

SOLID WASTE MANAGEMENT

Subchapter 18

TENORM

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Subchapter 18

TENORM

17.50.1801 PURPOSE AND APPLICABILITY (1) The rules in this subchapter are adopted by the department under Title 75, chapter 10, part 2, MCA. The purpose of this subchapter is to establish requirements for the management of TENORM waste at TENORM waste management systems.

(2) This subchapter applies to each applicant, owner, operator, or licensee of a TENORM waste management system that accepts, stores, treats, recycles, recovers, disposes, or transports TENORM waste with a concentration of radium-226 (Ra-226) plus radium-228 (Ra-228), excluding background radiation, equal to or greater than 5.0 picocuries per gram (pCi/g). Wherever there is a requirement imposed on an owner or operator in this subchapter, the licensee also shall comply with that requirement.

(3) The owner or operator of an existing waste management system licensed to accept TENORM waste shall comply with these rules by 12 months after June 27, 2020.

(4) The owner or operator of a TENORM waste management system shall also comply with the requirements for a Class II solid waste management system in ARM Title 17, chapter 50, subchapters 4, 5, 10, 11, 12, 13, and 14, except for ARM 17.50.1109 and 17.50.1404(2)(a).

(5) A TENORM waste management system may not accept source material and byproduct material as defined in 42 USC § 2014.

(6) This subchapter does not relieve any owner or operator of the obligation to comply with other applicable federal, state, or local requirements.

(7) The department incorporates by reference "Requirements for the Characterization of TENORM Wastes," Montana DEQ – Solid Waste Program (Revised June 2020). Copies of that document are available for public inspection at the Department of Environmental Quality, 1520 E. 6th Ave., P.O. Box 200901, Helena, MT 59620-0901, or by contacting the department at (406) 444-5300. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1802 DEFINITIONS In this subchapter, the following definitions apply:

(1) "Absorbed dose" has the meaning specified in ARM 37.14.102.

(2) "Background radiation" means the natural radiation that is present in the environment. It includes cosmic radiation, which comes from the sun and stars; terrestrial radiation, which comes from the Earth, and radiation from naturally occurring radioactive materials.

(3) "Contaminated soil" has the meaning specified in ARM 17.50.403.

(4) "Curie" has the meaning specified in ARM 37.14.102.

(5) "Department" means the Department of Environmental Quality.

(6) "Dose" means the amount of radiation energy deposited in human tissue.

(7) "Exposure" is a measure of the amount of ionization produced in air by gamma photons or x-rays.

(8) "Filter media" means a porous material used to filter solids from fluids. This includes, but is not limited to, green anthracite, filter socks, water treatment socks, and activated charcoal.

(9) "Facility" has the meaning specified in ARM 17.50.502.

(10) "Health physicist" means a scientist or engineer that has sufficient training and experience to make sound professional judgments regarding radiation monitoring, equipment, environmental protection, health, and safety. The training and experience must pertain to naturally occurring radioactive materials and health physics concerning protecting people and the environment from potential radiation hazards. Sufficient training and experience is gained through a baccalaureate and/or post-graduate degree in the natural sciences or engineering, professional certifications, and work experience.

(11) "Landfill" has the meaning specified in ARM 17.50.502.

(12) "Leachate" has the meaning specified in ARM 17.50.502.

(13) "Leachate collection system" has the meaning specified in ARM 17.50.502.

(14) "Leachate removal system" has the meaning specified in ARM 17.50.502.

(15) "Licensed boundary" has the meaning specified in ARM 17.50.502.

(16) "Load" is a measured quantity of waste prepared for or being transported at any one time.

(17) "Method of receipt" means the name of the transporter and equipment used to deliver the waste to the TENORM waste management system.

(18) "Microroentgen" (μR) is one millionth of a roentgen.

(19) "Millirem" (mrem) means a unit of equivalent dose that is equal to one thousandth of a rem.

(20) "Milliroentgen" (mR) means a unit of measurement for radiation exposure that is one thousandth of a roentgen.

(21) "Picocuries" is a unit of radioactivity that is one trillionth of a curie.

(22) "Qualified ground water scientist" has the meaning specified in ARM 17.50.1302.

(23) "Radiation" means alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles with sufficient kinetic energy to strip electrons from atoms. Radiation does not include non-ionizing radiation, such as radio or microwaves, or visible, infrared, or ultraviolet light.

(24) "Rem" or "roentgen equivalent man" is the dose unit representing the amount of energy absorbed in human tissue, the distribution of the energy, and the sensitivity of the whole body or individual organs to radiation.

(25) "Roentgen" (R) is the unit of measurement for x-radiation or gamma radiation producing one electrostatic unit of positive or negative ionic charge in one cubic centimeter of air under standard pressure or 0.000258 coulombs per kilogram of dry air.

(26) "Screening" means the examination and measurement procedures to verify that incoming waste meets the acceptance criteria for the waste management system.

(27) "Solid waste" has the meaning specified in ARM 17.50.403.

(28) "Solid waste management system" has the meaning specified in ARM 17.50.403.

(29) "Source" means the location where the TENORM waste is generated or, if aggregated, the location where the last aggregation occurs.

(30) "Spill" means the accidental or unintentional release of TENORM waste during transport or onsite at the TENORM waste management system in an area not designated for disposal.

(31) "Storage" has the meaning specified in ARM 17.50.403.

(32) "Technologically enhanced naturally occurring radioactive material" (TENORM) means naturally occurring radioactive material whose radionuclide concentrations are increased by or as a result of past or present human practices. TENORM does not include background radiation or the natural radioactivity of rocks and soils. TENORM does not include "source material" and "byproduct material," as both are defined in 42 USC § 2014, a section of the Atomic Energy Act of 1954.

(33) "TENORM surface-contaminated objects" means objects that have TENORM distributed on either the external or internal surfaces, or both, including but not limited to pipes, valve stems, and equipment or survey instruments.

(34) "TENORM waste" is solid waste that contains TENORM.

(35) "TENORM waste management system" means a system that accepts, stores, treats, recycles, recovers, disposes, or transports TENORM waste. Such a system may be composed of one or more waste management facilities. This term does not include hazardous waste management systems.

(36) "TENORM waste unit" means a discrete area of land or an excavation used for the landfilling or other disposal of TENORM waste at a TENORM waste management system.

(37) "Total Effective Dose Equivalent" (TEDE) means the overall measured and/or calculated effective dose that takes into account the type of radiation and the nature of each organ or tissue being irradiated.

(38) "Transport" has the meaning specified in ARM 17.50.403.

(39) "Treatment" has the meaning specified in ARM 17.50.403.

(40) "Waste" has the meaning specified in ARM 17.50.502.

(41) "Waste characterization" means the standardized process for analyzing the composition of different waste streams. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1803 TENORM WASTE MANAGEMENT SYSTEM LIMITS AND RESTRICTIONS (1) Except as provided in (2), the owner or operator of a TENORM waste management system shall ensure that:

(a) TENORM waste entering the system does not exceed a gate screening level of 100 microrentgen per hour ($\mu\text{R/hr}$), excluding background, in accordance with ARM 17.50.1808(1)(b);

(b) TENORM waste entering the system does not exceed a concentration of 50 picocuries per gram (pCi/g) of combined radium Ra-226 and Ra-228 determined by the waste characterization requirements in ARM 17.50.1808(1)(d); and

(c) the total effective dose equivalent (TEDE) contributed by the TENORM waste management system does not exceed 100 millirem per year (mrem/y), excluding background radiation, for a hypothetical member of the public who is at the boundary continuously with no shielding for a year, as monitored in accordance with ARM 17.50.1808(1)(l).

(2) TENORM surface-contaminated objects are not subject to the waste characterization requirement in (1)(b), but must not exceed the gate screening level in (1)(a).

(3) Before accepting a load of TENORM waste, the owner or operator of a TENORM waste management system shall:

(a) obtain a manifest from the transporter that includes the following:

(i) name of generator(s) or aggregator(s);

(ii) address of generator(s) or aggregator(s);

(iii) vehicle license number;

(iv) U.S. Department of Transportation number associated with the truck and company;

(v) name of transporter;

(vi) name of driver;

(vii) transporter's company address;

(viii) transporter's company phone number;

(ix) transporter's email address;

(x) identification of the source location(s), volume, physical state, and type;

(xi) date and time of the delivery of the waste;

(xii) identification of the process(es) producing the waste;

(xiii) method of receipt; and

(xiv) waste characterization results, which may be provided on associated documents.

(b) ensure that the TENORM waste has been characterized in compliance with ARM 17.50.1808(1)(d).

(4) The owner or operator of a TENORM waste management system shall conduct additional testing of other constituents of the waste stream if the department determines the additional testing is necessary to protect human health and the environment.

(5) If a person attempts to deliver for disposal TENORM waste exceeding the gate screening limit in (1)(a) or the concentration limit in (1)(b), the owner or operator of the TENORM waste management system shall:

- (a) refuse to accept the waste;
- (b) record the source, amount, name of the generator, and other identifying information about the rejected waste; and
- (c) notify the department and generator in writing with the information in (b) within 24 hours after waste rejection.

(6) If the owner or operator of a TENORM waste management system or the department determines that the limit in (1)(c) has been exceeded, the owner or operator shall:

- (a) immediately stop accepting TENORM waste;
- (b) within 24 hours after the determination, or notification by the department, place a notice in the operating record indicating the exceedance and notify the department electronically or by telephone that this notice was placed in the operating record; and
- (c) within 15 days after the determination, or notification by the department, submit for department approval a corrective action plan and follow the closure and post-closure care requirements of ARM 17.50.1812 if determined necessary by the department to protect human health and the environment.

(7) The corrective action plan required in (6)(c) must:

- (a) include corrective measures that will enable the TENORM waste management system to meet the requirements in (1)(c);
- (b) prohibit the acceptance of TENORM waste until the corrective measures have remedied the exceedance; and
- (c) establish a department-approved timeframe on a case-by-case basis for implementing the proposed corrective action plan.

(8) The owner or operator of a TENORM waste management system may not allow disposal of bulk or non-containerized liquid waste.

(9) A person may dispose of TENORM waste that exceeds a limit in (1)(a) or (b) only in a disposal facility licensed to receive waste that exceeds one or both of those limits. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

Rules 17.50.1804 and 17.50.1805 reserved

17.50.1806 TENORM WASTE MANAGEMENT SYSTEM LICENSE AND APPLICATION REQUIREMENTS (1) A person may not construct, expand, or operate a TENORM waste management system after June 27, 2020 without first obtaining a TENORM waste management system license from the department in compliance with ARM Title 17, chapter 50, subchapters 4 and 5 and this subchapter.

(2) An applicant for a TENORM waste management system license shall use the application form provided by the department. In addition to the information required under ARM 17.50.508, the applicant shall provide the following information:

(a) a document signed by the landowner that grants access to the property to the department, private contractors, and the waste management system owner/operator to perform activities associated with regulation and operation of the TENORM waste management system;

(b) technical design specifications;

(c) construction plans;

(d) a detailed site plan that includes:

(i) information concerning any material that will be used to construct a liner or berm, including but not limited to:

(A) type, quantity, and source of waste to be accepted;

(B) compaction density;

(C) moisture content;

(D) design permeability;

(E) liner construction quality assurance and quality control (QA/QC) plans;

(ii) design and location of any proposed storage or treatment areas;

(iii) design and location of any liquid containment or storage structures;

(iv) design, location, and grades of any surface water diversion and drainage structures;

(e) an operation and maintenance plan that complies with ARM 17.50.1808;

(f) a ground water monitoring plan that complies with ARM 17.50.1811; and

(g) a closure plan and a post-closure care plan that complies with ARM 17.50.1812. (History: 75-10-204, MCA; IMP, 75-10-204, 75-10-221, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1807 DESIGN CRITERIA (1) An application for a TENORM waste management system license must contain a system design that complies with:

(a) ARM Title 17, chapter 50, subchapter 10;

(b) ARM Title 17, chapter 50, subchapter 12; and

(c) requirements of the Montana Pollutant Discharge Elimination System (MPDES) general storm water permit approved by the department's Water Protection Bureau.

(2) The design must also include an appropriate number and placement of dose measuring devices as determined by a health physicist. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1808 OPERATION AND MAINTENANCE (1) An application for a TENORM waste management system license must contain an operation and maintenance plan that complies with ARM Title 17, chapter 50, subchapters 5 and 11, excluding ARM 17.50.1109, and that includes:

- (a) types of wastes that will be accepted;
- (b) procedures and equipment that accurately measure radiation exposure that will be used for gate screening;
- (c) procedures for onsite sampling and testing;
- (d) procedures for waste characterization that:
 - (i) comply with "Requirements for the Characterization of TENORM Wastes" Montana DEQ – Solid Waste Program (Revised June 2020); and
 - (ii) state how results must be recorded, utilized, and maintained;
- (e) documentation of exposure rates measured onsite at the time of delivery in accordance with ARM 17.50.1803(1)(a);
- (f) procedures for rejecting waste;
- (g) procedures for dust monitoring and control;
- (h) an inventory of radiation survey equipment;
- (i) calibration procedures for radiation detection and monitoring equipment and documentation of calibration records, including:
 - (i) annual calibration for radiation detection and monitoring instruments done by a laboratory licensed by an agreement state or NRC; and
 - (ii) daily source and background check procedures for radiation detection and monitoring equipment, as appropriate;
- (j) a radiation health and safety plan developed by a health physicist to provide onsite facility knowledge necessary to comply with the requirements of this subchapter and protect public health;
- (k) provisions to minimize noise impacts on residential areas to the degree practicable through berms, vegetation screens, and reasonable limits on hours of operation;
- (l) provisions developed by a health physicist for continuous monitoring of ionizing radiation dose at the licensed boundary. The monitoring must demonstrate the dose a hypothetical person would receive if the person were at the boundary continuously with no shielding for a year;
- (m) procedures to protect the integrity of the liner from objects that could compromise it, such as large bulky items; and
- (n) procedures for random inspections of incoming loads and rejection procedures for incoming loads that do not meet the acceptance criteria.

- (2) The owner or operator of a TENORM waste management system shall:
- (a) file an annual report, as required by ARM 17.50.410(1)(b); and
 - (b) submit to the department within 45 days after the end of each calendar quarter a report on TENORM waste delivered during that quarter. The report must contain the following:
 - (i) the date of delivery of each load of TENORM waste during the quarter or a notation that no TENORM waste was delivered during the quarter;
 - (ii) if a load was rejected, the date of attempted delivery, the source of the delivery, and the reason for rejection;
 - (iii) the type of waste and waste characterization results; and
 - (iv) readings taken at the licensed boundary in accordance with (1)(l);
 - (c) make gate-screening documentation available to the department for inspection during normal business hours or as requested;
 - (d) cover the waste by the end of each operating day with at least six inches of clean and compacted soil or an alternative daily cover that has been approved by the department under ARM 17.50.1104;
 - (e) construct, maintain, and operate a TENORM waste management system in conformance with the requirements of this subchapter, the operation and maintenance plan, and all other plans approved by the department; and
 - (f) maintain records required in this subchapter in accordance with ARM 17.50.1112 and make them available for inspection by the department during business hours or as requested.
- (3) The owner or operator of a TENORM waste management system may not accept TENORM waste unless the owner or operator has designed, constructed, and maintained:
- (a) a run-on control system to divert storm water to prevent flow of storm water onto the active portion of the landfill during the peak discharge from a 24-hour, 100-year storm;
 - (b) a system to control run-off from the active portion of the landfill by collecting and controlling at least the water volume resulting from a 24-hour, 100-year storm; and
 - (c) a system to manage storm water run-off in accordance with ARM 17.50.1110(1).
- (4) The owner or operator of a TENORM waste management system shall monitor storm water ponds annually for constituents and parameters determined by the department to be appropriate based on the waste stream accepted.
- (5) If monitoring in (4) detects an exceedance of a constituent or parameter, the owner or operator of a TENORM waste management system shall notify the department's Water Protection Bureau and implement necessary corrective actions. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

Rules 17.50.1809 and 17.50.1810 reserved

17.50.1811 GROUND WATER MONITORING (1) An application for a TENORM waste management system license must contain a ground water monitoring plan that complies with ARM Title 17, chapter 50, subchapter 13; and contain a ground water sampling and analysis plan tailored to the types of TENORM waste being managed and site-specific conditions.

(2) During the active life of the waste management system and the closure and post-closure periods, a TENORM waste management system owner or operator shall have an independent qualified ground water scientist conduct semiannual monitoring for all constituents and parameters required in the ground water sampling and analysis plan and this rule.

(3) During the first semiannual monitoring event, a minimum of four independent samples must be collected from each background and downgradient well and analyzed in accordance with this rule.

(4) During subsequent semiannual monitoring events, a minimum of one sample must be collected from each background and downgradient well and analyzed in accordance with this rule.

(5) If the department determines that monitoring at an increased frequency is necessary to protect human health or the environment and notifies the owner or operator, the owner or operator shall monitor at the frequency determined by the department.

(6) The owner or operator of the TENORM waste management system shall monitor ground water for the constituents listed in ARM 17.50.1306 for Class II and Class IV landfills, the constituents in Table 1 of this rule, and any other constituent for which the department determines monitoring is necessary to protect public health or the environment.

Table 1
Ground Water Monitoring Constituents

Regulated Radionuclide	Exceedance Concentrations Above Background Radiation
Gross alpha (excluding uranium and radon)	15 pCi/L
Combined Ra-226 and Ra-228	5 pCi/L
Uranium	30 micrograms per liter (µg/L)

(7) If monitoring detects results in an exceedance for any constituent identified in the ground water sampling and analysis plan and this rule, the owner or operator of the TENORM waste management system shall implement an assessment monitoring program and take corrective action under ARM Title 17, chapter 50, subchapter 13. (History: 75-10-204, MCA; IMP, 75-10-204, 75-10-207, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1812 CLOSURE AND POST-CLOSURE CARE REQUIREMENTS

- (1) An application for a TENORM waste management system license must contain closure and post-closure plans that comply with ARM Title 17, chapter 50, subchapter 14, except for ARM 17.50.1404(2)(a), and that include:
- (a) an estimated timeline and methods for closure and post-closure;
 - (b) procedures for removal of any remaining TENORM wastes that have not been disposed of, and final disposal location;
 - (c) procedures for equipment removal, including any necessary equipment decontamination and remediation procedures, and final disposal that is protective of human health and the environment;
 - (d) closure of site buildings and appurtenances;
 - (e) a process for soil sampling and analysis to identify potential areas of soil contaminated by system operations;
 - (f) procedures for excavation and removal or remediation of stained or contaminated soil, with confirmation sampling procedures and analysis to demonstrate that human health and the environment is being protected; and
 - (g) a proposed final closure date.
- (2) Prior to the commencement of closure activities, the owner or operator of a TENORM waste management system shall submit a Notice of Intent to Close to the department.
- (3) The owner or operator of a TENORM waste management system shall complete closure activities as described in the closure plan within 180 days after submittal of the Notice of Intent to Close.
- (4) The owner or operator of a TENORM waste management system shall comply with any other post-closure care requirements determined by the department to be necessary to protect human health or the environment.
- (5) Design of the final cover for a TENORM waste management system must ensure that, immediately after closure, the TEDE from all TENORM radionuclides does not exceed 25 mrem/y, excluding background radiation, at the licensed boundary.
- (6) The owner or operator of a TENORM waste management system shall ensure that the limit in (5) is met immediately after closure. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

17.50.1813 FINANCIAL ASSURANCE (1) The owner or operator of a TENORM waste management system shall comply with the requirements of ARM 17.50.540 concerning financial assurance for Class II landfills. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)

Rules 17.50.1814 and 17.50.1815 reserved

17.50.1816 TENORM SPILL REPORTING REQUIREMENTS (1) A person who transports TENORM waste for processing or disposal shall comply with this rule.

(2) A person who transports TENORM waste shall comply with ARM 17.50.523.

(3) A person who spills TENORM waste shall, as soon as practicable but in no case later than 24 hours after the spill occurs, report the spill to the Montana Disaster and Emergency Services at (406) 324-4777 and to the county coordinator of disaster and emergency services for the county where the spill occurs.

(4) Notification to the National Response Center may be required by other authority. The National Response Center may be reached at 800-424-8802.

(5) Nothing in this subchapter excuses compliance with permits, rules, or regulations of other state, local, or federal agencies.

(6) A person who spills one cubic yard or more of TENORM waste shall properly and expeditiously manage, contain, and remove all spills of TENORM wastes. (History: 75-10-204, MCA; IMP, 75-10-204, MCA; NEW, 2020 MAR p. 1118, Eff. 6/27/20.)