3E+3	1E-6	4E-9	-	-
		Y, see $^{230}\text{U}$	-	2E+3	1E-6	3E-9	-	-
92	Uranium-natural <sup>3</sup>	D, see $^{230}\text{U}$	1E+1	1E+0	5E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6	
		W, see $^{230}\text{U}$	-	8E-1	3E-10	9E-13	-	-
		Y, see $^{230}\text{U}$	-	5E-2	2E-11	9E-14	-	-
93	Neptunium-232 <sup>2</sup>	W, all compounds	1E+5	2E+3	7E-7	-	2E-3	2E-2
			-	Bone surf (5E+2)	-	6E-9	-	-
93	Neptunium-233 <sup>2</sup>	W, all compounds	8E+5	3E+6	1E-3	4E-6	1E-2	1E-1
93	Neptunium-234	W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
93	Neptunium-235	W, all compounds	2E+4	8E+2	3E-7	-	-	-
		LLI wall (2E+4)	Bone surf (1E+3)	-	2E-9	3E-4	3E-3	
93	Neptunium-236 (1.15E+5 y)	W, all compounds	3E+0	2E-2	9E-12	-	-	-
		Bone surf (6E+0)	Bone surf (5E-2)	-	8E-14	9E-8	9E-7	
93	Neptunium-236m (22.5 h)	W, all compounds	3E+3	3E+1	1E-8	-	-	-
		Bone surf (4E+3)	Bone surf (7E+1)	-	1E-10	5E-5	5E-4	
93	Neptunium-237	W, all compounds	5E-1	4E-3	2E-12	-	-	-
		Bone surf (1E+0)	Bone surf (1E-2)	-	1E-14	2E-8	2E-7	
93	Neptunium-238	W, all compounds	1E+3	6E+1	3E-8	-	2E-5	2E-4
			Bone surf (2E+2)	-	2E-10	-	-	
93	Neptunium-239	W, all compounds	2E+3	2E+3	9E-7	3E-9	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
				ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )			
			LLI wall (2E+3)	-	-	-	2E-5	2E-4
93	Neptunium-240 <sup>2</sup>	W, all compounds	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
94	Plutonium-234	W, all compounds except PuO <sub>2</sub>	8E+3	2E+2	9E-8	3E-10	1E-4	1E-3
		Y, PuO <sub>2</sub>	-	2E+2	8E-8	3E-10	-	-
94	Plutonium-235 <sup>2</sup>	W, see <sup>234</sup> Pu	9E+5	3E+6	1E-3	4E-6	1E-2	1E-1
		Y, see <sup>234</sup> Pu	-	3E+6	1E-3	3E-6	-	-
94	Plutonium-236	W, see <sup>234</sup> Pu	2E+0	2E-2	8E-12	-	-	-
		Bone surf (4E+0)	Bone surf (4E-2)	-	5E-14	6E-8	6E-7	
		Y, see <sup>234</sup> Pu	-	4E-2	2E-11	6E-14	-	-
94	Plutonium-237	W, see <sup>234</sup> Pu	1E+4	3E+3	1E-6	5E-9	2E-4	2E-3
		Y, see <sup>234</sup> Pu	-	3E+3	1E-6	4E-9	-	-
94	Plutonium-238	W, see <sup>234</sup> Pu	9E-1	7E-3	3E-12	-	-	-
		Bone surf (2E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7	
		Y, see <sup>234</sup> Pu	-	2E-2	8E-12	2E-14	-	-
94	Plutonium-239	W, see <sup>234</sup> Pu	8E-1	6E-3	3E-12	-	-	-
		Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7	
		Y, see <sup>234</sup> Pu	-	2E-2	7E-12	-	-	-
			-	Bone surf (2E-2)	-	2E-14	-	-
94	Plutonium-240	W, see <sup>234</sup> Pu	8E-1	6E-3	3E-12	-	-	-
		Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7	
		Y, see <sup>234</sup> Pu	-	2E-2	7E-12	-	-	-
			-	Bone surf (2E-2)	-	2E-14	-	-
94	Plutonium-241	W, see <sup>234</sup> Pu	4E+1	3E-1	1E-10	-	-	-
		Bone surf (7E+1)	Bone surf (6E-1)	-	8E-13	1E-6	1E-5	
		Y, see <sup>234</sup> Pu	-	8E-1	3E-10	-	-	-
			-	Bone surf (1E+0)	-	1E-12	-	-
94	Plutonium-242	W, see <sup>234</sup> Pu	8E-1	7E-3	3E-12	-	-	-
		Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7	
		Y, see <sup>234</sup> Pu	-	2E-2	7E-12	-	-	-
			-	Bone surf (2E-2)	-	2E-14	-	-
94	Plutonium-243	W, see <sup>234</sup> Pu	2E+4	4E+4	2E-5	5E-8	2E-4	2E-3
		Y, see <sup>234</sup> Pu	-	4E+4	2E-5	5E-8	-	-
94	Plutonium-244	W, see <sup>234</sup> Pu	8E-1	7E-3	3E-12	-	-	-
		Bone surf (2E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7	
		Y, see <sup>234</sup> Pu	-	2E-2	7E-12	-	-	-
			-	Bone surf (2E-2)	-	2E-14	-	-
94	Plutonium-245	W, see <sup>234</sup> Pu	2E+3	5E+3	2E-6	6E-9	3E-5	3E-4
		Y, see <sup>234</sup> Pu	-	4E+3	2E-6	6E-9	-	-
94	Plutonium-246	W, see <sup>234</sup> Pu	4E+2	3E+2	1E-7	4E-10	-	-
		LLI wall (4E+2)	-	-	-	-	6E-6	6E-5
		Y, see <sup>234</sup> Pu	-	3E+2	1E-7	4E-10	-	-
95	Americium-237 <sup>2</sup>	W, all compounds	8E+4	3E+5	1E-4	4E-7	1E-3	1E-2
95	Americium-	W, all compounds	4E+4	3E+3	1E-6	-	5E-4	5E-3

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
	$^{238}\text{Pu}$		-	Bone surf (6E+3)	-	9E-9	-	-
95	Americium-239	W, all compounds	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
95	Americium-240	W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
95	Americium-241	W, all compounds	8E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
95	Americium-242m	W, all compounds	8E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
95	Americium-242	W, all compounds	4E+3	8E+1	4E-8	-	5E-5	5E-4
			-	Bone surf (9E+1)	-	1E-10	-	-
95	Americium-243	W, all compounds	8E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
95	Americium-244m <sup>2</sup>	W, all compounds	6E+4	4E+3	2E-6	-	-	-
			St wall (8E+4)	Bone surf (7E+3)	-	1E-8	1E-3	1E-2
95	Americium-244	W, all compounds	3E+3	2E+2	8E-8	-	4E-5	4E-4
			-	Bone surf (3E+2)	-	4E-10	-	-
95	Americium-245	W, all compounds	3E+4	8E+4	3E-5	1E-7	4E-4	4E-3
95	Americium-246m <sup>2</sup>	W, all compounds	5E+4	2E+5	8E-5	3E-7	-	-
			St wall (6E+4)	-	-	-	8E-4	8E-3
95	Americium-246 <sup>2</sup>	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
96	Curium-238	W, all compounds	2E+4	1E+3	5E-7	2E-9	2E-4	2E-3
96	Curium-240	W, all compounds	6E+1	6E-1	2E-10	-	-	-
			Bone surf (8E+1)	Bone surf (6E-1)	-	9E-13	1E-6	1E-5
96	Curium-241	W, all compounds	1E+3	3E+1	1E-8	-	2E-5	2E-4
			-	Bone surf (4E+1)	-	5E-11	-	-
96	Curium-242	W, all compounds	3E+1	3E-1	1E-10	-	-	-
			Bone surf (5E+1)	Bone surf (3E-1)	-	4E-13	7E-7	7E-6
96	Curium-243	W, all compounds	1E+0	9E-3	4E-12	-	-	-
			Bone surf (2E+0)	Bone surf (2E-2)	-	2E-14	3E-8	3E-7
96	Curium-244	W, all compounds	1E+0	1E-2	5E-12	-	-	-
			Bone surf (3E+0)	Bone surf (2E-2)	-	3E-14	3E-8	3E-7
96	Curium-245	W, all compounds	7E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
96	Curium-246	W, all compounds	7E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
96	Curium-247	W, all compounds	8E-1	6E-3	3E-12	-	-	-
			Bone surf (1E+0)	Bone surf (1E-2)	-	2E-14	2E-8	2E-7
96	Curium-248	W, all compounds	2E-1	2E-3	7E-13	-	-	-
			Bone surf (4E-1)	Bone surf (3E-3)	-	4E-15	5E-9	5E-8
96	Curium-249 <sup>2</sup>	W, all compounds	5E+4	2E+4	7E-6	-	7E-4	7E-3
			-	Bone surf (3E+4)	-	4E-8	-	-
96	Curium-250	W, all compounds	4E-2	3E-4	1E-13	-	-	-
			Bone surf (6E-2)	Bone surf (5E-4)	-	8E-16	9E-10	9E-9
97	Berkelium-245	W, all compounds	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
97	Berkelium-246	W, all compounds	3E+3	3E+3	1E-6	4E-9	4E-5	4E-4
97	Berkelium-247	W, all compounds	5E-1	4E-3	2E-12	-	-	-
			Bone surf (1E+0)	Bone surf (9E-3)	-	1E-14	2E-8	2E-7
97	Berkelium-249	W, all compounds	2E+2	2E+0	7E-10	-	-	-
			Bone surf (5E+2)	Bone surf (4E+0)	-	5E-12	6E-6	6E-5
97	Berkelium-250	W, all compounds	9E+3	3E+2	1E-7	-	1E-4	1E-3
			-	Bone surf (7E+2)	-	1E-9	-	-
98	Californium-244 <sup>2</sup>	W, all compounds except those given for Y	3E+4	6E+2	2E-7	8E-10	-	-
			St wall (3E+4)	-	-	-	4E-4	4E-3
98	Californium-246	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	4E+2	9E+0	4E-9	1E-11	5E-6	5E-5
			-	9E+0	4E-9	1E-11	-	-
98	Californium-248	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	8E+0	6E-2	3E-11	-	-	-
			Bone surf (2E+1)	Bone surf (1E-1)	-	2E-13	2E-7	2E-6
98	Californium-249	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	5E-1	4E-3	2E-12	-	-	-
			Bone surf (1E+0)	Bone surf (9E-3)	-	1E-14	2E-8	2E-7
			-	1E-2	4E-12	-	-	-
98	Californium-250	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	-	Bone surf (1E-2)	-	2E-14	-	-
			1E+0	9E-3	4E-12	-	-	-
98	Californium-251	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	Bone surf (2E+0)	Bone surf (2E-2)	-	3E-14	3E-8	3E-7
			-	3E-2	1E-11	4E-14	-	-
98	Californium-251	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	5E-1	4E-3	2E-12	-	-	-
			Bone surf (1E+0)	Bone surf (9E-3)	-	1E-14	2E-8	2E-7
			-	1E-2	4E-12	-	-	-
98	Californium-252	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	-	Bone surf (1E-2)	-	2E-14	-	-
			2E+0	2E-2	8E-12	-	-	-
98	Californium-253	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	Bone surf (5E+0)	Bone surf (4E-2)	-	5E-14	7E-8	7E-7
			-	3E-2	1E-11	5E-14	-	-
98	Californium-253	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	2E+2	2E+0	8E-10	3E-12	-	-
			Bone surf (4E+2)	-	-	-	5E-6	5E-5
98	Californium-254	W, see <sup>244</sup> Cf Y, see <sup>244</sup> Cf	-	2E+0	7E-10	2E-12	-	-
			2E+0	2E-2	9E-12	3E-14	3E-8	3E-7
99	Einsteinium-250	W, all compounds	-	2E-2	7E-12	2E-14	-	-
			4E+4	5E+2	2E-7	-	6E-4	6E-3
99	Einsteinium-251	W, all compounds	-	Bone surf (1E+3)	-	2E-9	-	-
			7E+3	9E+2	4E-7	-	1E-4	1E-3
99	Einsteinium-253	W, all compounds	-	Bone surf (1E+3)	-	2E-9	-	-
			2E+2	1E+0	6E-10	2E-12	2E-6	2E-5
99	Einsteinium-254m	W, all compounds	3E+2	1E+1	4E-9	1E-11	-	-
			LLI wall (3E+2)	-	-	-	4E-6	4E-5
99	Einsteinium-254	W, all compounds	8E+0	7E-2	3E-11	-	-	-
			Bone surf (2E+1)	Bone surf (1E-1)	-	2E-13	2E-7	2E-6
100	Fermium-252	W, all compounds	5E+2	1E+1	5E-9	2E-11	6E-6	6E-5

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Oral Ingestion ALI ( $\mu\text{Ci}$ )	Inhalation		Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )							
100	Fermium-253	W, all compounds	1E+3	1E+1	4E-9	1E-11	1E-5	1E-4
100	Fermium-254	W, all compounds	3E+3	9E+1	4E-8	1E-10	4E-5	4E-4
100	Fermium-255	W, all compounds	5E+2	2E+1	9E-9	3E-11	7E-6	7E-5
100	Fermium-257	W, all compounds	2E+1	2E-1	7E-11	-	-	-
			Bone surf (4E+1)	Bone surf (2E-1)	-	3E-13	5E-7	5E-6
101	Mendelevium-257	W, all compounds	7E+3	8E+1	4E-8	-	1E-4	1E-3
			-	Bone surf (9E+1)	-	1E-10	-	-
101	Mendelevium-258	W, all compounds	3E+1	2E-1	1E-10	-	-	-
			Bone surf (5E+1)	Bone surf (3E-1)	-	5E-13	6E-7	6E-6
-	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours	Submersion	-	2E+2	1E-7	1E-9	-	-
-	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours		-	2E-1	1E-10	1E-12	1E-8	1E-7
-	Any single radionuclide not listed above that decays by alpha emission or spontaneous fission, or any mixture for which either the identity or the concentration of any radionuclide in the mixture is not known	-	-	4E-4	2E-13	1E-15	2E-9	2E-8

ENDNOTES:

<sup>1</sup>"Submersion" means that values given are for submersion in a hemispherical semi-infinite cloud of airborne material.

<sup>2</sup> These radionuclides have radiological half-lives of less than 2 hours. The total effective dose equivalent received during operations with these radionuclides might include a significant contribution from external exposure. The DAC values for all radionuclides, other than those designated Class "Submersion," are based upon the committed effective dose equivalent due to the intake of the radionuclide into the body and do not include potentially significant contributions to dose equivalent from external exposures. The licensee may substitute 1E-7  $\mu\text{Ci/ml}$  for the listed DAC to account for the submersion dose prospectively, but should use individual monitoring devices or other radiation measuring instruments that measure external exposure to demonstrate compliance with the limits. (See 1200-02-05-52.)

<sup>3</sup> For soluble mixtures of U-238, U-234, and U-235 in air, chemical toxicity may be the limiting factor (see 1200-02-05-.50(5)). If the percent by weight (enrichment) of U-235 is not greater than 5, the concentration value for a 40-hour workweek is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed  $8E-3$  (SA)  $\mu\text{Ci-hr/ml}$ , where SA is the specific activity of the uranium inhaled. The specific activity for natural uranium is  $6.77E-7$  curies per gram U. The specific activity for other mixtures of U-238, U-235, and U-234, if not known, shall be:

$$\text{SA} = 3.6E-7 \text{ curies/gram U U-depleted}$$

$$\text{SA} = [0.4 + 0.38 (\text{enrichment}) + 0.0034 (\text{enrichment})^2] E-6, \text{ enrichment} \geq 0.72$$

where enrichment is the percentage by weight of U-235, expressed as percent.

NOTE:

1. If the identity of each radionuclide in a mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.
2. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in this schedule are not present in the mixture, the inhalation ALI, DAC, and effluent and sewage concentrations for the mixture are the lowest values specified in this schedule for any radionuclide that is not known to be absent from the mixture; or

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci/ml}$ )
			Inhalation			Air ( $\mu\text{Ci/ml}$ )	Water ( $\mu\text{Ci/ml}$ )	
Oral Ingestion ALI ( $\mu\text{Ci}$ )	ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci/ml}$ )						
	If it is known that Ac-227-D and Cm-250-W are not present		-	7E-4	3E-13	-	-	-
	If, in addition, it is known that Ac-227-W, Y, Th-229-W, Y, Th-230-W, Th-232-W, Y, Pa-231-W, Y, Np-237-W, Pu-239-W, Pu-240-W, Pu-242-W, Am-241-W, Am-242m-W, Am-243-W, Cm-245-W, Cm-246-W, Cm-247-W, Cm-248-W, Bk-247-W, Cf-249-W, and Cf-251-W are not present		-	7E-3	3E-12	-	-	-
	If, in addition, it is known that Sm-146-W, Sm-147-W, Gd-148-D, W, Gd-152-D, W, Th-228-W, Y, Th-230-Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, Np-236-W, Pu-236-W, Y, Pu-238-W, Y, Pu-239-Y, Pu-240-Y, Pu-242-Y, Pu-244-W, Y, Cm-243-W, Cm-244-W, Cf-248-W, Cf-249-Y, Cf-250-W, Y, Cf-251-Y, Cf-252-W, Y, and Cf-254-W, Y are not present		-	7E-2	3E-11	-	-	-
	If, in addition, it is known that Pb-210-D, Bi-210m-W, Po-210-D, W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D, W, Y, Th-227-W, Y, U-230-D, W, Y, U-232-D, W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-Y, Es-254-W, Fm-257-W, and Md-258-W are not present		-	7E-1	3E-10	-	-	-
	If, in addition, it is known that Si-32-Y, Ti-44-Y, Fe-60-D, Sr-90-Y, Zr-93-D, Cd-113m-D, Cd-113-D, In-115-D, W, La-138-D, Lu-176-W, Hf-178m-D, W, Hf-182-D, W, Bi-210m-D, Ra-224-W, Ra-228-W, Ac-226-D, W, Y, Pa-230-W, Y, U-233-D, W, U-234-D, W, U-235-D, W, U-236-D, W, U-238-D, W, Pu-241-Y, Bk-249-W, Cf-253-W, Y, and Es-253-W are not present		-	7E+0	3E-9	-	-	-
	If it is known that Ac-227-D, W, Y, Th-229-W, Y, Th-232-W, Y, Pa-231-W, Y, Cm-248-W, and Cm-250-W are not present		-	-	-	1E-14	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Concentration ( $\mu\text{Ci}/\text{ml}$ )
			Inhalation			Air ( $\mu\text{Ci}/\text{ml}$ )	Water ( $\mu\text{Ci}/\text{ml}$ )	
Oral Ingestion ALI ( $\mu\text{Ci}$ )	ALI ( $\mu\text{Ci}$ )	DAC ( $\mu\text{Ci}/\text{ml}$ )						
	If, in addition, it is known that Sm-146-W, Gd-148-D, W, Gd-152-D, Th-228-W, Y, Th-230-W, Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, U-Nat-Y, Np-236-W, Np-237-W, Pu-236-W, Y, Pu-238-W, Y, Pu-239-W, Y, Pu-240-W, Y, Pu-242-W, Y, Pu-244-W, Y, Am-241-W, Am-242m-W, Am-243-W, Cm-243-W, Cm-244-W, Cm-245-W, Cm-246-W, Cm-247-W, Bk-247-W, Cf-249-W, Y, Cf-250-W, Y, Cf-251-W, Y, Cf-252-W, Y, and Cf-254-W, Y are not present		-	-	-	1E-13	-	-
	If, in addition, it is known that Sm-147-W, Gd-152-W, Pb-210-D, Bi-210m-W, Po-210-D, W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D, W, Y, Th-227-W, Y, U-230-D, W, Y, U-232-D, W, U-Nat-W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-W, Y, Es-254-W, Fm-257-W, and Md-258-W are not present		-	-	-	1E-12	-	-
	If, in addition it is known that Fe-60, Sr-90, Cd-113m, Cd-113, In-115, I-129, Cs-134, Sm-145, Sm-147, Gd-148, Gd-152, Hg-194 (organic), Bi-210m, Ra-223, Ra-224, Ra-225, Ac-225, Th-228, Th-230, U-233, U-234, U-235, U-236, U-238, U-Nat, Cm-242, Cf-248, Es-254, Fm-257, and Md-258 are not present		-	-	-	-	1E-6	1E-5

3. If a mixture of radionuclides consists of uranium and its daughters in ore dust (10  $\mu\text{m}$  AMAD particle distribution assumed) prior to chemical separation of the uranium from the ore, the following values may be used for the DAC of the mixture: 6E-11  $\mu\text{Ci}$  of gross alpha activity from uranium-238, uranium-234, thorium-230, and radium-226 per milliliter of air; 3E-11  $\mu\text{Ci}$  of natural uranium per milliliter of air; or 45 micrograms of natural uranium per cubic meter of air.

4. If the identity and concentration of each radionuclide in a mixture are known, the limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Schedule RHS 8-30 for the specific radionuclide when not in a mixture. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity").

Example: If radionuclides "A," "B," and "C" are present in concentrations  $C_A$ ,  $C_B$ , and  $C_C$ , and if the applicable DACs are  $\text{DAC}_A$ ,  $\text{DAC}_B$ , and  $\text{DAC}_C$ , respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{\text{DAC}_A} + \frac{C_B}{\text{DAC}_B} + \frac{C_C}{\text{DAC}_C} \leq 1$$

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

### New Rules

Chapter 1200-02-05 is amended by adding new rules 1200-02-05-.127 Disposal of Certain Byproduct Material and 1200-02-05-.146 Reports to Individuals of Exceeding Dose Limits. The new rules shall read as follows:

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- 1200-02-05-.127 Disposal of Certain Byproduct Material
- 1200-02-05-.146 Reports to Individuals of Exceeding Dose Limits

- (1) Licensed material as defined in subparagraphs (c) and (d) of the definition of *Byproduct material* set forth in Rule 1200-02-05-.32(11) may be disposed of in accordance with Chapter 1200-02-11, even though it is not defined as low-level radioactive waste. Therefore, any licensed byproduct material being disposed of

at a facility, or transferred for ultimate disposal at a facility licensed under Chapter 1200-02-11, must meet the requirements of Rule 1200-02-05-.125.

- (2) A licensee may dispose of byproduct material, as defined in subparagraphs (c) and (d) of the definition of Byproduct material set forth in Rule 1200-02-05-.32(11), at a disposal facility authorized to dispose of such material in accordance with any Federal or State solid or hazardous waste law, including the Solid Waste Disposal Act, as authorized under the Energy Policy Act of 2005.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

1200-02-05-.146 Reports to Individuals of Exceeding Dose Limits.

When a licensee or registrant is required by Rule 1200-02-05-.143 or 1200-02-05-.144 to report to the Division any exposure of an identified occupationally exposed individual, or an identified member of the public, to radiation or radioactive material, the licensee or registrant shall also provide the individual a report on his or her exposure data included in the report to the Division. This report must be transmitted no later than the transmittal to the Division.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

#### Chapter 1200-02-07 Use of Radionuclides in the Healing Arts

##### Amendments

Paragraph (32) of Rule 1200-02-07-.05 Definitions is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (32) shall read as follows:

- (32) ~~Reserved~~ "Radioactive drug" means any chemical compound containing radioactive material that may be used on or administered to patients or human research subjects as an aid in the diagnosis, treatment, or prevention of disease or other abnormal condition.

Rule 1200-02-07-.05 Definitions is amended by adding new paragraph (45) so that, as amended, paragraph (45) shall read as follows:

- (45) "Positron Emission Tomography (PET) radionuclide production facility" is defined as a facility operating a cyclotron or accelerator for the purpose of producing PET radionuclides.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-07-.14 Notifications is amended by deleting the rule and substituting the following so that, as amended, Rule 1200-02-07-.14 shall read as follows:

1200-02-07-.14 Notifications.

- (1) A licensee shall provide to the Division a copy of the board certification, the Nuclear Regulatory Commission, Agreement State or Licensing State license, or the permit issued by a licensee of broad scope for each individual no later than thirty (30) days after the date that the Licensee permits the individual to work as an authorized user, an authorized nuclear pharmacist or an authorized medical physicist, pursuant to Rule 1200-02-07-.13(1)(b).

~~(4)~~(2) A licensee shall notify the Division no later than thirty days after:

- (a) An authorized user, an authorized nuclear pharmacist, a radiation safety officer, or an authorized medical physicist permanently discontinues performance of duties under the license or has a name change;
- (b) The licensee's mailing address changes;

- (c) The licensee's name changes, but the name change does not constitute a transfer of control of the license as described in Rule 1200-02-10-.16(2); or
  - (d) The licensee has added to or changed the areas of use identified in the application or on the license where radioactive material is used under either Rule 1200-02-07-.38 or 1200-02-07-.40.
- (2)(3) The licensee shall send the documents required in this rule to the Division at the address listed in Rule 1200-02-04-.07(1)(c).

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (4) of Rule 1200-02-07-.15 Exemptions Regarding Specific Licenses of Broad Scope is amended by deleting "1200-02-07-.14(1)(a)" between the word "of" and "regarding" and replacing it with "Rule 1200-02-07-.14(2)(a)" so that, as amended, paragraph (4) shall read as follows:

- (4) The provisions of ~~1200-02-07-.14(1)(a)~~ Rule 1200-02-07-.14(2)(a) regarding notification to the Division for new authorized users, new authorized medical physicists and new authorized nuclear pharmacists;

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subpart (ii) of part 2 of subparagraph (b) of paragraph (1) of Rule 1200-02-07-.23 Training of Radiation Safety Officer is amended by adding "Rule 1200-02-07-.26," between the word "under" and "1200-02-07-.43" so that, as amended, subpart (ii) shall read as follows:

- (ii) In clinical nuclear medicine facilities providing diagnostic and/or therapeutic services under the direction of physicians who meet the requirements for authorized users under Rule 1200-02-07-.26, 1200-02-07-.43 or 1200-02-07-.47; and

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Part 2 of subparagraph (b) of paragraph (1) of Rule 1200-02-07-.24 Training for Authorized Medical Physicist is amended by adding "Rule 1200-02-07-.26," between the word "in" and "1200-02-07-.59" so that, as amended, part 2 shall read as follows:

- 2. In clinical radiation facilities providing high energy, external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services under the direction of physicians who meet the requirements for authorized users in Rule 1200-02-07-.26, 1200-02-07-.59 or 1200-02-07-.80; and

Subparagraph (b) of paragraph (2) of Rule 1200-02-07-.24 Training for Authorized Medical Physicist is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (b) shall read as follows:

- (b) Has obtained written attestation that the individual has satisfactorily completed the requirements in subparagraphs (1)(a) and (1)(b) and paragraph (3), or subparagraph (2)(a) and paragraph (3) of this rule, and has achieved a level of competency sufficient to function independently as an authorized medical physicist for each type of therapeutic medical unit for which the individual is requesting authorized medical physicist status. The written attestation must be signed by a preceptor authorized medical physicist who meets the requirements in Rule 1200-02-07-.24, Rule 1200-02-07-.26 or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements for an authorized medical physicist for each type of therapeutic medical unit for which the individual is requesting authorized medical physicist status; and

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-07-.26 Training for Experienced Radiation Safety Officer, Teletherapy or Medical Physicist, Authorized User, and Nuclear Pharmacist is amended by adding paragraph (3) which shall read as follows:

- (3) Individuals who need not comply with training requirements as described in this rule may serve as preceptors for, and supervisors of, applicants seeking authorization on Division or NRC licenses for the same uses for which these individuals are authorized.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-07-.30 Determination of Dosages of Unsealed Radioactive Material for Medical Use is amended by deleting the rule and substituting the following so that, as amended, Rule 1200-02-07-.30 shall read as follows:

1200-02-07-.30 Determination of Dosages of Unsealed Radioactive Material For Medical Use.

- (1) A licensee shall determine and record the activity of each dosage before medical use.
- (2) For a unit dosage, this determination must be made by:
- (a) Direct measurement of radioactivity; or
  - (b) A decay correction, based on the activity or activity concentration determined by:
    1. A manufacturer or preparer licensed under Rule 1200-02-10-.13(10) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements; or
    2. An Agreement State or U.S. Nuclear Regulatory Commission licensee for use in research in accordance with a radioactive drug research committee-approved protocol or an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA).
    3. A PET radioactive drug producer licensed under Rule 1200-02-10-.11(8) or equivalent Agreement State requirements.
- (3) For other than unit dosages, this determination must be made by:
- (a) Direct measurement of radioactivity;
  - (b) Combination of measurement of radioactivity and mathematical calculations; or
  - (c) Combination of volumetric measurements and mathematical calculations, based on the measurement made by: ~~a manufacturer or preparer licensed under 1200-02-10-.13(10) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements.~~
    1. A manufacturer or preparer licensed under Rule 1200-02-10-.13(10) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements; or
    2. A PET radioactive drug producer licensed under Rule 1200-02-10-.11(8) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-.38 Use of Unsealed Radioactive Material for Uptake, Dilution, and Excretion Studies for Which a Written Directive is Not Required is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) Except for quantities that require a written directive under Rule 1200-02-07-.20(2), a licensee may use any unsealed radioactive material, prepared for medical use for uptake, dilution, or excretion that is:
- (a) Obtained from: ~~a manufacturer or preparer licensed under 1200-02-10-.13(10) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements; or~~
    1. A manufacturer or preparer licensed under Rule 1200-02-10-.13(10) or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements; or

2. A PET radioactive drug producer licensed under Rule 1200-02-10-11(8) or equivalent Agreement State requirements; or
- (b) ~~Prepared by an authorized nuclear pharmacist, a physician who is an authorized user and who meets the requirements specified in 1200-02-07-43 or 1200-02-07-47 and 1200-02-07-43(1)(c)1(ii)(VII), or an individual under the supervision, as specified in 1200-02-07-19; or~~ Excluding production of PET radionuclides, prepared by:
1. An authorized nuclear pharmacist;
  2. A physician who is an authorized user and who meets the requirements specified in Rule 1200-02-07-43, or Rule 1200-02-07-47 and Rule 1200-02-07-43(1)(c)1(ii)(VII); or
  3. An individual under the supervision, as specified in Rule 1200-02-07-19, of the authorized nuclear pharmacist in part 1 of this subparagraph or the physician who is an authorized user in part 2 of this subparagraph; or
- (c) Obtained from and prepared by an Agreement State or U.S. Nuclear Regulatory Commission licensee for use in research in accordance with a radioactive drug research committee-approved protocol or an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA); or
- (d) Prepared by the licensee in accordance with a Radioactive Drug Research Committee approved application or an Investigational New Drug (IND) protocol accepted by Food and Drug Administration (FDA) for use in research.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subpart (ii) of Part 1 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-39 Training for Uptake, Dilution, and Excretion Studies is amended by adding "Rule 1200-02-07-26," between the words "in" and "1200-02-07-39" so that, as amended, subpart (ii) shall read as follows:

- (ii) Work experience, under the supervision of an authorized user who meets the requirements in Rule 1200-02-07-26, 1200-02-07-39, 1200-02-07-43, or 1200-02-07-47 or equivalent U.S. Nuclear Regulatory Commission or agreement State requirements, involving:

Part 2 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-39 Training for Uptake, Dilution, and Excretion Studies is amended by adding "Rule 1200-02-07-26," between the words "in" and "1200-02-07-39" so that, as amended, part 2 shall read as follows:

2. Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in Rule 1200-02-07-26, 1200-02-07-39, 1200-02-07-43, or 1200-02-07-47 or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements, that the individual has satisfactorily completed the requirements in parts (1)(a)1 or (1)(c)1 of this rule and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized under Rule 1200-02-07-38.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-40 Use of Unsealed Radioactive Material for Imaging and Localization Studies for Which a Written Directive is Not Required is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) A licensee may use, for imaging and localization studies, any radioactive material prepared for medical use, in quantities that do not require a written directive as described in Rule 1200-02-07-20(2) that is:

- (a) Obtained from: ~~a manufacturer or preparer licensed under Chapter 1200-02-10-13(10) or equivalent regulations of another Agreement State or U.S. Nuclear Regulatory Commission requirements; or~~
  - 1. A manufacturer or preparer licensed under Rule 1200-02-10-13(10) or equivalent regulations of another Agreement State or U.S. Nuclear Regulatory Commission requirements; or
  - 2. A PET radioactive drug producer licensed under Rule 1200-02-10-11(8) or equivalent Agreement State requirements; or
- (b) Excluding production of PET radionuclides prepared by an authorized nuclear pharmacist, a physician who is an authorized user and who meets the requirements specified in Rule 1200-02-07-43, or Rule 1200-02-07-47 and Rule 1200-02-07-43(1)(c)1(ii)(VII), or an individual under the supervision of either as specified in Rule 1200-02-07-19; or
- (c) Obtained from and prepared by an Agreement State or U.S. Nuclear Regulatory Commission licensee for use in research in accordance with a radioactive drug research committee-approved protocol or an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA); or
- (d) Prepared by the licensee for use in research in accordance with a radioactive drug research committee-approved application or an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA).

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-41 Radionuclide Contaminants is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) A licensee shall not administer to humans a ~~radioactive drug containing~~ radiopharmaceutical that contains:
  - (a) More than 0.15 kilobecquerel of molybdenum-99 per megabecquerel of technetium-99m (0.15  $\mu$ Ci of Mo-99 per mCi of Tc-99m); or
  - (b) More than 0.02 kilobecquerel of strontium-82 per megabecquerel of rubidium-82 chloride injection (0.02  $\mu$ Ci of Sr-82 per mCi of Rb-82 chloride); or more than 0.2 kilobecquerel of strontium-85 per megabecquerel of rubidium-82 chloride injection (0.2  $\mu$ Ci of Sr-85 per mCi of Rb-82).
  - ~~(c) More than 0.2 kilobecquerel of strontium-85 per megabecquerel of rubidium-82 chloride injection (0.2  $\mu$ Ci of Sr-85 per mCi of Rb-82).~~

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subpart (ii) of Part 1 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-43 Training for Imaging and Localization Studies is amended by adding ", Rule 1200-02-07-.26," between the words "rule" and "or" so that, as amended, subpart (ii) shall read as follows:

- (ii) Work experience, under the supervision of an authorized user, who meets the requirements in this rule, Rule 1200-02-07-.26, or item (VII) of this subpart and Rule 1200-02-07-47 or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements, involving:

Part 2 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-43 Training for Imaging and Localization Studies is amended by deleting the part and substituting the following so that, as amended, part 2 shall read as follows:

- 2. Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or Rule 1200-02-07-47 and item 1(ii)(VII) of this subparagraph or equivalent Agreement State or U.S. Nuclear Regulatory

Commission requirements, that the individual has satisfactorily completed the requirements in parts (a)1 or (c)1 of this paragraph and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized under Rules 1200-02-07-.38 and 1200-02-07-.40.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-.44 Use of Unsealed Radioactive Material for Which a Written Directive is Required is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) A licensee may use any unsealed radioactive material for diagnostic or therapeutic medical use for which a written directive is required that has been:
  - (a) ~~Obtained from: a manufacturer or preparer licensed under 1200-02-07-10-.13(10) or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements; or~~
    1. A manufacturer or preparer licensed under Rule 1200-02-10-.13(10) or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements; or
    2. A PET radioactive drug producer licensed under Rule 1200-02-10-.11(8) or equivalent Agreement State requirements; or
  - (b) Excluding production of PET radionuclides prepared by an authorized nuclear pharmacist, a physician who is an authorized user and who meets the requirements specified in Rule 1200-02-07-.43, Rule 1200-02-07-.47, or an individual under the supervision of either as specified in Rule 1200-02-07-.19; or
  - (c) Obtained from and prepared by an Agreement State or U.S. Nuclear Regulatory Commission licensee for use in research in accordance with an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA) for use in research; or
  - (d) Prepared by the licensee for use in research in accordance with an investigational new drug (IND) protocol accepted by Food and Drug Administration (FDA).

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subpart (ii) of Part 1 of subparagraph (b) of paragraph (1) of Rule 1200-02-07-.47 Training for Use of Unsealed Radioactive Material for Which a Written Directive is Required is amended by adding "Rule 1200-02-07-.26," between the words "rule," and "or" so that, as amended, subpart (ii) shall read as follows:

- (ii) Work experience, under the supervision of an authorized user who meets the requirements of this rule, Rule 1200-02-07-.26, or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements. A supervising authorized user, who meets the requirements in this subparagraph, must also have experience in administering dosages in the same dosage category or categories (i.e., item (VI) of this subpart) as the individual requesting authorized user status. The work experience must involve:

Part 2 of subparagraph (b) of paragraph (1) of Rule 1200-02-07-.47 Training for Use of Unsealed Radioactive Material for Which a Written Directive is Required is amended by deleting the part and substituting the following so that, as amended, part 2 shall read as follows:

2. Have obtained written attestation that the individual has satisfactorily completed the requirements in ~~subparagraph~~ part (a)1 and item (b)1(ii)(VI) of this paragraph or ~~subparagraph (b)~~ part 1 of this subparagraph and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized under Rule 1200-02-07-.44. The written attestation must be signed by a preceptor authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements. The

preceptor authorized user, who meets the requirements in this subparagraph, must have experience in administering dosages in the same dosage category or categories (i.e., item 1(ii)(VI) of this subparagraph) as the individual requesting authorized user status.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subparagraph (a) of paragraph (1) of Rule 1200-02-07-.48 Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less Than or Equal to 1.22 Gigabecquerels (33 Millicuries) is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (a) shall read as follows:

- (a) Is certified by a medical specialty board whose certification process includes all of the requirements in subparagraph (c) of this paragraph and whose certification has been recognized by the Division, the U.S. Nuclear Regulatory Commission or an Agreement State and who meets the requirements in part (c)3 of this paragraph; (The names of board certifications which have been recognized by the U.S. Nuclear Regulatory Commission or an Agreement State will be posted on the U.S. Nuclear Regulatory Commission's Web page); or

Part 2 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-.48 Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less Than or Equal to 1.22 Gigabecquerels (33 Millicuries) is amended by deleting the part, but not its subparts, and substituting the following so that, as amended, part 2, prior to its subparts, shall read as follows:

2. Has work experience, under the supervision of an authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47, 1200-02-07-.48, 1200-02-07-.49, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements. A supervising authorized user who meets the requirements in Rule 1200-02-07-.47(1)(b), must also have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)I and/or II. The work experience must involve:

Part 3 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-.48 Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less Than or Equal to 1.22 Gigabecquerels (33 Millicuries) is amended by deleting the part and substituting the following so that, as amended, part 3 shall read as follows:

3. Has obtained written attestation that the individual has satisfactorily completed the requirements in parts 1 and 2 of this subparagraph and has achieved a level of competency sufficient to function independently as an authorized user for medical uses authorized under Rule 1200-02-07-.44. The written attestation must be signed by a preceptor authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47, 1200-02-07-.48, 1200-02-07-.49, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements. A preceptor authorized user, who meets the requirement in Rule 1200-02-07-.47(1)(b), must also have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)I and/or II.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Part 2 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-.49 Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less greater than 1.22 Gigabecquerels (33 Millicuries) is amended by deleting the part, but not its subparts, and substituting the following so that, as amended, part 2, prior to its subparts, shall read as follows:

2. Has work experience, under the supervision of an authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47, 1200-02-07-.49 or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements. A supervising authorized user, who meets the requirements in Rule 1200-02-07-.47(1)(b), must have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)II. The work experience must involve:

Part 3 of subparagraph (c) of paragraph (1) of Rule 1200-02-07-.49 Training for the Oral Administration of Sodium Iodine I-131 Requiring a Written Directive in Quantities Less greater than 1.22 Gigabecquerels (33 Millicuries) is amended by deleting the part and substituting the following so that, as amended, part 3 shall read as follows:

3. Has obtained written attestation that the individual has satisfactorily completed the requirements in parts 1 and 2 of this subparagraph and has achieved a level of competency sufficient to function independently as an authorized user for medical uses authorized under Rule 1200-02-07-.44. The written attestation must be signed by a preceptor authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47, 1200-02-07-.49, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements. A preceptor authorized user, who meets the requirements in Rule 1200-02-07-.47(1)(b), must have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)II.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-.50 Training for the Parenteral Administration of Unsealed Radioactive Material Requiring a Written Directive is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) Except as provided in Rule 1200-02-07-.26, a licensee shall require an authorized user for the parenteral administration requiring a written directive, to be a physician who:
  - (a) Is an authorized user under Rule 1200-02-07-.47 for uses listed in Rule 1200-02-07-.47(1)(b)1(ii)(VI)III or 1200-02-07-.47(1)(b)1(ii)(VI)IV, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements; or
  - (b) Is an authorized user under Rule 1200-02-07-.59 or 1200-02-07-.80, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements and who meets the requirements in subparagraph (d) of this paragraph; or
  - (c) Is certified by a medical specialty board whose certification process has been recognized by the U.S. Nuclear Regulatory Commission or an Agreement State under Rule 1200-02-07-.59 or 1200-02-07-.80, and who meets the requirements in subparagraph (d) of this paragraph.
  - (d)
    1. Has successfully completed 80 hours of classroom and laboratory training, applicable to parenteral administrations, for which a written directive is required, of any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV, and/or parenteral administration of any other radionuclide for which a written directive is required. The training must include:
      - (i) Radiation physics and instrumentation;
      - (ii) Radiation protection;
      - (iii) Mathematics pertaining to the use and measurement of radioactivity;
      - (iv) Chemistry of radioactive material for medical use; and
      - (v) Radiation biology; and
    2. Has work experience, under the supervision of an authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47 or 1200-02-07-.50, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements, in the parenteral administration, for which a written directive is required, of any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV, and/or parenteral administration of any other radionuclide for which a written directive is required. A supervising authorized user who meets the requirements in Rule 1200-02-07-.47 must have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)III and/or IV. The work experience must involve:

- (i) Ordering, receiving, and unpacking radioactive materials safely, and performing the related radiation surveys;
  - (ii) Performing quality control procedures on instruments used to determine the activity of dosages, and performing checks for proper operation of survey meters;
  - (iii) Calculating, measuring, and safely preparing patient or human research subject dosages;
  - (iv) Using administrative controls to prevent a misadministration involving the use of unsealed radioactive material;
  - (v) Using procedures to contain spilled radioactive material safely, and using proper decontamination procedures; and
  - (vi) Administering dosages to patients or human research subjects, that include at least three cases involving the parenteral administration, for which a written directive is required, of any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV and/or at least three cases involving the parenteral administration of any other radionuclide, for which a written directive is required; and
- (e)3. Has obtained written attestation that the individual has satisfactorily completed the requirements in subparagraphs (b) or (c) of this paragraph, and has achieved a level of competency sufficient to function independently as an authorized user for the parenteral administration of unsealed radioactive material requiring a written directive. The written attestation must be signed by a preceptor authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.47, 1200-02-07-.50, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements. A preceptor authorized user, who meets the requirements in Rule 1200-02-07-.47, must have experience in administering dosages as specified in Rule 1200-02-07-.47(1)(b)1(ii)(VI)III and/or IV.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-07-.59 Training for Use of Manual Brachytherapy Sources is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

- (1) Except as provided in Rule 1200-02-07-.26, a licensee shall require an authorized user of a manual brachytherapy source for the uses authorized under Rule 1200-02-07-.51 to be a physician who:
  - (a) Is certified by a medical specialty board whose certification process has been recognized by the Division, the U.S. Nuclear Regulatory Commission, or an Agreement State, and who meets the requirements in part (4)(b)3 of this rule paragraph. (The names of board certifications which have been recognized by the U.S. Nuclear Regulatory Commission or an Agreement State will be posted on the U.S. Nuclear Regulatory Commission's Web page.) To be recognized, a specialty board shall require all candidates for certification to:
    - 1. Successfully complete a minimum of 3 years of residency training in a radiation oncology program approved by the Residency Review Committee of the Accreditation Council for Graduate Medical Education or Royal College of Physicians and Surgeons of Canada or the Committee on Postgraduate Training of the American Osteopathic Association; and
    - 2. Pass an examination, administered by diplomates of the specialty board, which tests knowledge and competence in radiation safety, radionuclide handling, treatment planning, quality assurance, and clinical use of manual brachytherapy; or
  - (b) 1. Has completed a structured educational program in basic radionuclide handling techniques applicable to the use of manual brachytherapy sources that includes:

- (i) 200 hours of classroom and laboratory training in the following areas:
    - (I) Radiation physics and instrumentation;
    - (II) Radiation protection;
    - (III) Mathematics pertaining to the use and measurement of radioactivity; and
    - (IV) Radiation biology; and
  - (ii) 500 hours of work experience, under the supervision of an authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements at a medical institution, involving:
    - (I) Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
    - (II) Checking survey meters for proper operation;
    - (III) Preparing, implanting, and removing brachytherapy sources;
    - (IV) Maintaining running inventories of material on hand;
    - (V) Using administrative controls to prevent a misadministration involving the use of radioactive material;
    - (VI) Using emergency procedures to control radioactive material; and
2. Has completed three (3) years of supervised clinical experience in radiation oncology, under an authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements, as part of a formal training program approved by the Residency Review Committee for Radiation Oncology of the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada or the Committee on Postdoctoral Training of the American Osteopathic Association. This experience may be obtained concurrently with the supervised work experience required by subpart 1(ii) of this subparagraph; and
  3. Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements, that the individual has satisfactorily completed the requirements in part (a)1, or parts (b)1 and 2 of this paragraph and has achieved a level of competency sufficient to function independently as an authorized user of manual brachytherapy sources for the medical uses authorized under Rule 1200-02-07-.51.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Part 3 of subparagraph (b) of paragraph (1) of rule 1200-02-07-.60 Training for Ophthalmic Use of Strontium-90 is amended by deleting the part and substituting the following so that, as amended, part 3 shall read as follows:

3. Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in Rule 1200-02-07-.26, 1200-02-07-.59, this rule, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements, that the individual has satisfactorily completed the requirements in subparagraphs ~~(a)~~ and (b) of this paragraph and has achieved a level of competency sufficient to function independently as an authorized user of strontium-90 for ophthalmic use.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Subparagraph (b) of paragraph (1) of rule 1200-02-07-.80 Training for Use of Remote Afterloader Units, Teletherapy Units, and Gamma Stereotactic Radiosurgery Units is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (b) shall read as follows:

- (b) 1. Has completed a structured educational program in basic radionuclide techniques applicable to the use of a sealed source in a therapeutic medical unit that includes:
- (i) 200 hours of classroom and laboratory training in the following areas:
    - (I) Radiation physics and instrumentation;
    - (II) Radiation protection;
    - (III) Mathematics pertaining to the use and measurement of radioactivity; and
    - (IV) Radiation biology; and
  - (ii) 500 hours of work experience, under the supervision of an authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent Agreement State or U.S. Nuclear Regulatory Commission requirements at a medical institution, involving:
    - (I) Reviewing full calibration measurements and periodic spot-checks;
    - (II) Preparing treatment plans and calculating treatment doses and times;
    - (III) Using administrative controls to prevent a misadministration involving the use of radioactive material;
    - (IV) Implementing emergency procedures to be followed in the event of the abnormal operation of the medical unit or console;
    - (V) Checking and using survey meters; and
    - (VI) Selecting the proper dose and how it is to be administered; and
2. Has completed three years of supervised clinical experience in radiation therapy, under an authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements, as part of a formal training program approved by the Residency Review Committee for Radiation Oncology of the Accreditation Council for Graduate Medical Education or Royal College of Physicians and Surgeons of Canada or the Committee on Postdoctoral Training of the American Osteopathic Association. This experience may be obtained concurrently with the supervised work experience required by subpart 1(ii) of this subparagraph; and
3. Has obtained written attestation that the individual has satisfactorily completed the requirements in part (a)1 of this paragraph or part 1 of this subparagraph, and part 2 of this subparagraph and subparagraph (c) of this rule and has achieved a level of competency sufficient to function independently as an authorized user of each type of therapeutic medical unit for which the individual is requesting authorized user status. The written attestation must be signed by a preceptor authorized user who meets the requirements in this rule, Rule 1200-02-07-.26, or equivalent U.S. Nuclear Regulatory Commission or Agreement State requirements for an authorized user for each type of therapeutic medical unit for which the individual is requesting authorized user status; and

Amendments

Rule 1200-02-10-.02 Scope is amended by deleting the rule and substituting the following so that, as amended, Rule 1200-02-10-.02 shall read as follows:

1200-02-10-.02 Scope.

Except as otherwise specifically provided, no person shall manufacture, produce, receive, possess, use, transfer, own, or acquire radioactive material unless authorized in a specific or general license issued pursuant to this chapter. All other sources of radiation, registered inspectors, and x-ray installations and services unless exempt from this Chapter under Rule 1200-02-10-.03, 1200-02-10-.04, 1200-02-10-.06, 1200-02-10-.07 or 1200-02-10-.30 shall be registered with the Division in accordance with the requirements of Rule 1200-02-10-.24 of this Chapter.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (1) of Rule 1200-02-10-.04 Exemptions: Radioactive Materials Other Than Source Material is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (1) shall read as follows:

(1) Exempt concentrations.

- (a) Except as provided in Rule 1200-02-10-.04(1)(b) and (d), any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires products containing radioactive material introduced in concentrations not in excess of those listed in Schedule RHS 8-4.
- (b) No person may introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under Rule 1200-02-10-.04(1)(a) or equivalent regulations of the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State except in accordance with a license issued pursuant to ~~4200-02-10-.13(8) or the general license provided in 1200-02-10-.10 and 1200-02-10-.29~~ 10 CFR 32.11.
- (c) This paragraph shall not be deemed to authorize the import of radioactive material or products containing radioactive material.
- (d) A manufacturer, processor, or producer of a product or material is exempt from the requirements for a license set forth in these regulations to the extent that this person transfers radioactive material contained in a product or material in concentrations not in excess of those specified in Schedule RHS 8-4 in the Appendix to this Chapter and introduced into the product or material by a licensee holding a specific license issued by the NRC expressly authorizing such introduction. This exemption does not apply to the transfer of radioactive material contained in any food, beverage, cosmetic, drug, or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

Paragraph (2) of Rule 1200-02-10-.04 Exemptions: Radioactive Materials Other Than Source Material is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (2) shall read as follows:

(2) Exempt products.

- (a) Except for persons who apply radioactive materials to or persons who incorporate radioactive material into the products listed in this paragraph, any person is exempt from these regulations to the extent that he receives, possesses, uses, transfers, owns or acquires the following products:
  - (a)1. Time pieces or hands or dials containing not more than the following quantities of radioactive material and not exceeding the following specified levels of radiation:
    - 4-(i) 25 millicuries of tritium per timepiece;

- 2-(ii) 5 millicuries of tritium per hand;
  - 3-(iii) 15 millicuries of tritium per dial (bezels when used shall be considered as part of the dial);
  - 4-(iv) 100 microcuries of promethium-147 per watch or 200 microcuries of promethium-147 per any other timepiece;
  - 5-(v) 20 microcuries of promethium-147 per watch hand or 40 microcuries of promethium-147 per other timepiece hand;
  - 6-(vi) 60 microcuries of promethium-147 per watch dial or 120 microcuries of promethium-147 per other timepiece dial (bezels when used shall be considered part of the dial);
  - 7-(vii) The levels of radiation from hands and dials containing radioactive materials will not exceed when measured through 50 milligrams per square centimeter of absorber:
    - (i) For wrist watches, 0.1 millirad per hour at 10 centimeters from any surface;
    - (ii) For pocket watches, 0.1 millirad per hour at 1 centimeter from any surface;
    - (iii) For any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface.
  - 8-(viii) One (1) microcuries of radium-226 per timepiece in intact timepieces acquired manufactured prior to the effective date of this regulation.
- (b)2. ~~Reserved. Lock illuminators containing not more than 15 millicuries of tritium or not more than 2 millicuries of promethium-147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium-147 will not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.~~
  - (c)3. Balances of precision containing not more than 1 millicurie of tritium per balance or not more than 0.5 millicurie of tritium per balance part manufactured before December 17, 2007.
  - (d)4. ~~Reserved. Automobile shift quadrants containing not more than 25 millicuries of tritium.~~
  - (e)5. Marine compasses containing not more than 750 millicuries of tritium gas and other marine navigational instruments containing not more than 250 millicuries of tritium gas manufactured before December 17, 2007.
  - (f)6. ~~Reserved. Thermostat dials and pointers containing not more than 25 millicuries of tritium per thermostat.~~
  - (g)7. Electron tubes<sup>1</sup> containing not more than one of the following specified quantities of radioactive material per tube:
    - 4-(i) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube;

<sup>1</sup> "Electron tubes", as used in this subparagraph, include spark gap tubes, power tubes, gas tubes, including glow lamps, receiving tubes, microwave tubes, indicator tubes, pickup tubes, radiation detection tubes and any other completely sealed tube that is designed to conduct or control electrical currents.

- 2-(ii) 1 microcurie of cobalt-60;
- 3-(iii) 5 microcuries of nickel-63;
- 4-(iv) 30 microcuries of krypton-85;
- 5-(v) 5 microcuries of cesium-137;
- 6-(vi) 30 microcuries of promethium-147;

provided, the levels of radiation from each electron tube containing radioactive material do not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber.

(h)8. ~~Reserved. Resins containing scandium-46 and designed for sand consolidation in oil wells.~~

- 1. ~~Any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns or acquires synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells.~~
- 2. ~~Such resins shall have been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the Division or any Agreement State to the manufacturer of such resins pursuant to licensing requirements equivalent to those in Sections 32.16 and 32.17 of 10 CFR (Code of Federal Regulations) Part 32 of the regulations of the U.S. Nuclear Regulatory Commission.~~
- 3. ~~This exemption does not authorize the manufacture of any resins containing scandium-46.~~

(i)9. Gas and aerosol detectors containing radioactive material.

- 4-(i) Except for persons who manufacture, process, ~~or~~ produce, or initially transfer for sale or distribution gas and aerosol detectors containing radioactive material, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards provided that detectors containing radioactive material shall have been manufactured, ~~imported~~ processed, produced, or initially transferred<sup>2</sup> in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to section 32.26 of 10 CFR Part 32 or a licensing state pursuant to regulations equivalent to Rule 1200-02-10-.13(15) that authorizes the initial transfer of the detectors to persons who are exempt from regulatory requirements. This exemption also covers gas and aerosol detectors manufactured or distributed before the effective date of these rules in accordance with a specific license issued by an Agreement State under comparable provisions to Rule 1200-02-10-.13(15) authorizing distribution to persons exempt from regulatory requirements.
- 2-(ii) Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State shall be considered exempt under ~~1200-02-10-.04(2)(i)1.~~ Rule 1200-02-10-.04(2)(a)9(i), provided that the device is labeled in accordance with the specific license authorizing distribution of the generally licensed device, and provided further that they meet the requirements of Rule 1200-02-10-.13(15).
- 3-(iii) Gas and aerosol detectors containing NARM previously manufactured and distributed in accordance with a specific license issued by a Licensing State shall

be considered exempt under ~~1200-02-10-.04(2)(i)1~~ Rule 1200-02-10-.04(2)(a)9(i), provided that the device is labeled in accordance with the specific license authorizing distribution, and provided further that they meet the requirements of Rule 1200-02-10-.13(15).

~~(j)~~10. Self luminous products containing radioactive material.

- 4-(i) Except for persons who manufacture, process, or produce self-luminous products containing tritium, krypton-85, or promethium-147, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns or acquires tritium, krypton-85, promethium-147 in self luminous products manufactured, processed, produced, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.22 of 10 CFR Part 32, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements.
- 2-(ii) The exemption in ~~1200-02-10-.04(2)(i)1~~ Rule 1200-02-10-.04(2)(a)10(i) does not apply to tritium, krypton-85, or promethium-147 used in products for frivolous purposes or in toys or adornments.
- 3-(iii) Any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or owns self luminous products containing less than 0.1 microcurie of radium-226 which were acquired prior to the effective date of this regulation.

~~(k)~~11. Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material; provided that:

- 4-(i) Each source contains no more than one exempt quantity set forth in Schedule RHS 8-3;
- 2-(ii) Each instrument contains no more than 10 exempt quantities. For purposes of this ~~subparagraph (k)~~ part, an instrument's source(s) may contain either one type or different types of radionuclides and an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in Schedule RHS 8-3, provided that the sum of such fractions shall not exceed unity; and
- 3-(iii) For purposes of this ~~subparagraph (k)~~ part, 0.05 microcuries of americium-241 is considered an exempt quantity under Schedule RHS 8-3.

~~(i)~~12. ~~Reserved. Spark gap irradiators containing not more than 1 microcurie of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least 3 gallons per hour (11.4 liters per hour).~~

13. Ionization chamber smoke detectors containing not more than 1 microcurie ( $\mu\text{Ci}$ ) of americium-241 per detector in the form of a foil and designed to protect life and property from fires.

- (b) Any person who desires to apply radioactive material to, or to incorporate radioactive material into, the products exempted in subparagraph (a) of this paragraph or who desires to initially transfer for sale or distribution such products containing radioactive material, should apply for a specific license pursuant to 10 CFR 32.14, which license states that the product may be distributed by the licensee to persons exempt from subparagraph (a) of this paragraph.

Subparagraph (a) of Paragraph (3) of Rule 1200-02-10-.04 Exemptions: Radioactive Materials Other Than Source Material is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (a) shall read as follows:

- (a) Except as provided in (c) and ~~(d)~~ through (e) of this paragraph, any person is exempt from these

regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in Schedule RHS 8-3; ~~however, these quantities shall not be administered in any form to human beings internally or externally for any purpose.~~

Subparagraph (b) of Paragraph (3) of Rule 1200-02-10-.04 Exemptions: Radioactive Materials Other Than Source Material is amended by deleting the subparagraph and substituting the following so that, as amended, subparagraph (b) shall read as follows:

- (b) Any person who possesses radioactive material received or acquired before September 25, 1971, under the general license formerly provided in ~~subparagraph RHS 7.203 A.2~~ this Chapter is exempt from the requirements for a license set forth in this Chapter to the extent that such person possesses, uses, transfers, or owns such radioactive material. ~~Such exemption does not apply for radium-226.~~

Subparagraph (e) of Paragraph (3) of Rule 1200-02-10-.04 Exemptions: Radioactive Materials Other Than Source Material is amended by adding subparagraph (e) so that, as amended, subparagraph (e) shall read as follows:

- (e) No person may, for purposes of producing an increased radiation level, combine quantities of radioactive material covered by this exemption so that the aggregate quantity exceeds the limits set forth in Schedule RHS 8-3 in the Appendix to this Chapter, except for radioactive material combined within a device placed in use before May 3, 1999, or as otherwise permitted by the regulations in this Chapter.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Part 1 of subparagraph (b) of paragraph (2) of Rule 1200-02-10-.10 General Licenses - Radioactive Material Other Than Source Material is amended by deleting the part and substituting the following so that, as amended, part 1 shall read as follows:

1. The general license in subparagraph (a) of this paragraph applies only to radioactive material contained in devices that have been manufactured or initially transferred and labeled in accordance with the specifications contained in:
  - (i) A specific license issued by the Division pursuant to ~~4200-02-10-.13(4)~~ Rule 1200-02-10-.13(5), or
  - (ii) A specific license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.51 or an Agreement State ~~or a Licensing State that authorizes distribution of devices to persons generally licensed by the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State with provisions comparable to Rule 1200-02-10-.13(5).~~

Subpart (ii) of Part 8 of Subparagraph (c) of Paragraph (2) of Rule 1200-02-10-.10 General Licenses - Radioactive Material Other Than Source Material is amended by deleting the subpart, but not its items, and substituting the following so that, as amended, subpart (ii), prior to its items, shall read as follows:

- (ii) Shall within thirty (30) days after the transfer of a device to a specific licensee or export, furnish a report to the Division. The report shall contain:

Subpart (iii) of Part 8 of Subparagraph (c) of Paragraph (2) of Rule 1200-02-10-.10 General Licenses - Radioactive Material Other Than Source Material is amended by deleting the subpart and substituting the following so that, as amended, Subpart (iii) shall read as follows:

- (iii) Shall obtain written Division approval before transferring the device to any other specific licensee not specifically identified in subpart ~~(2)(e)8(i)~~ of this part. However a holder of a specific license may transfer a device for possession and use under its own specific license without prior approval, if, the holder:
  - (i) Verifies that the specific license authorizes the possession and use, or

applies for and obtains an amendment to the license authorizing the possession and use;

- (II) Removes, alters, covers, or clearly and unambiguously augments the existing label (otherwise required by part 1 of this subparagraph) so that the device is labeled in compliance with Rule 1200-02-05-.113 of these regulations; however the manufacturer, model number, and serial number must be retained;
- (III) Obtains manufacturer's or initial transferor's information concerning maintenance that would be applicable under the specific license (such as leak testing procedures); and
- (IV) Reports the transfer under subpart (ii) of this part.

Part 14 of Subparagraph (c) of Paragraph (2) of Rule 1200-02-10-.10 General Licenses - Radioactive Material Other Than Source Material is amended by deleting the part and substituting the following so that, as amended, part 14 shall read as follows:

- 14. Shall be subject to the bankruptcy notification requirement in paragraph (7) of Rule 1200-02-10-.16(7) if holding devices containing radioactive material that meet the following criteria, based on the activity indicated on the label:
  - (i) At least 10 mCi (370MBq) of cesium-137;
  - (ii) At least 0.1 mCi (3.7 MBq) of strontium-90;
  - (iii) At least 1 mCi (37 MBq) of cobalt-60; or
  - (iv) At least 1 mCi (37 MBq) of americium-241 or any other transuranic (i.e., element with atomic number greater than uranium (92)); or
  - (v) At least 0.1 mCi (37 MBq) of radium-226.

Rule 1200-02-10-.10 General Licenses - Radioactive Material Other Than Source Material is amended by adding paragraph (8) so that, as amended, paragraph (8) shall read as follows:

(8) Self Luminous Products Containing Radium-226

- (a) A general license is hereby issued to any person to acquire, receive, possess, use, or transfer, in accordance with the provisions of subparagraphs (b) through (d) of this paragraph, radium-226 contained in the following products manufactured prior to the effective date of these rules.
  - 1. Antiquities originally intended for use by the general public. For the purposes of this paragraph, antiquities mean products originally intended for use by the general public and distributed in the late 19th and early 20th centuries, such as radium emanator jars, revigators, radium water jars, radon generators, refrigerator cards, radium bath salts, and healing pads.
  - 2. Intact timepieces containing greater than 0.037 MBq (1  $\mu$ Ci), nonintact timepieces, and timepiece hands and dials no longer installed in timepieces.
  - 3. Luminous items installed in air, marine, or land vehicles.
  - 4. All other luminous products provided that no more than 100 items are used or stored at the same location at any one time.
  - 5. Small radium sources containing no more than 0.037 MBq (1  $\mu$ Ci) of radium-226. For the purposes of this paragraph, "small radium sources" means discrete survey instrument check sources, sources contained in radiation measuring instruments, sources used in

educational demonstrations (such as cloud chambers and spinthariscopes), electron tubes, lightning rods, ionization sources, static eliminators, or as designated by the NRC.

- (b) Persons who acquire, receive, possess, use, or transfer byproduct material under the general license issued in subparagraph (a) of this paragraph are exempt from the provisions of Chapters 1200-02-04 and 1200-02-05, and Rule 1200-02-10-.26, to the extent that the receipt, possession, use, or transfer of byproduct material is within the terms of the general license; provided, however, that this exemption shall not be deemed to apply to any such person specifically licensed under this Chapter.
- (c) Any person who acquires, receives, possesses, uses, or transfers byproduct material in accordance with the general license in subparagraph (a) of this paragraph shall:
1. Notify the Division should there be any indication of possible damage to the product so that it appears it could result in a loss of the radioactive material (a report containing a brief description of the event, and the remedial action taken, must be furnished to the Division at the address listed in Rule 1200-02-04-.07 within thirty (30) days);
  2. Not abandon products containing radium-226 (the product, and any radioactive material from the product, may only be disposed of according to Rule 1200-02-05-.127 of these regulations or by transfer to a person authorized by a specific license to receive the radium-226 in the product or as otherwise approved by the NRC or an Agreement State;
  3. Not export products containing radium-226 except in accordance with 10 CFR Part 110;
  4. Dispose of products containing radium-226 at a disposal facility authorized to dispose of radioactive material in accordance with any Federal or State solid or hazardous waste law, including the Solid Waste Disposal Act, as authorized under the Energy Policy Act of 2005, by transfer to a person authorized to receive radium-226 by a specific license issued under this Chapter, or equivalent regulations of the NRC or an Agreement State, or as otherwise approved by the NRC or an Agreement State; and
  5. Respond to written requests from the Division to provide information relating to the general license within thirty (30) calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by providing the Division, by an appropriate method listed in 10 CFR 30.6(a), a written justification for the request.
- (d) The general license in subparagraph (a) of this paragraph does not authorize the manufacture, assembly, disassembly, repair, or import of products containing radium-226, except that timepieces may be disassembled and repaired.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-10-.11 Filing of Application for Specific Licenses is amended by deleting the Rule in its entirety and substituting the following so that, as amended, Rule 1200-02-10-.11 shall read as follows:

1200-02-10-.11 Filing of Application for Specific Licenses.

- (1) Application for specific licenses shall be filed in duplicate on a form prescribed by the Division.
- (2) The Division may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Division to determine whether the application should be granted or denied or whether a license should be modified or revoked.
- (3) Each application shall be signed by the applicant or licensee or a person duly authorized to act for and on his behalf.
- (4) An application for a license may include a request for a license authorizing one or more activities.

- (5) In his application, the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Division provided such references are specific.
- (6) Applications and documents submitted to the Division may be made available for public inspection except that the Division may withhold any document or part thereof from public inspection if disclosure of its contents involves proprietary information.
- (7) An application for a specific license to use radioactive material in the form of a sealed source or in a device that contains the sealed source shall either:
  - (a) Identify the source or device by manufacturer and model number as registered with the NRC under 10 CFR 32.210 or with an Agreement State or for a source or a device containing radium-226 or accelerator-produced radioactive material with an Agreement State under provisions comparable to 10 CFR 32.210; or
  - (b) Contain the information identified in 10 CFR 32.210(c).
  - (c) For sources or devices containing naturally occurring or accelerator produced radioactive material manufactured prior to November 30, 2007 that are not registered with the NRC under 10 CFR 32.210 or with an Agreement State, and for which the applicant is unable to provide all categories of information specified in 10 CFR 32.210(c), the applicant must provide:
    - 1. All available information identified in 10 CFR 32.210(c) concerning the source, and, if applicable, the device; and
    - 2. Sufficient additional information to demonstrate that there is reasonable assurance that the radiation safety properties of the source or device are adequate to protect health and minimize danger to life and property. Such information must include a description of the source or device, a description of radiation safety features, the intended use and associated operating experience, and the results of a recent leak test.
- (8) An application from a medical facility, educational institution, or Federal facility to produce Positron Emission Tomography (PET) radioactive drugs for noncommercial transfer to licensees in its consortium authorized for medical use under Chapter 1200-02-07 or equivalent Agreement State requirements shall include:
  - (a) A request for authorization for the production of PET radionuclides or evidence of an existing license issued under this Chapter or Agreement State requirements for a PET radionuclide production facility within its consortium from which it receives PET radionuclides;
  - (b) Evidence that the applicant is qualified to produce radioactive drugs for medical use by meeting one of the criteria in Rule 1200-02-10-.13(10)(a)2;
  - (c) Identification of individual(s) authorized to prepare the PET radioactive drugs if the applicant is a pharmacy, and documentation that each individual meets the requirements of an authorized nuclear pharmacist as specified in Rule 1200-02-10-.13(10)(b)2; and
  - (d) Information identified in Rule 1200-02-10-.13(10)(a)3 on the PET drugs to be noncommercially transferred to members of its consortium.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Paragraph (10) of Rule 1200-02-10-.13 Special Requirements for Issuance of Specific Licenses is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (10) shall read as follows:

- (10) Manufacture, preparation or transfer for commercial distribution of radiopharmaceuticals containing radioactive material for medical use.
  - (a) An application for a specific license to manufacture, prepare, or transfer for commercial

distribution radiopharmaceuticals containing radioactive material for use by persons authorized pursuant to Chapter 1200-02-07 will be approved if:

1. The applicant satisfies the general requirements specified in Rule 1200-02-10-.12;
  2. The applicant submits evidence that the applicant is at least one of the following:
    - (i) Registered or licensed with the U.S. Food and Drug Administration (FDA) as the owner or operator of a drug establishment that engages in the manufacture, preparation, propagation, compounding, or processing of a drug under 21 CFR 207.20(a);
    - (ii) Registered or licensed with a state agency as a drug manufacturer; or
    - (iii) Licensed as a pharmacy by the Tennessee Board of Pharmacy;
    - (iv) Operating as a nuclear pharmacy within a Federal medical institution; or
    - (v) A Positron Emission Tomography (PET) drug production facility registered with a state agency.
  3. The applicant submits information on the radionuclide; chemical and physical form; packaging including maximum activity per vial, syringe, generator or other container of the radioactive drug; and shielding provided by the packaging of the radioactive material for safe handling and storage of radiopharmaceuticals by medical use licensees; and
  4. The applicant satisfies the following labeling requirements:
    - (i) A label is affixed to each transport radiation shield, whether it is constructed of lead, glass, plastic or other material, of a radioactive drug to be transferred for commercial distribution. The label shall include the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL"; the name of the radioactive drug or its abbreviation; and the quantity of radioactivity at a specified date and time. For radioactive drugs with a half-life greater than one hundred (100) days, the time may be omitted.
    - (ii) A label is affixed to each syringe, vial or other container used to hold a radioactive drug to be transferred for commercial distribution. The label shall include the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL" and an identifier that ensures that the syringe, vial or other container can be correlated with the information on the transport radiation shield label.
- (b) A licensee described by subpart (a)2(iii) of this paragraph:
1. May prepare radiopharmaceuticals for medical use, as defined in subparagraph Rule 1200-02-07-.05, provided that the radiopharmaceuticals are prepared by either an authorized nuclear pharmacist, as specified in parts 2 and 4 of this subparagraph, or an individual under the supervision of an authorized nuclear pharmacist as specified in Rule 1200-02-07-.19.
  2. May allow a pharmacist to work as an authorized nuclear pharmacist if:
    - (i) This individual qualifies as an authorized nuclear pharmacist as defined in subparagraph Rule 1200-02-07-.05(4),
    - (ii) This individual meets the requirements specified in Rule 1200-02-07-.25(2) and Rule 1200-02-07-.27, and the licensee has received an approved license amendment identifying this individual as an authorized nuclear pharmacist; or

- (iii) This individual is designated as an authorized nuclear pharmacist in accordance with part 4 of this subparagraph.
  3. The actions authorized in parts 1 and 2 of this subparagraph are permitted in spite of more restrictive language in license conditions.
  4. May designate a pharmacist (as defined in ~~paragraph 1200-02-07-.05(23)~~ Rule 1200-02-07-.05(24)) as an authorized nuclear pharmacist if: ~~the individual is identified as of {April 18, 2002}, as an 'authorized user' on a nuclear pharmacy license issued by the Division under this chapter.~~
    - (i) The individual was a nuclear pharmacist preparing only radioactive drugs containing accelerator-produced radioactive material; and
    - (ii) The individual practiced at a pharmacy at a Government agency or Federally recognized Indian Tribe before November 30, 2007 or at all other pharmacies before August 8, 2009, or an earlier date as noticed by the NRC.
  5. Shall provide to the Division a copy of each individual's:
    - (i) Certification by a specialty board whose certification process has been recognized by the Division, U.S. Nuclear Regulatory Commission or an Agreement State as specified in Rule 1200-02-07-.25(1) with the written attestation signed by a preceptor as required by Rule 1200-02-07-.25(2)(b); or
    - (ii) The Division, U.S. Nuclear Regulatory Commission or other Agreement State license; or
    - (iii) ~~The permit issued by a licensee of broad scope; and~~ NRC master materials licensee permit; or
    - (iv) ~~State pharmacy licensure or registration, no later than 30 days after the date that the licensee allows, pursuant to subparts 2(i) and (iii) of this subparagraph, the individual to work as an authorized nuclear pharmacist.~~ The permit issued by a licensee or NRC master materials permittee of broad scope or the authorization from a commercial nuclear pharmacy authorized to list its own authorized nuclear pharmacist; or
    - (v) Documentation that only accelerator-produced radioactive materials were used in the practice of nuclear pharmacy at a Government agency or Federally recognized Indian Tribe before November 30, 2007 or at all other locations of use before August 8, 2009, or an earlier date as noticed by the NRC; and
    - (vi) A copy of the state pharmacy licensure or registration, no later than 30 days after the date that the licensee allows, the individual to work as an authorized nuclear pharmacist under subparts 2(i) and (iii) of this subparagraph.
- (c) A licensee shall possess and use instrumentation to measure the radioactivity of radioactive drugs. The licensee shall have procedures for use of the instrumentation. The licensee shall measure by direct measurement or by combination of measurements and calculations, the amount of radioactivity in dosages of alpha-, beta-, or photon-emitting radioactive drugs before transfer for commercial distribution. In addition, the licensee shall:
  1. Perform tests before initial use, periodically and following repair, on each instrument for accuracy, linearity and geometry dependence, as appropriate for the use of the instrument; and make adjustments when necessary; and
  2. Check each instrument for constancy and proper operation at the beginning of each day of use.

- (d) Nothing in this rule relieves the licensee from complying with applicable FDA, other Federal and State requirements governing radioactive drugs.

Paragraph (13) of Rule 1200-02-10-.13 Special Requirements for Issuance of Specific Licenses is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (13) shall read as follows:

- (13) Manufacture and distribution of radioactive material for certain in vitro clinical or laboratory testing under general license. In addition to the requirements set forth in Rule 1200-02-10-.12, a specific license to manufacture or distribute radioactive material for use under the general license of Rule 1200-02-10-.10(7) will be issued only if:
- (a) The radioactive material is to be prepared for distribution in prepackaged units of:
1. Iodine-125 in units not exceeding 10 microcuries each.
  2. Iodine-131 in units not exceeding 10 microcuries each.
  3. Carbon-14 in units not exceeding 10 microcuries each.
  4. Hydrogen-3 (tritium) in units not exceeding 50 microcuries each.
  5. Iron-59 in units not exceeding 20 microcuries each.
  6. Cobalt-57 in units not exceeding 10 microcuries each.
  7. Selenium-75 in units not exceeding 10 microcuries each.
  8. Mock Iodine-125 in units not exceeding 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each.
- (b) Each prepackaged unit bears a durable, clearly visible label:
1. Identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed 10 microcuries of iodine-131, iodine-125, cobalt-57, selenium-75, or carbon-14; 50 microcuries of hydrogen-3 (tritium); 20 microcuries of iron-59; or Mock Iodine-125 in units not exceeding 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each; and
  2. Displaying the radiation caution symbol described in Rule 1200-02-05-.110 and the words, "Caution, Radioactive Material" and "Not for Internal or External Use in Humans or Animals."
- (c) ~~One of~~ The following statements, ~~as appropriate,~~ or a substantially similar statement which contains the information called for in ~~one of~~ the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:
1. This radioactive material may be received, acquired, possessed and used only by physicians, veterinarians in the practice of veterinary medicine, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation there from, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of the U.S. Nuclear Regulatory Commission or of a state with which the Commission has entered into an agreement for the exercise of regulatory authority.

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(Name of Manufacturer)

- ~~2. This radioactive material may be received, acquired, possessed and used only by physicians, veterinarians in the practice of veterinary medicine, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external~~

~~administration of the material, or the radiation there from, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of a Licensing State.~~

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(Name of Manufacturer)

- (d) The label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling and storing such radioactive material. In the case of the Mock Iodine-125 reference or calibration source, the information accompanying the source must also contain directions to the licensee regarding the waste disposal requirements set out in Rule 1200-02-05-.120.

Paragraph (15) of Rule 1200-02-10-.13 Special Requirements for Issuance of Specific Licenses is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (15) shall read as follows:

- (15) Incorporation of naturally occurring and accelerator-produced radioactive material into gas and aerosol detectors. An application for a specific license authorizing the incorporation of NARM into gas and aerosol detectors to be distributed to persons exempt under ~~1200-02-10-.04(2)(i)~~ Rule 1200-02-10-.04(2)(a)9 will be approved if the application satisfies requirements equivalent to those contained in Section 32.26 of 10 CFR Part 32. The maximum quantity of radium-226 in each device shall not exceed 0.1 microcurie.

Paragraph (16) of Rule 1200-02-10-.13 Special Requirements for Issuance of Specific Licenses is amended by deleting the paragraph and substituting the following so that, as amended, paragraph (16) shall read as follows:

- (16) Special requirements for License to Manufacture or initially transfer of calibration sources containing americium-241, plutonium or radium-226 for distribution to persons generally licensed under Rule 1200-02-10-.10(4). ~~In addition to the requirements set forth in 1200-02-10-.12, a specific license to manufacture calibration and reference sources containing americium-241, plutonium or radium-226 to persons generally licensed under 1200-02-10-.10(4) will be issued only if the requirements of Sections 32.57, 32.58, 32.59, and 32.102 of 10 CFR Part 32 and Section 70.39 of 10 CFR Part 70 or their equivalent are met.~~

- (a) An application for a specific license to manufacture or initially transfer calibration or reference sources containing americium-241, plutonium, or radium-226 for distribution to persons generally licensed under Rule 1200-02-10-.10(4) will be approved if:
1. The applicant satisfies the general requirement of Rule 1200-02-10-.12; and
  2. The applicant submits sufficient information regarding each type of calibration or reference source pertinent to evaluation of the potential radiation exposure, including:
    - (i) Chemical and physical form and maximum quantity of americium 241, plutonium or radium-226 in the source;
    - (ii) Details of construction and design;
    - (iii) Details of the method of incorporation and binding of the americium-241, plutonium or radium-226 in the source;
    - (iv) Procedures for and results of prototype testing of sources, which are designed to contain more than 185 Bq (0.005  $\mu$ Ci) of americium-241, plutonium or radium-226, to demonstrate that the americium-241, plutonium or radium-226 contained in each source will not be released or be removed from the source under normal conditions of use;
    - (v) Details of quality control procedures to be followed in manufacture of the source;
    - (vi) Description of labeling to be affixed to the source or the storage container for the source; and

- (vii) Any additional information, including experimental studies and tests, required by the Division to facilitate a determination of the safety of the source.
3. Each source will contain no more than 185 kBq (5  $\mu$ Ci) of americium-241, plutonium or radium-226.
4. The Division determines, with respect to any type of source containing more than 185 Bq (0.005  $\mu$ Ci) of americium-241, plutonium or radium-226, that:
  - (i) The method of incorporation and binding of the americium-241, plutonium or radium-226 in the source is such that the americium-241, plutonium or radium-226 will not be released or be removed from the source under normal conditions of use and handling of the source; and
  - (ii) The source has been subjected to and has satisfactorily passed the prototype tests prescribed by subparagraph (b) of this paragraph.
- (b) Schedule C- prototype tests for calibration or reference sources containing americium-241, plutonium or radium-226. An applicant for a license pursuant to subparagraph (a) of this paragraph shall conduct prototype tests for any type of source which is designed to contain more than 185 Bq (0.005  $\mu$ Ci) of americium-241, plutonium or radium-226, in the order listed, on each of five prototypes of such source, which contains more than 185 Bq (0.005  $\mu$ Ci) of americium-241, plutonium or radium-226, as follows:
  1. Initial measurement. The quantity of radioactive material deposited on the source shall be measured by direct counting of the source.
  2. Dry wipe test. The entire radioactive surface of the source shall be wiped with filter paper with the application of moderate finger pressure. Removal of radioactive material from the source shall be determined by measuring the radioactivity on the filter paper or by direct measurement of the radioactivity on the source following the dry wipe.
  3. Wet wipe test. The entire radioactive surface of the source shall be wiped with filter paper, moistened with water, with the application of moderate finger pressure. Removal of radioactive material from the source shall be determined by measuring the radioactivity on the filter paper after it has dried or by direct measurement of the radioactivity on the source following the wet wipe.
  4. Water soak test. The source shall be immersed in water at room temperature for a period of twenty four (24) consecutive hours. The source shall then be removed from the water. Removal of radioactive material from the source shall be determined by direct measurement of the radioactivity on the source after it has dried or by measuring the radioactivity in the residue obtained by evaporation of the water in which the source was immersed.
  5. Dry wipe test. On completion of the preceding test in part 4 of this subparagraph, the dry wipe test described in part 2 of this subparagraph shall be repeated.
  6. Observations. Removal of more than 185 Bq (0.005  $\mu$ Ci) of radioactivity in any test prescribed by this subparagraph shall be cause for rejection of the source design. Results of prototype tests submitted to the Division shall be given in terms of radioactivity in microcuries and percent of removal from the total amount of radioactive material deposited on the source.
- (c) Labeling of devices. Each person licensed under subparagraph (a) of this paragraph shall affix to each source, or storage container for the source, a label which shall contain sufficient information relative to safe use and storage of the source and shall include the following statement or a substantially similar statement which contains the information called for in the following statement:

The receipt, possession, use and transfer of this source, Model \_\_\_, Serial No. \_\_\_ are subject to a general license and the regulations of the NRC or an Agreement State. Do not remove this label.

CAUTION--RADIOACTIVE MATERIAL--  
THIS SOURCE CONTAINS AMERICIUM-241 [PLUTONIUM OR RADIUM-226].  
DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

Name of manufacturer or initial transferor

- (d) Leak testing of each source. Each person licensed under subparagraph (a) of this paragraph shall perform a dry wipe test upon each source containing more than 3.7 kBq (0.1 µCi) of americium-241, plutonium or radium 226 prior to transferring the source to a general licensee under Rule 1200-02-10-10(4). This test shall be performed by wiping the entire radioactive surface of the source with a filter paper with the application of moderate finger pressure. The radioactivity on the paper shall be measured by using radiation detection instrumentation capable of detecting 185 Bq (0.005 µCi) of americium-241, plutonium, or radium-226. If any such test discloses more than 185 Bq (0.005 µCi) of radioactive material, the source shall be deemed to be leaking or losing americium-241, plutonium or radium-226 and shall not be transferred to a general licensee under Rule 1200-02-10-10(4) or equivalent regulations of the NRC or an Agreement State.

Table 7-2 of Rule 1200-02-10-13 Special Requirements for Issuance of Specific Licenses is amended by deleting the table in its entirety and substituting the following so that, as amended, Table 7-2 will read as follows:

Table RHS 7-2 Quantities of radioactive materials requiring consideration of the need for an emergency plan for responding to a release.

Radioactive material <sup>1</sup>	Release fraction	Quantity (curies)	Radioactive material <sup>1</sup>	Release fraction	Quantity (curies)
Actinium-228	0.001	4,000	Gold-198	0.01	30,000
Americium-241	0.001	2	Hafnium-172	0.01	400
Americium-242	0.001	2	Hafnium-181	0.01	7,000
Americium-243	0.001	2	Holmium-166m	0.01	100
Antimony-124	0.01	4,000	Hydrogen-3	0.5	20,000
Antimony-126	0.01	6,000	Iodine-125	0.5	10
Barium-133	0.01	10,000	Iodine-131	0.5	10
Barium-140	0.01	30,000	Indium-114m	0.01	1,000
Bismuth-207	0.01	5,000	Iridium-192	0.001	40,000
Bismuth-210	0.01	600	Iron-55	0.01	40,000
Cadmium-109	0.01	1,000	Iron-59	0.01	7,000
Cadmium-113	0.01	80	Krypton-85	1.0	6,000,000
Calcium-45	0.01	20,000	Lead-210	0.01	8
Californium-252	0.001	9 (20 mg)	Manganese-56	0.01	60,000
Carbon-14	0.01	50,000	Mercury-203	0.01	10,000
	Non-CO		Molybdenum-99	0.01	30,000
Cerium-141	0.01	10,000	Neptunium-237	0.001	2
Cerium-144	0.01	300	Nickel-63	0.01	20,000
Cesium-134	0.01	2,000	Niobium-94	0.01	300
Cesium-137	0.01	3,000	Phosphorus-32	0.5	100
Chlorine-36	0.5	100	Phosphorus-33	0.5	1,000
Chromium-51	0.01	300,000	Polonium-210	0.01	10
Cobalt-60	0.001	5,000	Potassium-42	0.01	9,000
Copper-64	0.01	200,000	Promethium-145	0.01	4,000
Curium-242	0.001	60	Promethium-147	0.01	4,000
Curium-243	0.001	3	Radium-226	0.001	100
Curium-244	0.001	4	Ruthenium-106	0.01	200
Curium-245	0.001	2	Samarium-151	0.01	4,000
Europium-152	0.01	500	Scandium-46	0.01	3,000
Europium-154	0.01	400	Selenium-75	0.01	10,000
Europium-155	0.01	3,000	Silver-110m	0.01	1,000
Germanium-68	0.01	2,000	Sodium-22	0.01	9,000
Gadolinium-153	0.01	5,000	Sodium-24	0.01	10,000

Strontium-89	0.01	3,000	Zinc-65	0.01	5,000
Strontium-90	0.01	90	Zirconium-93	0.01	400
Sulfur-35	0.5	900	Zirconium-95	0.01	5,000
Technetium-99	0.01	10,000	Any other beta-gamma emitter	0.01	10,000
Technetium-99m	0.01	400,000	Mixed fission products	0.01	1,000
Tellurium-127m	0.01	5,000	Mixed corrosion products	0.01	10,000
Tellurium-129m	0.01	5,000	Contaminated equipment beta-gamma	0.001	10,000
Terbium-160	0.01	4,000	Irradiated material, any form other than solid noncombustible	0.01	1,000
Thulium-170	0.01	4,000	Irradiated material, solid noncombustible	0.001	10,000
Tin-113	0.01	10,000	Mixed radioactive waste, beta-gamma	0.01	1,000
Tin-123	0.01	3,000	Packaged mixed waste, beta-gamma <sup>2</sup>	0.001	10,000
Tin-126	0.01	1,000	Any other alpha emitter	0.001	2
Titanium-44	0.01	100	Contaminated equipment, alpha	0.0001	20
Vanadium-48	0.01	7,000	Packaged waste, alpha <sup>2</sup>	0.0001	20
Xenon-133	1.0	900,000	Combinations of radioactive materials listed above <sup>1</sup>		
Yttrium-91	0.01	2,000			

<sup>1</sup> For combinations of radioactive materials, consideration of the need for an emergency plan is required if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed for that material in Table RHS 7-2 exceeds one.

<sup>2</sup> Waste packaged in Type B containers does not require an emergency plan.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-10-.16 Specific Terms and Conditions of Licenses is amended by deleting the Rule in its entirety and substituting the following so that, as amended, Rule 1200-02-10-.16 shall read as follows:

- (1) Each license issued pursuant to this Chapter shall be subject to all provisions of the Act, now or hereafter in effect, and to all rules, regulations, and orders of the Division.
- (2) Neither the license nor any right under the license shall be assigned or otherwise transferred in violation of the provisions of the Act.
- (3) Each person licensed by the Division pursuant to this Chapter shall confine his use and possession of the material licensed to the locations and purposes authorized in the license.
- (4) Each licensee authorized under Rule 1200-02-10-.13(5) to distribute certain devices to generally licensed persons shall:
  - (a) Report to the Division within thirty (30) days after the end of each calendar quarter all transfers of such devices to persons generally licensed under Rule 1200-02-10-.10(2) or, if no transfers have been made during the reporting period, the report shall so indicate. For all transfers the report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Division and the general licensee, the type and model number of device transferred and the quantity and type of radioactive material contained in the device; and
  - (b) Furnish to each general licensee in this State to whom he transfers such device a copy of the general license contained in Rule 1200-02-10-.10(2).
- (5) Each specific licensee shall notify the Division in writing when the licensee decides to permanently discontinue all activities involving radioactive materials authorized under the license.
- (6) Each licensee preparing technetium-99m radiopharmaceuticals from molybdenum-99/technetium-99m generators or rubidium-82 from strontium-82/rubidium-82 generators shall test the generator eluates for molybdenum-99 breakthrough or strontium-82 and strontium-85 contamination, respectively, in accordance with Rule 1200-02-07-.41. The licensee shall record the results of each test and retain each record for three (3) years after the record is made.
- (7) Each specific licensee and each general licensee meeting the criteria of ~~part~~ Rule 1200-02-10-.10(2)(c)14 shall:
  - (a) Provide the Division written notification, at the address in Rule 1200-02-04-.07, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any Chapter of Title 11 (Bankruptcy) of the United States Code (U.S.C.):
    1. By or against the licensee;
    2. By or against an entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or
    3. By or against an affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee;
  - (b) Include in the notification required in subparagraph ~~(7)~~(a) of this rule paragraph the bankruptcy court in which the petition for bankruptcy was filed; and
  - (c) Include in the notification required in subparagraph ~~(7)~~(a) of this rule paragraph the date of the filing of the petition.

- (8) When temporary job-sites are authorized on a specific license, radioactive material may be used at temporary job-sites, in areas not under exclusive federal jurisdiction, throughout the State of Tennessee.
- (9) Each portable gauge licensee shall use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges are not under the control and constant surveillance of the licensee.
- (10)
  - (a) Authorization under Rule 1200-02-10-.11(8) to produce Positron Emission Tomography (PET) radioactive drugs for noncommercial transfer to medical use licensees in its consortium does not relieve the licensee from complying with applicable FDA, other Federal, and Agreement State requirements governing radioactive drugs.
  - (b) Each licensee authorized under Rule 1200-02-10-.11(8) to produce PET radioactive drugs for noncommercial transfer to medical use licensees in its consortium shall:
    - 1. Satisfy the labeling requirements in Rule 1200-02-10-.13(10)(a)4 for each PET radioactive drug transport radiation shield and each syringe, vial, or other container used to hold a PET radioactive drug intended for noncommercial distribution to members of its consortium; and
    - 2. Possess and use instrumentation to measure the radioactivity of the PET radioactive drugs intended for noncommercial distribution to members of its consortium and meet the procedural, radioactivity measurement, instrument test, instrument check, and instrument adjustment requirements in Rule 1200-02-10-.13(10)(c).
  - (c) A licensee that is a pharmacy authorized under Rule 1200-02-10-.11(8) to produce PET radioactive drugs for noncommercial transfer to medical use licensees in its consortium shall require that any individual that prepares PET radioactive drugs shall be:
    - 1. An authorized nuclear pharmacist that meets the requirements in Rule 1200-02-10-.13(10)(b)2, or
    - 2. An individual under the supervision of an authorized nuclear pharmacist as specified in Rule 1200-02-07-.19.
  - (d) A pharmacy, authorized under Rule 1200-02-10-.11(8) to produce PET radioactive drugs for noncommercial transfer to medical use licensees in its consortium that allows an individual to work as an authorized nuclear pharmacist, shall meet the requirements of Rule 1200-02-10-.13(10)(b)5.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Rule 1200-02-10-.29 Reciprocal Recognition of Licenses is amended by adding paragraphs (4) and (5) to read as follows:

- (4) Before radioactive materials can be used at a temporary job site within the State at any Federal facility, the jurisdictional status of the job site shall be determined. If the jurisdictional status is unknown, the Federal agency should be contacted to determine if the job site is under exclusive Federal jurisdiction.
  - (a) In areas of exclusive Federal jurisdiction, the general license is subject to all the applicable rules, regulations, orders and fees of the NRC, and
  - (b) Authorizations for use of radioactive materials at job sites under exclusive Federal jurisdiction shall be obtained from the NRC by either:
    - 1. Filing a NRC Form-241 in accordance with 10 CFR 150.20(b); or
    - 2. By applying for a specific NRC license.

- (5) Before radioactive material can be used at a temporary job site in another State, authorization shall be obtained for the State if it is an Agreement State, or from the NRC for any non-Agreement State, either by filing for reciprocity or applying for a specific license.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

Chapter 1200-02-11  
Licensing Requirements for Land Disposal of Radioactive Waste

Amendments

Subparagraph (c) of paragraph (1) of Rule 1200-02-11-.14 Transfer of License is amended by adding the words ", required by Rule 1200-02-11-.19(1)(e) and (f)," between the words "care" and "will" so that, as amended, subparagraph (c) shall read as follows:

- (c) That any funds and necessary records for care, required by Rules 1200-02-11-.19(1)(e) and (f), will be transferred to the disposal site owner;

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Commissioner on \_\_\_\_\_, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 12/20/10

Rulemaking Hearing(s) Conducted on: (add more dates). 02/22/11

Date: 6-2-11

Signature: Robert J. Martineau

Name of Officer: Robert J. Martineau, Jr.

Title of Officer: Commissioner



Subscribed and sworn to before me on: June 2, 2011

Notary Public Signature: Freda Crutchfield

My commission expires on: May 8, 2012

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.

Robert E. Cooper, Jr.  
Attorney General and Reporter  
8-26-11

Date

**Department of State Use Only**

Filed with the Department of State on: 9/9/11

Effective on: 10/8/11

Tre Hargett by Mona Hart, POA

Tre Hargett  
Secretary of State

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**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: Environment and Conservation  
DIVISION: Resource Management  
SUBJECT: Rare Plant Protection and Conservation  
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 70-8-301 et seq.  
EFFECTIVE DATES: December 25, 2011 through June 30, 2012  
FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

This rulemaking includes modifications to Chapter 0400-06-02, *Rare Plant Protection and Conservation Regulations*, that remove some plants from the list, add some plants to the list and correct scientific names for some plants on the list.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

No one attended the Public Rulemaking Hearing. No Comments were received at the hearing or during the public comment period following the hearing which ended at 4:30 p.m. CDT March 4, 2011.

### Regulatory Flexibility Addendum

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

- (1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule.

There are approximately 9 rare plant dealer licenses issued each year at no cost to the dealer.

- (2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record.

The licensees are required to report the number of rare plants that they sell and the number they acquire. Typically this amounts to recording 6 numbers or less for each dealer. There are no new recordkeeping or reporting requirements or administrative costs contained in the amendment to rule 0400-06-02-.02.

- (3) A statement of the probable effect on impacted small businesses and consumers.

The amendment to rule 0400-06-02-.02 will have little effect on small businesses due to the fact that very few nurseries sell native plants and those plants that are listed are for the most part very obscure species that are not popular in cultivation.

- (4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business.

The amendment to rule 0400-06-02-.02 affects only a very small fraction of the nursery industry at present and the burden consists of one form to fill out each year. Any measures less burdensome would not achieve the purpose of the rule.

- (5) A comparison of the proposed rule with any federal or state counterparts.

The Endangered Species Act of 1973 (16 U.S.C. 1531-1544) is much more stringent and comprehensive than the amendment to rule 0400-06-02-.02. The federal law covers fewer plant species in Tennessee but the regulations are more restrictive.

- (6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

All of the nurseries that are subject to the reporting requirements would likely qualify as small businesses and their exemption from this rule would defeat the purpose of the rule.

### **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule to proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Department does not anticipate that these amended rules will have a financial impact on local governments.

**Department of State  
Division of Publications**

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**For Department of State Use Only**

Sequence Number: 09-22-11  
Rule ID(s): 5026  
File Date: 09/26/2011  
Effective Date: 12/25/2011

## Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

<b>Agency/Board/Commission:</b>	Environment and Conservation
<b>Division:</b>	Resource Management Division
<b>Contact Person:</b>	Todd Crabtree
<b>Address:</b>	7 <sup>th</sup> Floor, L & C Annex 401 Church Street Nashville, Tennessee
<b>Zip:</b>	37243-0447
<b>Phone:</b>	(615) 532-1378
<b>Email:</b>	Todd.Crabtree@tn.gov

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
0400-06-02	Rare Plant Protection and Conservation Regulations
Rule Number	Rule Title
0400-06-02-.03	Promulgation of Lists
0400-06-02-.04	List of Endangered Species

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://tn.gov/sos/rules/1360/1360.htm>)

Chapter 0400-06-02  
Rare Plant Protection and Conservation Regulations

Amendment

Paragraph (6) of Rule 0400-06-02-.03 Promulgation of Lists is amended by deleting it in its entirety and replacing it with the following paragraph (6) to read as follows:

- (6) Copies of the current list of endangered species or the list of threatened or special concern species shall be made available, upon request, by the Department of Environment and Conservation, ~~Division of Natural Areas~~ Resource Management Division, 401 Church Street, Nashville, Tennessee 37243-0447.

Rule 0400-06-02-.04 List of Endangered Species is amended by deleting it in its entirety and replacing it with the following new Rule 0400-06-02-.04 to read as follows:

0040-06-02-.04 List of Endangered Species.

The endangered plant list of Tennessee includes the following:

Latin Name	Common Name
<i>Aconitum reclinatum</i> A.	Gray trailing wolfsbane
<i>Agalinis auriculata</i> (Michx.)	Blake Earleaved false-foxglove
<i>Agalinis heterophylla</i> (Nutt.) Small ex Britton	Prairie False Foxglove
<i>Agalinis oligophylla</i> Pennell	Ridge-stem false foxglove
<i>Agalinis plukenetii</i> (Ell.) Raf	Purple gerardia
<i>Allium stellatum</i> Fraser	Glade onion
<i>Anemone canadensis</i> L.	Canada anemone
<i>Anemone caroliniana</i> Walt.	Carolina anemone
<i>Apios priceana</i> Robbins	Price's potato-bean
<i>Arabis patens</i> Sullivan	Spreading rockcress
<i>Arabis perstellata</i> L. Braun	Braun's rockcress
<i>Arenaria lanuginosa</i> (Michx.) Rohrback	Woolly sandwort
<i>Aristida ramosissima</i> Engelm. ex Gray	Branched three-awn grass
<i>Asplenium scolopendrium</i> L. var. <i>americanum</i> (Fern.) Kartesz & Gandhi	Hart's-tongue fern
<i>Astilbe crenatiloba</i> (Britt.) Small	Crenate-lobed false goat's-beard
<i>Astragalus bibullatus</i> Barneby and Bridges	Pyne's ground-plum
<i>Betula papyrifera</i> Marsh var. <i>cordifolia</i> (Regel) Fern.	Heart-leaved paper birch
<i>Brachydontium trichodes</i> (Web.) Milde	Peak moss
<i>Bulbostylis ciliatifolia</i> (Ell.) Fern. var. <i>coarctata</i> (Ell.) Kral	Capillary hairsedge
<i>Calamagrostis cainii</i> Hitchcock	Cain's reedgrass
<i>Calamagrostis porteri</i> A. Gray	Porter's reedgrass
<del><i>Calamovilfa arcuata</i> K.E. Rogers</del>	<del>Cumberland sandgrass</del>
<i>Calopogon oklahomensis</i> D.H. Goldman	Oklahoma grass-pink
<i>Caltha palustris</i> L.	Marsh marigold
<i>Carex alopecoidea</i> Tuckerm.	Foxtail sedge
<i>Carex barrattii</i> Schweinitz and Torr.	Barratt's sedge
<i>Carex buxbaumii</i> Wahlenb.	Buxbaum's Sedge
<i>Carex canescens</i> L. ssp. <i>disjuncta</i> Fern.	Hoary Sedge
<i>Carex lonchocarpa</i> Willd. ex Spreng.	Southern Long Sedge
<i>Carex manhartii</i> Bryson	Manhart's sedge
<i>Carex muskingumensis</i> Schweinitz	Muskingum sedge

Carex pellita Willd.	Woolly sedge
Carex roanensis Hermann	Roan mountain sedge
Carex sterilis Willd.	Sterile sedge
Carex, utriculata Boott.	Northwest Territory sedge
Carex vestita Willd.	Velvety sedge
Cephaloziella messalongi (Spruce) K. Muell.	a liverwort
Cerastium velutinum Raf.	Velvety cerastium
Clematis fremontii S. Wats.	Fremont's Leather Flower
Clematis glaucophylla Small	White-leaved leatherflower
Clematis morefieldii Kral	Huntsville vasevine
Clethra alnifolia L.	coastal pepperbush
Coeloglossum viride (L.) Hartman	Long-bracted green orchis
var. virescens (Muhl. ex Willd.) Luer	
Collinsia verna Nutt.	Spring blue-eyed Mary
Comptonia peregrina (L.) Coulter	Sweet-fern
Coreopsis latifolia Michx.	Broad-leaved tickseed
Coreopsis delphinifolia Lam.	Larkspur-leaved coreopsis
Corydalis sempervirens (L.) Pers.	Pale corydalis
Crataegus harbisonii Beadle	Harbison's hawthorn
Crotalaria purshii DC.	Pursh's rattlebox
<del>Croton alabamensis E.A. Smith</del>	<del>Alabama croton</del>
Cypripedium kentuckiense Reed	Southern lady's-slipper
Cypripedium reginae Walt.	Showy lady's-slipper
Dalea foliosa (A. Gray) Barneby	Leafy prairie-clover
Dalea purpurea Vent.	Purple prairie-clover
Delphinium exaltatum Ait.	Tall larkspur
Desmodium ochroleucum M.A. Curtis ex Canby	Creamflower tick-trefoil
Diamorpha smallii Britt.	Small's stonecrop
<del>Dichantherium aciculare (Desv. ex Poir.)</del>	<del>Needleleaf witchgrass</del>
<del>    Gould &amp; C.A. Clark</del>	
Dichantherium acuminatum subsp. spretum	Eaton's witchgrass
(Schult.) Freckmann & Lelong	
Dichantherium ensifolium subsp. curtifolium	Short-leaved panic grass
(Nash) Freckmann & Lelong	
Echinacea pallida (Nutt.) Nutt.	Pale Purple Coneflower
Echinacea tennesseensis (Beadle) Small	Tennessee coneflower
Eleocharis equisetoides (Ell.) Torr.	Horse-tail spike-rush
Eleocharis intermedia J.A. Schultes	matted spike rush
Eleocharis wolfii A. Gray	Wolf's spike rush
Elymus svensonii Church	Svenson's wild-rye
Eriocaulon decangulare L.	Ten-angle pipewort
Eriogonum longifolium Nutt.	Harper's umbrella-plant
var. harperi (Goodm.) Reveal	
Eriophorum virginicum L.	tawny cotton grass
Erysimum capitatum (Dougl.) Greene	Western wallflower
Eupatorium leucolepis (DC.) Torr. and A. Gray	White-bracted thoroughwort
Eurybia saxicastelli (J. J. N. Campbell & Medley)	Rockcastle aster
G. L. Nesom	
Euthamia gymnospermoides Green	Great Plains Goldentop
Fimbristylis perpusilla Harper	Harper's fimbriatylis
Frullania appalachiana R. M. Schust.	a liverwort
Gentiana puberulenta J.S. Pringle	Prairie gentian
Geum aleppicum Jacq.	Yellow Avens
Geum geniculatum Michx.	Bent avens
Geum radiatum Michx.	Spreading avens
Gratiola floridana Nutt.	Florida hedge-hyssop
Hedyotis purpurea (L.) Torr. & A. Gray	Roan Mountain bluet
var. montana (Small) Fosberg	
Helenium brevifolium (Nutt.) Wood	Shortleaf sneezeweed

Helianthemum bicknellii Fern.	Plains frostweed
Helianthemum canadense (L.) Michx.	Canada frostweed
Helianthemum propinquum E.P. Bicknell	low frostweed
Helianthus verticillatus Small	Whorled sunflower
Homaliadelphus sharpii (Williams) Sharp	Sharp's homaliadelphus
Hydrocotyle americana L.	American water-pennywort
Hypericum adpressum Barton	Creeping St. John's-wort
Hypericum ellipticum Hook.	Pale St. John's-wort
Hypericum graveolens Bickl.	Mountain St. John's-wort
Iris brevicaulis Raf.	Lamance iris
Isoetes appalachiana D.F. Brunton & D.M. Britton	Appalachian Quillwort
Isoetes melanopoda Gay and Durieu	Blackfoot quillwort
Isoetes tennesseensis N.T. Luebke & J.M. Budke	Hiwassee quillwort
Isotria medeoloides (Pursh) Raf.	Small whorled pogonia
Juncus trifidus L. var. carolinianus Hamet-Ahti	Highland rush
Kalmia angustifolia L. var. carolina (Small) Fern.	Sheep-laurel
Lachnanthes carolina (Lam.)	Dandy Carolina redroot
Lachnocaulon anceps (Walt.) Morong	Bog-buttons
Leavenworthia exigua Rollins var. lutea Rollins	Pasture glade-cress
Lechea pulchella Raf.	Leggett's pinweed
Lejeunea sharpii (Schust.) Schust.	Sharp's lejeunia
Leptodontium viticulosoides var. sulphureum (Müller Hal.) R. H. Zander	Grandfather mountain leptodontium
Leptohymenium sharpii (Crum & Anders.) Buck & Crum	Mount Leconte moss
Leptoscyphus cuneifolius (Hook.) Mitt.	a liverwort
<del>Lesquerella globosa (Desv.) S. Watson</del>	<del>Short's bladderpod</del>
<del>Lesquerella perforata Rollins</del>	<del>Spring Creek bladderpod</del>
<del>Lesquerella stonensis Rollins</del>	<del>Stones River bladderpod</del>
Lilium grayi S. Wats.	Gray's lily
Lilium philadelphicum L.	Wood lily
Linnaea borealis L.	Twinflower
Listera australis Lindl.	Southern twayblade
Lonicera prolifera (Kirchner) Rehder	Grape honeysuckle
Lycopodium annotinum L.	Stiff clubmoss
Lysimachia fraseri Duby	Fraser's loosestrife
Lysimachia quadriflora Sims	Fourflower Yellow Loosestrife
Lysimachia terrestris (L.) BSP.	Swamp loosestrife
Maianthemum stellatum (L.) Link	Starflower false Solomon's-seal
Marshallia grandiflora Beadle and Boynton	Large-flowered Barbara's-buttons
Marsupella funkii (Web. & Mohr) Dumort.	a liverwort
Melanthium latifolium Desr.	Broadleaf bunchflower
Melanthium virginicum L.	Virginia bunchflower
Melanthium woodii (J.W. Robbins ex Wood) Bodkin	Ozark bunchflower
Minuartia cumberlandensis (Wofford & Kral) McNeill	Cumberland sandwort
Minuartia godfreyi (Shinners) McNeill	Godfrey's stitchwort
Minuartia groenlandica (Retzius) Ostenfeld	Mountain sandwort
Muhlenbergia cuspidata (Torr.) Rydb.	Plains muhly
Muhlenbergia torreyana (Shult.) Hitchcock	Torrey's dropseed
Myriophyllum pinnatum (Walt.) B.S.P.	Cutleaf Watermilfoil
Nestronia umbellula Raf.	Nestronia
Onosmodium hispidissimum Mack.	Shaggy false gromwell
Onosmodium molle Michx. ssp. subsetosum (Mack & Bush) Cochrane	Smooth false gromwell
Paxistima canbyi A. Gray	Canby's mountain-lover
Paysonia perforata (Rollins) O'Kane & Al-Shehbaz	Spring Creek Bladderpod
Paysonia stonensis (Rollins) O'Kane & Al-Shehbaz	Stones River Bladderpod
Perideridia americana (Nutt. ex DC.) Reichenb.	Thicket parsley
Physaria globosa (Desv.) O'Kane	Globe Bladderpod
Pityopsis ruthii (Small) Small	Ruth's golden-aster

<i>Plantago cordata</i> Lam.	Heart-leaved plantain
<i>Platanthera grandiflora</i> (Bigelow) Lindl.	Large purple fringed orchid
<i>Platanthera integra</i> (Nutt.) A. Gray ex Beck	Yellow fringeless orchid
<i>Platanthera integrilabia</i> (Correll) Luer	White fringeless orchid
<i>Platanthera nivea</i> (Nutt.) Luer	Snowy orchid
<i>Poa palustris</i> L.	owl bluegrass
<i>Pogonia ophioglossoides</i> (L.) Ker-Gawl.	Rose pogonia
<i>Polygala nana</i> (Michx.) DC.	Dwarf milkwort
<i>Polygala nuttallii</i> Torr. and A. Gray	Nuttall's milkwort
<i>Polygonella americana</i> (Fisch. and Mey)	Small Southern jointweed
<i>Ponthieva racemosa</i> (Walt.) Mohr	Shadow-witch
<i>Porella</i> sp. nov. (sp. 1)	Hot porella
<del><i>Prenanthes aspera</i> Michx.</del>	<del>Rough rattlesnake-root</del>
<i>Prunus pumila</i> L.	sand cherry
<i>Pycnanthemum beadlei</i> (Small) Fern.	Beadle's mountain mint
<i>Prenanthes crepidinea</i> Michx.	Nodding rattlesnake-root
<i>Pycnanthemum verticillatum</i> (Michx.) Pers.	Whorled mountain-mint
<i>Pyrola americana</i> Sweet	American wintergreen
<i>Ranunculus aquatilis</i> var. <i>diffusus</i> Withering	Eastern white water crowfoot
<i>Rhamnus alnifolia</i> L'Hér.	Alderleaf buckthorn
<i>Rhynchosia latifolia</i> Nutt.	Prairie rhynchosia
<i>Rhynchospora alba</i> (L.) Vahl	White beakrush
<i>Rhynchospora capillacea</i> Torr.	Horned beakrush
<i>Rhynchospora debilis</i> Gale	Savannah Beak-Rush
<i>Rhynchospora latifolia</i> (Baldw.) Thomas	Giant white-top sedge
<i>Rhynchospora rariflora</i> (Michx.) Ell.	Few-flowered beak-rush
<i>Rhynchospora wrightiana</i> Boeckler	Wright's beak-rush
<i>Ribes americanum</i> P.Mill.	Wild Black Currant
<i>Rudbeckia triloba</i> L. var. <i>pinnatifida</i> Torrey & A. Gray	browneyed Susan
<i>Rugelia nudicaulis</i> Shuttlw. ex Chapman	Rugel's ragwort
<i>Sabatia capitata</i> (Raf.) Blake	Rose gentian
<i>Sagittaria rigida</i> Pursh	Sessile-Fruited Arrowhead
<i>Sanguisorba canadensis</i> L.	Canada burnet
<del><i>Sarracenia oreophila</i> (Kearney) Wherry</del>	<del>Green pitcher plant</del>
<i>Saxifraga caroliniana</i> A. Gray	Carolina saxifrage
<i>Saxifraga pensylvanica</i> L.	Swamp saxifrage
<i>Schwalbea americana</i> L.	Chaffseed
<i>Scutellaria arguta</i> Buckl.	Hairy scullcap
<i>Sedum nevii</i> A. Gray	Nevius' stonecrop
<i>Seymeria cassioides</i> (J.F. Gmelin) Blake	Seymeria
<i>Sida hermaphrodita</i> (L.) Rusby	Virginia mallow
<i>Silene ovata</i> Pursh	Ovate catchfly
<i>Silene regia</i> Sims	Royal catchfly
<i>Silphium brachiatum</i> Gattinger	Cumberland rosinweed
<i>Silphium wasiotense</i> Medley	Kentucky rosinweed
<i>Solidago gattingeri</i> Chapm.	Gattinger's goldenrod
<i>Solidago lancifolia</i> Torr. and A. Gray	Broadleaf goldenrod
<i>Solidago ptarmicoides</i> (Nees) Bovin	Prairie goldenrod
<i>Solidago rupestris</i> Raf.	Rock goldenrod
<i>Solidago spithamea</i> M.A. Curtis	Blue ridge goldenrod
<i>Sparganium androcladum</i> (Engelm.) Morong	Branching bur-reed
<i>Sphenolobopsis pearsoni</i> (Spruce) Shust. & Kitag.	Sphenolobopsis
<i>Spiraea alba</i> DuRoi	Narrow-leaved meadow-sweet
<i>Spiraea virginiana</i> Britt.	Virginia spiraea
<i>Spiranthes magnicamporum</i> Sheviak	Great Plains Ladies'-Tresses
<i>Spiranthes ochroleuca</i> (Rydb.) Rydb.	Yellow nodding ladies'-tresses
<i>Spiranthes odorata</i> (Nutt.) Lindl.	Sweetscent ladies'-tresses
<i>Sporobolus junceus</i> (P.Beauv.) Kunth	Piney-Woods Dropseed
<i>Stellaria alsine</i> Grimm	Trailing stitchwort

Stellaria longifolia Muhl.	Longleaf stitchwort
Stenanthium diffusum Wofford	Cumberland featherbells
Sullivantia sullivantii (Torr. & Gray) Britt.	Sullivantia
Symphyotrichum praealtum (Poiret) G. L. Nesom	Willow aster
Symphyotrichum pratense (Rafinesque) Nesom	Barrens silky aster
Symplocarpus foetidus (L.) Nutt.	Skunk-cabbage
Taxus canadensis Marsh.	American yew
Tetragonotheca helianthoides L.	Pineland squarehead
Thaspium pinnatifidum (Buckley) A. Gray	Cutleaf meadow parsnip
Thelypteris simulata (Davenport) Nieuwl.	Bog fern
Tortula ammonsiana Crum & Anders.	Ammon's tortula
Tortula fragilis Tayl.	Fragile tortula
Triantha glutinosa (Walter) Small	Coastal False Asphodel
Triantha racemosa (Walter) Small	Coastal false-asphodel
Trichophorum cespitosum (L.) Hartman	Tufted club-rush
Trifolium calcaricum J.L. Collins & Wieboldt	Running glade clover
Trifolium reflexum L.	Buffalo clover
Trillium decumbens Harbison	Trailing trillium
Trillium lancifolium Raf.	Narrow-leaved trillium
Trillium pusillum Michx.	Least trillium
Trillium rugelii Rendle	Southern nodding trillium
Utricularia cornuta Michx.	Horned bladderwort
Vaccinium elliotii Chapm.	Mayberry
Veronica catenata Pennell	Sessile water-speedwell
Veronica scutellata L.	Marsh-speedwell
Viburnum bracteatum Rehd.	Limerock arrowwood
Viburnum molle Michx.	Softleaf arrow-wood
Vitis rupestris Scheele	Rock grape
Xyris ambigua Beyr. ex. Kunth.	Coastal-plain yellow-eyed-grass
Xyris fimbriata Ell.	Fringed yellow-eyed-grass
Xyris tennesseensis R. Krai	Tennessee yellow-eyed-grass
Zigadenus glaucus Nutt.	White camas

Authority: T.C.A. §§ 70-8-301 et seq., and 4-5-201 et seq.

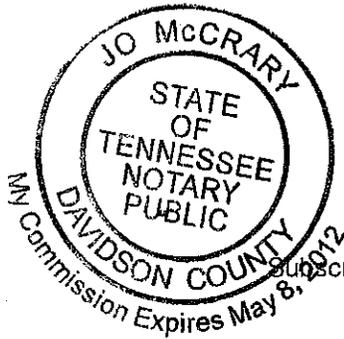
\* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Commissioner on 05/05/2011 (mm/dd/yyyy), and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 12/09/10

Rulemaking Hearing(s) Conducted on: (add more dates). 02/18/11



Date: 5-5-11

Signature: [Handwritten Signature]

Name of Officer: Robert J. Martineau, Jr.

Title of Officer: Commissioner of TDEC

Subscribed and sworn to before me on: 5-5-11

Notary Public Signature: Jo McCrory

My commission expires on: May 8, 2012

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

[Handwritten Signature]  
Robert E. Cooper, Jr.  
Attorney General and Reporter  
9-20-11  
Date

**Department of State Use Only**

Filed with the Department of State on: 9/26/11

Effective on: 12/25/11

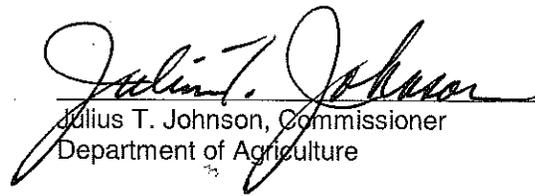
[Handwritten Signature]  
Tre Hargett  
Secretary of State

SECRETARY OF STATE  
PUBLICATIONS

2011 SEP 26 AM 11:55

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Pursuant to T.C.A. §§ 70-8-305 and 70-8-313, I have reviewed and concur in these amendments to Chapter 0400-06-02, including the additions and deletions to the list of endangered species.

  
Julius T. Johnson, Commissioner  
Department of Agriculture

**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: Mental Health  
DIVISION: Administrative Services  
SUBJECT: Personnel Conduct toward Patients and Residents  
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 33-1-202  
EFFECTIVE DATES: December 22, 2011 through June 30, 2012  
FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

Rules Chapter 0940-02-03 *Personnel Conduct toward Patients and Residents* deals with the prevention and correction of staff conduct which interferes with the right of residents and patients to humane care and treatment at all facilities of the Tennessee Department of Mental Health (TDMH). Rules Chapter 0940-02-03 *Personnel Conduct toward Patients and Residents* is being repealed, and the subject matter of this rule will be dealt with through departmental policy.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

A public hearing on Rules Chapter 0940-02-03 Personnel Conduct toward Patients and Residents was held on August 30, 2011 at 9:30 a.m. in the third floor large conference room of the Cordell Hull Building in Nashville, Tennessee. The following departmental staff attended the hearing: Kurt Hippel, Rules Coordinator; Karen Edwards, Senior Policy Analyst and Research Coordinator; Vickie Graham, Director of Human Resources; and Rachel Jones, Administrative Services Assistant. No one else attended the hearing. No written or oral comments were received.

**Regulatory Flexibility Addendum**

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

Rules Chapter 0940-02-03 Personnel Conduct toward Patients and Residents deals with the prevention and correction of staff conduct which interferes with the right of residents and patients to humane care and treatment at all facilities of the Tennessee Department of Mental Health (TDMH). The Repeal of Rules Chapter 0940-02-03 Personnel Conduct toward Patients and Residents will not affect small businesses.

### **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Repeal of Rules Chapter 0940-02-03 Personnel Conduct toward Patients and Residents will not have a projected impact on local governments.

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**For Department of State Use Only**

Sequence Number: 09-20-11  
Rule ID(s): 5025  
File Date: 09/23/2011  
Effective Date: 12/22/2011

## Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

<b>Agency/Board/Commission:</b>	Tennessee Department of Mental Health
<b>Division:</b>	Administrative Services Division
<b>Contact Person:</b>	Kurt Hippel
<b>Address:</b>	425 Fifth Avenue North 3 <sup>rd</sup> Floor, Cordell Hull Building Nashville, TN
<b>Zip:</b>	37243
<b>Phone:</b>	615-532-9439
<b>Email:</b>	Kurt.Hippel@tn.gov

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
0940-02-03	Personnel Conduct toward Patients and Residents
Rule Number	Rule Title
0940-02-03-.01	Purpose
0940-02-03-.02	Justified Employee Conduct
0940-02-03-.03	Resident or Patient Abuse by Employees
0940-02-03-.04	Other Kinds of Mistreatment of Residents or Patients by Employees
0940-02-03-.05	Presumption of Failure to Perform Duties

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

#### Repeals

Chapter 0940-02-03 Personnel Conduct toward Patients and Residents is repealed in its entirety.

Authority: T.C.A. §§ 4-4-103, 33-1-202, 33-1-203, 33-1-302, 33-1-303, 33-1-305, and 33-1-309.

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

~~0940-02-03-.01 Purpose.~~

- ~~(1) The prevention and correction of staff conduct which interferes with the right of residents and patients to humane care and treatment under T.C.A. 33-306(b) is of the highest priority at all facilities of the Department. All residents and patients in its facilities shall be treated with dignity, respect, and considerations. Improper conduct of any kind and in particular any conduct which is abusive toward residents and patients is not tolerated. Any employee who engages in conduct covered by these rules shall be immediately disciplined in conformity with them. Other kinds of conduct which may affect residents or patients are governed by other laws, rules, and policies~~
- ~~(2) The specific purpose of these rules is to provide clear guidance to administrators and employees as to conduct which the Department views as against the good of the service under T.C.A. 8-30-326 and violative of the rules of the Department of Personnel found in Chapter 1120-07-02 of the Rules and Regulations of the State of Tennessee and to prescribe mandatory action to be taken in cases of resident or patient abuse.~~

Authority: T.C.A. §§33-104, 33-105, 33-306(b).

~~0940-02-03-.02 Justified Employee Conduct.~~

~~IF:~~

- ~~(1) an employee engages in conduct which would otherwise be a violation of Rule 0940-02-03-.03 or .04, AND~~
- ~~(2) (a) the conduct is reasonably necessary to protect either the resident or patient or the employee or another person from harm, OR~~
- ~~(b) the conduct is authorized by the resident's or patient's individual habilitative or treatment plan which reasonably appears to be a proper plan, THEN~~
- ~~(3) the employee is not guilty of a violation of this Chapter by that conduct.~~

Authority: T.C.A. §§ 33-104, 33-105, and 33-306(b).

~~0940-02-03-.03 Resident or Patient Abuse by Employees.~~

~~Employees shall not:~~

- ~~(a) Knowingly threaten to touch, attempt to touch, or actually touch a resident or patient in any manner which a reasonable person would recognize as likely to be harmful or painful or to cause mental anguish, or~~
- ~~(b) Knowingly suggest, invite, permit, or engage in any sexual contact or sexual intercourse between an employee and a resident or patient who is not the employee's spouse, or~~
- ~~(c) Knowingly engage in any conduct toward a resident or patient which a reasonable person would recognize as brutal or cruel under the circumstances, or~~
- ~~(d) Knowingly fail to take reasonable steps to intervene to prevent or stop resident or patient abuse by another employee or conduct by a resident or patient which is likely to be harmful to another resident or patient, or~~
- ~~(e) Knowingly fail to perform duties with respect to a resident or patient which such failure is likely to disrupt the habilitative or treatment plan of the resident or patient, or~~

- ~~(f) Fail to perform duties with respect to a resident or patient when such failure is likely to expose the resident or patient to an unreasonable risk of physical, developmental or mental harm.~~

~~If an employee engages in conduct prohibited by this rule, the employee is guilty of conduct against the good of the service, and the employee shall be dismissed. Such a violation is most likely to be determined to be gross misconduct.~~

~~Authority: T.C.A. §§ 33-104, 33-105 and 33-306(b).~~

~~0940-02-03-.04 Other Kinds of Mistreatment of Residents or Patients by Employees.~~

~~Employees shall not:~~

- ~~(a) Knowingly threaten to touch, attempt to touch, or actually touch a resident or patient in any manner which a reasonable person would recognize as likely to be offensive, or~~
- ~~(b) Knowingly engage in any conduct which is violative of a resident's or patient's human dignity, or~~
- ~~(c) Knowingly cause or encourage a resident or patient to violate the law, or~~
- ~~(d) Knowingly make or cause use of a resident's or patient's property to the disadvantage of the resident or patient or in any way which violates the law or the rules or policies of the Department or the institution with or without the consent of the resident or patient, or~~
- ~~(e) Permit any kind of mistreatment of a resident or patient to any degree by failure to perform supervisory duties properly, or~~
- ~~(f) Make unjustified derogatory comments about a resident or patient to or in the presence of the resident or patient or another person, or~~
- ~~(g) Knowingly fail to take reasonable steps to intervene to prevent or stop any kind of mistreatment of a resident or patient by another employee, or~~
- ~~(h) Knowingly fail to report promptly a violation of Rule 0940-02-03-.03 or to cooperate with an investigation of such conduct, or~~
- ~~(i) Otherwise fail to perform duties with respect to a resident or patient.~~

~~If an employee engages in conduct prohibited by this rule, the employee is guilty of conduct against the good of the service and the employee is subject to discipline, including suspension or dismissal. Mistreatment of a resident or patient may also be determined to be gross misconduct.~~

~~Authority: T.C.A. §§ 33-104, 33-105 and 33-306(b).~~

~~0940-02-03-.05 Presumption of Failure to Perform Duties.~~

~~It is presumed under this Chapter that an employee has failed to perform duties with respect to a resident or patient in violation of Rule 0940-02-03-.04 (5), (7), or (9) when the following facts are established after a thorough investigation:~~

- ~~(1) the resident or patient is suffering from a wound, injury, disability, or physical or mental condition which is of such a nature as to reasonably indicate that it has been caused by brutality, abuse, or neglect or which on the basis of available information reasonably appears to have been caused by brutality, abuse, or neglect, and~~
- ~~(2) the identity of the person who caused the harm cannot be determined, and~~
- ~~(3) the period of time and the unit or place in which the harm occurred can be determined with reasonable particularity; and~~

~~(4) the employee had, in the unit or place and during that time, either direct responsibility for the care of the resident or patient or direct access to the person.~~

Authority: ~~T.C.A. §§ 33-104, 33-105 and 33-306(b).~~

Repeals

Chapter 0940-02-03 Personnel Conduct toward Patients and Residents is repealed in its entirety.

Authority: T.C.A. §§ 4-4-103, 33-1-202, 33-1-203, 33-1-302, 33-1-303, 33-1-305, and 33-1-309.

REPEAL

\* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the TN Dept of Mental Health (board/commission/ other authority) on 9/1/11 (mm/dd/yyyy), and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 07/11/2011

Rulemaking Hearing(s) Conducted on: (add more dates). 08/30/2011

Date: 9/1/11

Signature: [Handwritten Signature]

Name of Officer: E. Douglas Varney

Title of Officer: Commissioner



Subscribed and sworn to before me on: 9-1-11

Notary Public Signature: Rebecca E. Calvert

My commission expires on: 6/3/2012

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

[Handwritten Signature]  
Robert E. Cooper, Jr.  
Attorney General and Reporter  
9-20-11

Date

Department of State Use Only

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Filed with the Department of State on: 9/23/11

Effective on: 12/22/11

[Handwritten Signature]  
T're Hargett  
Secretary of State

**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: State Board of Education

DIVISION:

SUBJECT: Transportation Services by Non-School Community-Based Organizations

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 49-1-302

EFFECTIVE DATES: February 28, 2012 through June 30, 2012

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT: Chapter 0520-12-01 references laws specific to public and private school-administered programs. For non-school community-based organizations' transportation of program participants, the enforcement of the Transportation Section, Rule 0520-12-01-.13, was in conflict with the vehicle inspection and bus driver licensing and training conducted by the Department of Safety.

The changes to this rule were approved by the State Board of Education on October 29, 2009, but this particular change was mistakenly omitted from the rule filing with the Secretary of State.

**Regulatory Flexibility Addendum**

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rulemaking process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

Not applicable.

### Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

(Insert statement here)

This will have no impact on local governments.

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**For Department of State Use Only**

Sequence Number: 09-24-11  
Rule ID(s): 5027  
File Date: 09/29/2011  
Effective Date: 02/28/2012

## Proposed Rule(s) Filing Form

*Proposed rules are submitted pursuant to T.C.A. §4-5-202, 4-5-207 in lieu of a rulemaking hearing. It is the intent of the Agency to promulgate these rules without a rulemaking hearing unless a petition requesting such hearing is filed within sixty (60) days of the first day of the month subsequent to the filing of the proposed rule with the Secretary of State. To be effective, the petition must be filed with the Agency and be signed by twenty-five (25) persons who will be affected by the amendments, or submitted by a municipality which will be affected by the amendments, or an association of twenty-five (25) or more members, or any standing committee of the General Assembly. The agency shall forward such petition to the Secretary of State.*

<b>Agency/Board/Commission:</b>	State Board of Education
<b>Division:</b>	
<b>Contact Person:</b>	Dannelle Walker
<b>Address:</b>	9th Floor, 710 James Robertson Pkwy, Nashville, TN
<b>Zip:</b>	37243
<b>Phone:</b>	615-253-5707
<b>Email:</b>	Dannelle.walker@tn.gov

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
CHAPTER 0520-12-01	Standards for Child Care Centers And School-Age Child Care Programs
Rule Number	Rule Title
0520-12-1-.13	Transportation

Chapter Number	Chapter Title
Rule Number	Rule Title

**RULES  
OF  
THE STATE BOARD OF EDUCATION  
OFFICE OF THE COMMISSIONER**

**CHAPTER 0520-12-01  
STANDARDS FOR INFANT/TODDLER, PRESCHOOL AND SCHOOL-AGE EXTENDED CARE  
PROGRAMS**

**0520-12-1-.13 TRANSPORTATION.**

(1) Management Responsibility

- (a) If a program provides transportation or contracts for transportation, the program's management shall be fully responsible for all transportation of children, including between home and program (if different facility from school), to and from school, and on field trips.
  
- (b) Program management is responsible for operating transportation services in compliance with:
  - 1. All State laws, regarding school transportation, T.C.A. §§ 49-6-2102 through 49-6-2115 & 49-6-2117 through 49-6-2118;
  - 2. All rules and regulations, promulgated by State Board of Education, Chapter 0520-1-5 regarding school transportation and school buses.
  - 3. If a program is administered by a community-based organization, which is not approved as a school (non-school, community-based organization) and provides transportation or contracts for transportation, the transportation plan and vehicle requirements are excluded from 0520-12-01-.13 (1)(b) 1. & 2. The non-school community-based organization administered program shall establish a transportation plan and maintain vehicle requirements in accordance with 0520-12-01-.13(4).
  
- (c) Vehicles used to transport children and which are owned or operated by, contracted for or which are otherwise under the direction or control of the school-administered program, shall carry automobile liability insurance coverage for each vehicle used for that purpose in the minimum amounts required by T.C.A. § 49-6-2111 and defined in State Board of Education Pupil Transportation rules 0520-1-5-.01(2).
  - 1. Automobile insurance coverage for non-school community-based organizations which transport children:
    - (i) Automobile liability coverage shall be maintained in a minimum amount of five hundred thousand dollars (\$500,000) combined single limit of liability.
    - (ii) Medical payment coverage shall be maintained in the minimum amount of five thousand dollars (\$5,000) for injuries to children being transported in vehicles owned, operated or leased by the non-school community-based organization's program.

- (d) Vehicles used to transport children must be in compliance with the Federal Motor Vehicle Safety Standards as defined by Title 49 part 571 of the Code of Federal Regulations and the *Tennessee Minimum School Bus Standards*, adopted by the State Board of Education as required by Rule 0520-1-5-.02.
1. Unless the certification label states the 15 passenger van is a "school bus", the National Traffic and Motor Vehicle Safety Act, 49 USC Section 30112, prohibits the use of a 15 passenger van to transport students to and from school or a school-related activity. The 15 passenger van is defined as any vehicle that seats 10 to 15 passengers, not including the driver.
  2. Children may be transported in passenger vehicles, however, children of all ages but must be in compliance with passenger restraint laws, T. C. A. § 55-9-602 at all times in passenger vehicles (vehicles weighing less than 10,000 pounds).
    - (i) Any child under one (1) year of age or any child weighing less than twenty pounds (20 lbs) or less shall be properly secured in a child passenger restraint system in a rear facing position.
    - (ii) Any child, one (1) through three (3) years of age weighing greater than twenty pounds (20 lbs) shall be properly secured in a child passenger restraint system in a forward facing position.
    - (ii) Any child, four (4) through eight (8) years of age and measuring less than four feet, nine inches in height shall be properly secured in a passenger motor vehicle using a separate carrier, an integrated child seat or a belt-positioning booster seat.
    - (iv) Any child, nine (9) through twelve (12) years of age, measuring four feet, nine inches or more in height, shall be properly secured in a passenger motor vehicle using a seat belt system in the rear seat of the vehicle.
    - (v) Any child, thirteen (13) through fifteen (15) years of age, shall be properly secured in a passenger motor vehicle using a seat belt system.
- (e) Federally approved child care restraint systems must be provided and utilized during the transport of any child three (3) years of age and under on a school bus.
- (f) No child shall be allowed to ride on the floor of a vehicle, and no child shall be placed with another child in the same restraint device.
- (g) All school buses shall be inspected in compliance with the *Rules and Regulations for School Bus Inspection*, Chapter 1340-3-3, promulgated by and regulated by the Tennessee Department of Safety.
- (h) All persons hired for the position of "school bus driver" shall:
1. Be issued a commercial driver's license (CDL) by the TN Department of Safety;
    - (i) Bus drivers employed by **public** school/school system shall have an S endorsement.
    - (ii) Bus drivers employed by **non-public school** or non-school, community-

- based organization shall have a P endorsement **and** completion of school bus driver training.
2. Knows and understands the school system's or private school's policies and procedures concerning transportation and to bus driver's responsibilities and duties;
  3. Has no criminal offense or criminal record of a violation of any of the following:
    - (i) Driving under the influence of an intoxicant as prohibited by T.C.A. § 55-10-401;
    - (ii) Vehicular assault as prohibited by T.C.A. § 39-13-106;
    - (iii) Vehicular homicide as prohibited by T.C.A. § 39-13-213(a)(2);
    - (iv) Aggravated vehicular homicide as prohibited by T.C.A. § 39-13-218; or
    - (v) Manufacture, delivery, sale or possession of a controlled substance as prohibited by T.C. A. § 39-17-417;
  4. Completed the annual physical and mental examinations of school bus drivers as required by T.C.A. § 49-6-2108;
  5. Complete the annual training for school bus drivers presented by the TN Department of Safety. School bus driver training is not required for drivers of passenger vehicles only.
    - (i) Drivers of any passenger vehicle, used to transport children, shall possess a current, valid driver's license and endorsement required by the TN Department of Safety for transporting children in the applicable type of vehicle.
    - (j) Seating capacity on a school bus shall be in compliance with T.C.A. 49-6-2110 (a), requiring a minimum of thirteen linear inches of seat space for each student.
    - (k) Vehicles used for transporting children shall have a clearly visible identifying sign.
      1. Exceptions to vehicle identification, i.e. signage:
        - (i) Vehicles used exclusively for the occasional field trip;
        - (ii) Vehicles used exclusively for the limited provision of emergency transportation, e.g., vehicle used when regular vehicle has a mechanical breakdown.;
        - (iii) The Department may waive the vehicle identification requirements for programs under the direction or control of a public agency.
    - (l) Develop transportation routes (school bus routes) in compliance with T.C.A. § 49-6-2105 to ensure no child is on a school bus more than one and one-half (1 ½) hours in the morning and one and one-half (1 ½) hours in the afternoon.
    - (m) A vehicle used to transport children shall have fire extinguishers, emergency reflective triangles, a first aid kit, and a blood-borne pathogenic clean-up kit, and an adult familiar with the use of this equipment on board. Emergency exiting procedures shall be

- practiced by all staff responsible for transporting children on a regular basis. (Not applicable to occasional transportation by volunteers)
- (n) Firearms are prohibited in vehicles used to transport children.
- (2) Supervision of Children During Transportation.
- (a) An adult must be in the vehicle whenever a child is in the vehicle.
  - (b) An adult must be seated behind the steering wheel if the motor is running and children are being loaded and/or are on board.
  - (c) Transportation of children with special needs shall be in compliance with the Individual Education Plan (IEP) for each child. Bus drivers who do not return to a central depot shall stipulate that all buses will be checked at the end of every run to make sure that no person remains on the bus as defined in T.C.A. § 49-6-2114.
  - (d) Adult Monitor Requirements.
    - 1. An adult monitor, in addition to the driver, is required on the vehicle for the transportation of four (4) or more children ages six (6) weeks to four (4) years of age.
    - 2. An adult monitor, in addition to the driver, is required on the vehicle for all routes exceeding thirty (30) minutes for children ages six (6) weeks to four (4) years of age, regardless of the total number of children being transported.
    - 3. An adult monitor, in addition to the driver, is required on the vehicle for the transportation of four (4) or more non-ambulatory children (permanently or temporarily non-ambulatory) of any age.
    - 4. An adult monitor, in addition to the driver, is required if more than ten (10) pre-kindergarten students four (4) years of age are transported on the same bus.
    - 5. An adult monitor shall not be seated in the front passenger seat, but shall be seated in the vehicle in a position which will allow:
      - (i) Each child to be seen with a quick glance;
      - (ii) Each child to be heard at all times;
      - (iii) Each child's activities to be observed; and
      - (iv) The monitor to respond immediately should there be an emergency.
- (3) Responsibility for Loading, Unloading and Tracking Each Child.
- (a) Passenger Log:
    - 1. A passenger log shall be used to track each child during transportation.
    - 2. The first and last name of each child received for transport shall be recorded on the passenger log. A sibling group shall not be listed as a single group entry, for example, "Smith children".

3. The driver of the vehicle or the monitor shall be designated by management as the person responsible for completing the log.
- (b) Loading Procedures:
1. As each child is loaded onto the vehicle the time the child was placed on the vehicle shall be recorded on the passenger log.
  - ~~2. If the child was loaded from home, the parent or other authorized person will additionally sign the log indicating the child was placed on the vehicle.~~
- (c) Unloading Procedures:
1. The individual designated by the program as responsible for the log shall update it immediately upon the child being released from the vehicle. The designated staff member shall update the log by:
    - (i) Recording the time the child was released; and
    - (ii) Initialing next to the time of release.
  - ~~1. When the child is released to a parent or other authorized person, that person must sign the log indicating that the child was released to them.~~
  3. When Pre-Kindergarten children are transported on the return route, the school bus driver must not leave a Pre-K child at the child's home or bus stop unless the parent or other authorized person is present. If the parent or other authorized person is not present, the Pre-K student is not to exit the bus and the school bus driver is to follow the process/policy developed by the school system in collaboration with the Department of Children's Services and/or the police or sheriff's office.
- (d) Confirming that Every Child is Off the Vehicle.
1. Driver Responsibilities. Immediately upon unloading the last child and to ensure that all children have been unloaded the driver shall:
    - (i) Physically walk through the vehicle;
    - (ii) Inspect all seat surfaces, under all seats and in all compartments or recesses in the vehicle's interior.
    - (iii) Sign the log, with the driver's full name, indicating the children are all unloaded.
- (e) If a child is expected for transport (based on the roster) but is not present at the location, the driver may not leave the location without checking with a designated member of staff and the center. If the designated member of staff is not present in the loading area and there is not an additional adult on the vehicle, all children will accompany the driver into the facility to verify the whereabouts of the child.
- (4) Transportation provided by non-school, community-based organization.
- (a) Non-school, community-based organizations providing transportation for child care shall

" provide a written statement to the Department:

1. Stating the type(s) of transportation offered, e.g. transportation to and/or from school to
2. Listing and describing the vehicles that will be used for the transportation of children;
3. Describing any contracts, agreements or arrangements with any third (3<sup>rd</sup>) parties for the provision of transportation services, with copies of such contracts or agreements or arrangements available upon the Department's request.
4. Describing the agency's policy, procedures and staff training plans for maintaining compliance with responsibilities for loading and unloading and tracking each child.
5. Describing the agency's management plan for ensuring all transportation staff properly perform their duties in accordance with the licensing rules and agency policies and procedures;
6. Describing the agency's policy, procedures and staff transportation training plans for maintaining compliance with transportation rules and state law;
7. Describing the agency's policy, procedures and staff training plans for the emergency evacuation of the vehicle.

(b) Non-school, community-based organization's vehicle requirements and inspections.

1. Department of Safety Inspections. Annually, all non-school, community-based organizations vehicles that are designed by the vehicle manufacturer to carry ten (10) or more passengers must be inspected in accordance with the schedule established by the Department of Safety. Any maintenance or repair to the vehicles disclosed by the inspections shall be the sole responsibility of the non-school, community-based organization.
  - (i) The non-school, community-based organization's vehicle may have a stop arm in accordance with T.C.A. § 55-8-151(d) if the bus driver has completed annual school bus driver training provided by the Department of Safety.
  - (ii) The non-school, community-based organization's vehicle with a stop arm is required to be distinctly marked "Youth Bus" on the front and rear thereof in letters not less than six inches (6") in height and legibly written.
2. No vehicle which does not pass the inspections required in this paragraph (4) shall be used by the non-school, community-based organization to provide transportation services until necessary repairs, as determined by Department of Safety, have been made.
3. Receive regular inspections and maintenance by a certified mechanic in accordance with the maintenance schedule recommended by the vehicle manufacturer.
4. Have the following vehicle equipment certified as inspected at least every four thousand (4,000) miles if not covered by and/or otherwise serviced in accordance with the manufacturer's maintenance schedule: brakes; steering; oil levels; coolant; brake, windshield-washer and transmission fluids; hoses and belts; and tires.
5. The following equipment shall be maintained in the vehicle and stored in a manner which is not readily accessible to children: fire extinguisher; emergency reflective

- triangles; first aid kit; blood-borne pathogenic clean-up kit; and seat-belt cutter or similar device designed to immediately release the vehicle's child restraint system(s) in an emergency.
- (i) The bus driver or transportation monitor assigned to the vehicle shall be familiar with the location and use of all equipment required under subparagraph 4.
6. The non-school, community-based organization shall maintain documentation that the following daily inspections have been performed and any necessary repairs completed or other appropriate action taken before transporting children.
- (i) A visual inspection of the vehicle's tires for wear and adequate pressure;
  - (ii) A visual inspection for working headlights and taillights (brake lights and back-up lights), signals, mirrors, wiper blades and dash gauges.
  - (iii) An inspection of properly functioning child and driver safety restraints;
  - (iv) An inspection for properly functioning doors and windows;
  - (v) An inspection for the presence of safety equipment required by these rules or any other provisions of law or regulations, and repair or replacement as necessary based upon visual evidence of the need to do so;
  - (vi) A determination that the vehicle has adequate fuel; and
  - (vii) An inspection for, and cleaning of, debris from the vehicle's interior.
7. Emergency exiting procedures shall be practiced on a regular basis by all staff responsible for transporting children.
- (5) Non-school community-based organizations contracting for transportation services.
1. Any vehicle, contracted for the purposes of transporting children in a program administered by a non-school, community-based organization shall be a for hire commercial passenger vehicle properly registered with the Federal Motor Carrier Safety Administration., <http://www.fmcsa.dot.gov> .  
For hire commercial passenger vehicle registration:  
<http://www.fmcsa.dot.gov/registration-licensing/online-registration/onlineregdescription.htm>
  2. The contracted vehicle shall have a commercial license plate (tag).
  3. The contracted vehicle shall have minimum levels of liability insurance as defined by the Federal Motor Carrier Safety Administration rule §387.33. Any vehicle with seating capacity of sixteen (16) passengers or more shall have five million dollars (\$5,000,000) liability coverage. Any vehicle with seating capacity of fifteen (15) passengers or less shall have one and one half million dollars (\$1,500,000) liability coverage.

\* If a roll-call vote was necessary, the vote by the Agency on these rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Jim Ayers	X				
Vernita Justice	X				
Carolyn Pearre	X				
Richard Ray	X				
Jean Anne Rogers	X				
Fielding Rolston	X				
Theresa Sloyan	X				
Chip Woods	X				
Melvin Wright	X				

I certify that this is an accurate and complete copy of proposed rules, lawfully promulgated and adopted by the State Board of Education on 10/29/2010, and is in compliance with the provisions of T.C.A. § 4-5-222. The Secretary of State is hereby instructed that, in the absence of a petition for proposed rules being filed under the conditions set out herein and in the locations described, he is to treat the proposed rules as being placed on file in his office as rules at the expiration of sixty (60) days of the first day of the month subsequent to the filing of the proposed rule with the Secretary of State.

Notice of Rulemaking Hearing filed with the Department of State on: 08/26/2010

Rulemaking Hearing(s) Conducted on: (add more dates). 10/19/2010

Date: 9-9-11

Signature: Gary Nixon

Name of Officer: Gary Nixon

Title of Officer: Executive Director



Subscribed and sworn to before me on: 9/9/11

Notary Public Signature: Phyllis E Childress

My commission expires on: \_\_\_\_\_

All proposed rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.  
 Robert E. Cooper, Jr.  
 Attorney General and Reporter  
9-23-11  
 Date

Department of State Use Only

Filed with the Department of State on: \_\_\_\_\_

9/29/11

Effective on: \_\_\_\_\_

2/28/12

*Tre Hargett*

Tre Hargett  
Secretary of State

**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: Finance and Administration

DIVISION: Bureau of TennCare

SUBJECT: Smoking Cessation Products

STATUTORY AUTHORITY: Tennessee Code Annotated, Sections 71-5-105 and 71-5-109

EFFECTIVE DATES: December 22, 2011 through June 30, 2012

FISCAL IMPACT: The agency projects that the promulgation of these rules will increase annual state expenditures by \$3,500,00.

STAFF RULE ABSTRACT: This rule replaces an emergency rule on the same subject.

This rule reflects that effective July 1, 2011, TennCare Medicaid is covering smoking cessation products for adult enrollees.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

There were no public comments on these rules.

**Regulatory Flexibility Addendum**

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

The rules are not anticipated to have an effect on small businesses.

## Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The rules are not anticipated to have an impact on local governments.

**Department of State**  
**Division of Publications**  
 312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower  
 Nashville, TN 37243  
 Phone: 615-741-2650  
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**For Department of State Use Only**

Sequence Number: 09-16-11  
 Rule ID(s): 3019  
 File Date: 09/23/2011  
 Effective Date: 12/22/2011

# Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

<b>Agency/Board/Commission:</b>	Tennessee Department of Finance and Administration
<b>Division:</b>	Bureau of TennCare
<b>Contact Person:</b>	George Woods
<b>Address:</b>	Bureau of TennCare 310 Great Circle Road Nashville, Tennessee
<b>Zip:</b>	37243
<b>Phone:</b>	(615) 507-6446
<b>Email:</b>	George.woods@tn.gov

**Revision Type (check all that apply):**

- Amendments  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1200-13-13	TennCare Medicaid
Rule Number	Rule Title
1200-13-13-.04	Covered Services
1200-13-13-.10	Exclusions
1200-13-13-.11	Appeal of Adverse Actions Affecting TennCare Services or Benefits

Chapter Number	Chapter Title
1200-13-13	TennCare Medicaid
Rule Number	Rule Title
1200-13-13-.04	Covered Services
1200-13-13-.10	Exclusions
1200-13-13-.11	Appeal of Adverse Actions Affecting TennCare Services or Benefits

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

Paragraph (C) the last paragraph of the "BENEFIT FOR PERSONS AGED 21 AND OLDER" column of Part 25. of Subparagraph (b) of Paragraph (1) of Rule 1200-13-13-.04 Covered Services is deleted in its entirety and replaced with a new (C) which shall read as follows:

SERVICE	BENEFIT FOR PERSONS UNDER AGE 21	BENEFIT FOR PERSONS AGED 21 AND OLDER
		<p><del>(C) Over the counter drugs for Medicaid adults are not covered even if the enrollee has a prescription for such service, except for prenatal vitamins for pregnant women</del></p> <p><u>(C) Over-the-counter (OTC) drugs for TennCare adults are not covered even if the enrollee has a prescription for such service, unless the drug is listed on the "Covered OTC Drug List" that is available on the TennCare website located at <a href="http://www.tn.gov/tenncare">www.tn.gov/tenncare</a> on the date of service.</u></p>

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Part 5. "Agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d." of Subparagraph (c) of Paragraph (1) of Rule 1200-13-13-.04 Covered Services is deleted in its entirety and subsequent Parts renumbered accordingly.

(c) Pharmacy

TennCare is permitted under the terms and conditions of the demonstration project approved by the federal government to restrict coverage of prescription and non-prescription drugs to a TennCare-approved list of drugs known as a drug formulary. TennCare must make this list of covered drugs available to the public. Through the use of a formulary, the following drugs or classes of drugs, or their medical uses, shall be excluded from coverage or otherwise restricted by TennCare as described in Section 1927 of the Social Security Act [42 U.S.C. §1396f-8]:

1. Agents for weight loss or weight gain.
2. Agents to promote fertility or for the treatment of impotence or infertility or for the reversal of sterilization.
3. Agents for cosmetic purposes or hair growth.
4. Agents for symptomatic relief of coughs and colds.

~~5. Agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d.~~

6.5. Agents which are benzodiazepines or barbiturates.

7.6. Prescription vitamins and mineral products, except prenatal vitamins and fluoride preparations.

8.7. Nonprescription drugs.

9.8. Covered outpatient drugs, which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or his designee.

TennCare shall not cover drugs considered by the FDA to be Less Than Effective (LTE) and DESI drugs, or drugs considered to be Identical, Related and Similar (IRS) to DESI and LTE drugs or any other pharmacy services for which federal financial participation (FFP) is not available. The exclusion of drugs for which no FFP is available extends to all TennCare enrollees regardless of the enrollee's age. TennCare shall not cover experimental or investigational drugs which have not received final approval from the FDA.

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Subpart (v) "Agents when used to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d" of Part 20. of Subparagraph (a) of Paragraph (3) of Rule 1200-13-13-.10 Exclusions is deleted in its entirety and subsequent Parts are renumbered accordingly.

(3) Specific exclusions. The following services, products, and supplies are specifically excluded from coverage under the TennCare Section 1115 waiver program unless excepted by paragraph (2) herein. Some of these services may be covered under the CHOICES program or outside TennCare under a Section 1915(c) Home and Community Based Services waiver when provided as part of an approved plan of care, in accordance with the appropriate TennCare Home and Community Based Services rule.

(a) Services, products, and supplies that are specifically excluded from coverage except as medically necessary for children under the age of 21

20. Certain pharmacy items as follows:

(i) Agents when used for anorexia or weight loss

(ii) Agents when used to promote fertility

(iii) Agents when used for cosmetic purposes or hair growth

(iv) Agents when used for the symptomatic relief of cough and colds

~~(v) Agents when used to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d~~

~~(vi)~~(v) Covered outpatient drugs which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or its designee

~~(vii)~~(vi) Nonprescription drugs

~~(viii)~~(vii) Barbiturates

~~(ix)~~(viii) Benzodiazepines

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Subpart (v) "agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d;" of Part 2. of Subparagraph (b) of Paragraph (5) of Rule 1200-13-13-.11 Appeal of Adverse Actions Affecting TennCare Services or Benefits is deleted in its entirety and subsequent Subparts are renumbered accordingly.

- (b) A pharmacist shall dispense a seventy-two (72) hour interim supply of the prescribed drug, as mandated by the preceding paragraph, provided that:
2. The medication is not a drug in one of the non-covered TennCare therapeutic categories that include:
    - (i) agents for weight loss or weight gain;
    - (ii) agents to promote fertility or to treat impotence;
    - (iii) agents for cosmetic purposes or hair growth;
    - (iv) agents for the symptomatic relief of coughs and colds;
    - ~~(v) agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d;~~
    - (vi)(v) prescription vitamins and mineral products except prenatal vitamins and fluoride preparations;
    - ~~(vii)~~(vi) nonprescription drugs;
    - ~~(viii)~~(vii) covered outpatient drugs which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or its designee; or
    - ~~(ix)~~(viii) barbiturates or benzodiazepines.

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

GW10111168R

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of Finance and Administration (board/commission/ other authority) on 9/13/11 (mm/dd/yyyy), and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/28/2011

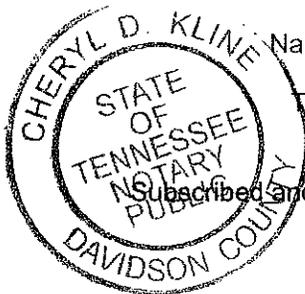
Rulemaking Hearing(s) Conducted on: (add more dates). 08/30/2011

Date: 9/13/11

Signature: Wendy Long MD

Name of Officer: Wendy Long, MD

Title of Officer: Chief Medical Officer



Subscribed and sworn to before me on: 9/13/2011

Notary Public Signature: Cheryl D. Kline

My commission expires on: 9/13/2012

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert E. Cooper, Jr.  
Robert E. Cooper, Jr.  
Attorney General and Reporter  
9-23-11  
Date

Department of State Use Only

Filed with the Department of State on: 9/23/11

Effective on: 12/22/11

Tie Hargett  
Tie Hargett  
Secretary of State

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**G.O.C. STAFF RULE ABSTRACT**

DEPARTMENT: Finance and Administration

DIVISION: Bureau of TennCare

SUBJECT: Smoking Cessation Products

STATUTORY AUTHORITY: Tennessee Code Annotated, Sections 71-5-105 and 71-5-109

EFFECTIVE DATES: December 22, 2011 through June 30, 2012

FISCAL IMPACT: The agency projects that the promulgation of these rules will increase annual state expenditures by \$3,500,00.

STAFF RULE ABSTRACT: This rule replaces an emergency rule on the same subject.

This rule reflects that effective July 1, 2011, TennCare Standard is covering smoking cessation products for adult enrollees.

## Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

There were no public comments on these rules.

**Regulatory Flexibility Addendum**

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

The rules are not anticipated to have an effect on small businesses. 3

### **Impact on Local Governments**

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The rules are not anticipated to have an impact on local governments.

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**Division of Publications**  
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**For Department of State Use Only**

Sequence Number: 09-17-11  
 Rule ID(s): 5020  
 File Date: 09/23/2011  
 Effective Date: 12/22/2011

## Rulemaking Hearing Rule(s) Filing Form

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205*

<b>Agency/Board/Commission:</b>	Tennessee Department of Finance and Administration
<b>Division:</b>	Bureau of TennCare
<b>Contact Person:</b>	George Woods
<b>Address:</b>	Bureau of TennCare 310 Great Circle Road Nashville, Tennessee
<b>Zip:</b>	37243
<b>Phone:</b>	(615) 507-6446
<b>Email:</b>	George.woods@tn.gov

**Revision Type (check all that apply):**

- Amendments  
 New  
 Repeal

**Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)**

Chapter Number	Chapter Title
1200-13-14	TennCare Standard
Rule Number	Rule Title
1200-13-14-.04	Covered Services
1200-13-14-.10	Exclusions
1200-13-14-.11	Appeal of Adverse Actions Affecting TennCare Services or Benefits

Chapter Number	Chapter Title
1200-13-14	TennCare Standard
Rule Number	Rule Title
1200-13-14-.04	Covered Services
1200-13-14-.10	Exclusions
1200-13-14-.11	Appeal of Adverse Actions Affecting TennCare Services or Benefits

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

The seventh paragraph of the "BENEFIT FOR PERSONS AGED 21 AND OLDER" column of Part 25. of Subparagraph (b) of Paragraph (1) of Rule 1200-13-14-.04 Covered Services is deleted in its entirety and replaced with a new seventh paragraph which shall read as follows:

SERVICE	BENEFIT FOR PERSONS UNDER AGE 21	BENEFIT FOR PERSONS AGED 21 AND OLDER
		<p><del>Over-the-counter drugs for Medicaid adults are not covered even if the enrollee has a prescription for such service, except for prenatal vitamins for pregnant women.</del></p> <p><u>Over-the-counter (OTC) drugs for TennCare adults are not covered even if the enrollee has a prescription for such service, unless the drug is listed on the "Covered OTC Drug List" that is available on the TennCare website located at <a href="http://www.tn.gov/tenncare">www.tn.gov/tenncare</a> on the date of service.</u></p>

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Part 5. "Agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d." of Subparagraph (c) of Paragraph (1) of Rule 1200-13-14-.04 Covered Services is deleted in its entirety and subsequent Parts renumbered accordingly.

(c) Pharmacy

TennCare is permitted under the terms and conditions of the demonstration project approved by the federal government to restrict coverage of prescription and non-prescription drugs to a TennCare-approved list of drugs known as a drug formulary. TennCare must make this list of covered drugs available to the public. Through the use of a formulary, the following drugs or classes of drugs, or their medical uses, shall be excluded from coverage or otherwise restricted by TennCare as described in Section 1927 of the Social Security Act [42 U.S.C. §1396r-8]:

1. Agents for weight loss or weight gain.
2. Agents to promote fertility or for the treatment of impotence or infertility or for the reversal of sterilization.
3. Agents for cosmetic purposes or hair growth.
4. Agents for symptomatic relief of coughs and colds.

- ~~5.~~ Agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d.
- 6-5. Agents which are benzodiazepines or barbiturates.
- 7-6. Prescription vitamins and mineral products, except prenatal vitamins and fluoride preparations.
- 8-7. Nonprescription drugs.
- 9-8. Covered outpatient drugs, which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or his designee.

TennCare shall not cover drugs considered by the FDA to be Less Than Effective (LTE) and DESI drugs, or drugs considered to be Identical, Related and Similar (IRS) to DESI and LTE drugs or any other pharmacy services for which federal financial participation (FFP) is not available. The exclusion of drugs for which no FFP is available extends to all TennCare enrollees regardless of the enrollee's age. TennCare shall not cover experimental or investigational drugs which have not received final approval from the FDA.

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Subpart (v) "Agents when used to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. §1396d" of Part 20. of Subparagraph (a) of Paragraph (3) of Rule 1200-13-14-.10 Exclusions is deleted in its entirety and subsequent Parts are renumbered accordingly.

(3) Specific exclusions. The following services, products, and supplies are specifically excluded from coverage under the TennCare Section 1115 waiver program unless excepted by paragraph (2) herein. Some of these services may be covered under the CHOICES program or outside TennCare under a Section 1915(c) Home and Community Based Services waiver when provided as part of an approved plan of care, in accordance with the appropriate TennCare Home and Community Based Services rule.

(a) Services, products, and supplies that are specifically excluded from coverage except as medically necessary for children under the age of 21.

20. Certain pharmacy items as follows:

- (i) Agents when used for anorexia or weight loss
- (ii) Agents when used to promote fertility
- (iii) Agents when used for cosmetic purposes or hair growth
- (iv) Agents when used for the symptomatic relief of cough and colds
- ~~(v)~~ Agents when used to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d
- ~~(vi)~~(v) Covered outpatient drugs which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or its designee
- ~~(vii)~~(vi) Nonprescription drugs
- ~~(viii)~~(vii) Barbiturates
- ~~(ix)~~(viii) Benzodiazepines

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

Subpart (v) "agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d," of Part 2. of Subparagraph (b) of Paragraph (5) of Rule 1200-13-13-.11 Appeal of Adverse Actions Affecting TennCare Services or Benefits is deleted in its entirety and subsequent Subparts are renumbered accordingly.

- (b) A pharmacist shall dispense a seventy-two (72) hour interim supply of the prescribed drug, as mandated by the preceding paragraph, provided that:
2. The medication is not a drug in one of the non-covered TennCare therapeutic categories that include:
    - (i) agents for weight loss or weight gain;
    - (ii) agents to promote fertility or to treat impotence;
    - (iii) agents for cosmetic purposes or hair growth;
    - (iv) agents for the symptomatic relief of coughs and colds;
    - ~~(v) agents to promote smoking cessation, except such agents shall be covered for pregnant women in accordance with 42 U.S.C. § 1396d;~~
    - (vi)(v) prescription vitamins and mineral products except prenatal vitamins and fluoride preparations;
    - ~~(vii)(vi)~~ nonprescription drugs;
    - ~~(viii)(vii)~~ covered outpatient drugs which the manufacturer seeks to require as a condition of sale that associated tests or monitoring services be purchased exclusively from the manufacturer or its designee; or
    - ~~(ix)(viii)~~ barbiturates or benzodiazepines.

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105 and 71-5-109.

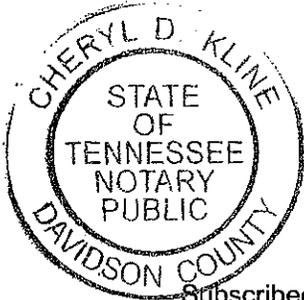
GW10211168R

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Department of Finance and Administration (board/commission/ other authority) on 9/13/11 (mm/dd/yyyy), and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 06/28/2011

Rulemaking Hearing(s) Conducted on: (add more dates). 08/30/2011



Date: 9/13/11

Signature: Wendy Long MD

Name of Officer: Wendy Long, MD

Title of Officer: Chief Medical Officer

Subscribed and sworn to before me on: 9/13/11

Notary Public Signature: Cheryl D Kline

My commission expires on: 9/31/2012

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

RE Cooper, Jr.

Robert E. Cooper, Jr.  
Attorney General and Reporter

9-23-11

Date

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Filed with the Department of State on: 9/23/11

Effective on: 12/22/11

Tre Hargett  
Tre Hargett  
Secretary of State

## G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Finance and Administration

DIVISION: Bureau of TennCare

SUBJECT: CHOICES Group 2

STATUTORY AUTHORITY: Tennessee Code Annotated, Sections 71-5-105 and 71-5-109

EFFECTIVE DATES: September 23, 2011 through March 21, 2012

FISCAL IMPACT: The promulgation of this rule is anticipated to decrease state expenditures \$9,771,034 for fiscal year 2012.

STAFF RULE ABSTRACT: The promulgation of this rule will increase the TennCare enrollment target for CHOICES Group 2 from 9,500 to 11,000.

The Long-Term Care Community Choices Act of 2008, Tennessee Code Annotated, § 71-5-1401, et seq., established the CHOICES program, which permits certain persons who are eligible for long term care in a nursing facility to receive certain services and remain in their homes (CHOICES Group 2).

The Act required the Commissioner to apply for a Medicaid waiver in order to obtain federal financial participation (FFP) for the program. The CHOICES waiver permits the Bureau of TennCare to establish enrollment targets for CHOICES Group 2, but sets a maximum target of 11,000 enrollees for which FFP will be paid in this fiscal year.

The current rule established an enrollment target of 9,500 for CHOICES Group 2. Increased interest in the program has resulted in enrollment rapidly approaching this target. The Bureau anticipates that the additional available federally approved enrollment capacity will be needed effective September 30, 2011.

If the CHOICES Group 2 enrollment target established by rule is not increased, the additional FFP already approved

for enrolling an additional 1,500 persons into CHOICES Group 2 will not be available. The Bureau will not receive FFP for any persons eligible for enrollment into CHOICES Group 2 after the target of 9,500 is reached unless the potential enrollees are placed in CHOICES Group 1, which is higher cost institutional care.

## Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

There is no projected impact on local governments.

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**For Department of State Use Only**

Sequence Number: 09-15-11  
Rule ID(s): 3018  
File Date (effective date): 09/23/2011  
End Effective Date: 03/21/2012

# Emergency Rule Filing Form

*Emergency rules are effective from date of filing for a period of up to 180 days.*

<b>Agency/Board/Commission:</b>	Tennessee Department of Finance and Administration
<b>Division:</b>	Bureau of TennCare
<b>Contact Person:</b>	George Woods
<b>Address:</b>	310 Great Circle Road Nashville, Tennessee
<b>Zip:</b>	37243
<b>Phone:</b>	(615) 507-6446
<b>Email:</b>	<a href="mailto:George.Woods@tn.gov">George.Woods@tn.gov</a>

**Rule Type:**

Emergency Rule

**Revision Type (check all that apply):**

Amendment  
 New  
 Repeal

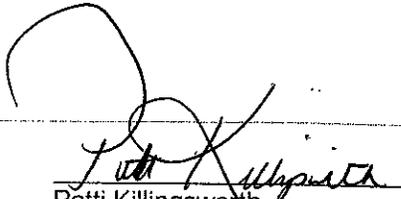
**Statement of Necessity:**

The Long-Term Care Community Choices Act of 2008, T.C.A. §§ 71-5-1401, et seq., established the CHOICES program, which permits certain persons who are eligible for long term care in a nursing facility to receive certain services and remain in their homes (CHOICES Group 2). The Act required the Commissioner to apply for a Medicaid waiver in order to obtain federal financial participation (FFP) for the program. The CHOICES waiver permits the Bureau of TennCare to establish enrollment targets for CHOICES Group 2, but sets a maximum target of 11,000 enrollees for which FFP will be paid in this fiscal year. The current rule established an enrollment target of 9,500 for CHOICES Group 2. Increased interest in the program has resulted in enrollment rapidly approaching this target. The Bureau anticipates that the additional available federally approved enrollment capacity will be needed effective September 30, 2011. If the CHOICES Group 2 enrollment target established by rule is not increased, the additional FFP already approved for enrolling an additional 1,500 persons into CHOICES Group 2 will not be available. The Bureau will not receive FFP for any persons eligible for enrollment into CHOICES Group 2 after the target of 9,500 is reached unless the potential enrollees are placed in CHOICES Group 1, which is higher cost institutional care.

Pursuant to T.C.A. § 4-5-208, the Bureau of TennCare is authorized to adopt an emergency rule if it is required by an agency of the federal government and adoption of the rule through ordinary rulemaking procedures might jeopardize the loss of a federal program or funds.

I have made the finding that the attached amendment is required to prevent the loss of federal funds and the timely implementation of this amendment precludes promulgation through ordinary rulemaking procedures.

For a copy of this emergency rule contact: George Woods at the Bureau of TennCare by mail at 310 Great Circle Road, Nashville, Tennessee 37243 or by telephone at (615) 507-6446.

  
Patti Killingsworth  
Assistant Commissioner  
Chief of Long Term Care  
Bureau of TennCare

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/RuleTitle per row)

Chapter Number	Chapter Title
1200-13-01	TennCare Long-Term Care Programs
Rule Number	Rule Title
1200-13-01-.05	TennCare CHOICES Program

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

Part 1. of Subparagraph (d) of Paragraph (4) of Rule 1200-13-01-.05 TennCare CHOICES Program is amended by adding a new Subpart (iii) which shall read as follows:

(d) Enrollment Target for CHOICES Group 2.

1. There shall be an Enrollment Target for CHOICES Group 2. The Enrollment Target functions as a cap on the total number of individuals who can be enrolled into CHOICES Group 2 at any given time.
  - (i) Effective March 1, 2010, the Enrollment Target for CHOICES Group 2 will be seven thousand five hundred (7,500).
  - (ii) Effective July 1, 2010, the Enrollment Target for CHOICES Group 2 will be nine thousand five hundred (9,500).
  - (iii) Effective September 30, 2011, the Enrollment Target for CHOICES Group 2 will be eleven thousand (11,000).

Statutory Authority: T.C.A. §§ 4-5-208, 71-5-105, 71-5-109.

I certify that this is an accurate and complete copy of an emergency rule(s), lawfully promulgated and adopted.

Date: 9/15/11

Signature: Patti Killingsworth

Name of Officer: Patti Killingsworth

Assistant Commissioner  
Chief of Long Term Care

Title of Officer: Bureau of TennCare



Subscribed and sworn to before me on: September 15, 2011

Notary Public Signature: Robin A. Page

My commission expires on: September 23, 2013

All emergency rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

Robert V. Cooper, Jr.  
Attorney General and Reporter  
9-22-11

Date

**Department of State Use Only**

Filed with the Department of State on: 9/23/11

Effective for: 180 \*days

Effective through: 3/21/12

\* Emergency rule(s) may be effective for up to 180 days from the date of filing.

Tre Hargett

Tre Hargett  
Secretary of State

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