

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Hazardous Materials and Waste Management Division

RADIATION CONTROL - REGISTRATION AND LICENSING OF TECHNOLOGICALLY ENHANCED NATURALLY OCCURRING RADIOACTIVE MATERIAL (TENORM)

6 CCR 1007-1 Part 20

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

Adopted by the Board of Health on November 18, 2020. Effective January 14, 2021.

Persons subject to this rule shall be compliant with this Part on or before July 14, 2022.

Part 20 REGISTRATION AND LICENSING OF TECHNOLOGICALLY ENHANCED NATURALLY OCCURRING RADIOACTIVE MATERIAL (TENORM)

20.1 Purpose and Scope.

20.1.1 Authority.

- A. Rules and regulations set forth herein are adopted pursuant to the provisions of sections 25-11-104, CRS.

20.1.2 Basis and Purpose.

- A. A statement of basis and purpose accompanies this part and changes to this Part. A copy may be obtained from the Department.

20.1.3 Scope.

- A. This Part establishes requirements and provisions for the generation, handling, processing, transfer, receipt, transportation, disposal, possession, distribution, and beneficial use of technologically enhanced naturally occurring radioactive materials (TENORM) and for the registration and issuance of licenses authorizing these activities. These requirements and provisions provide for the protection of public health and radiation safety of workers and the general public.
- B. Requirements and provisions in this Part 20 become enforceable July 14, 2022.
- C. Nothing in this part relieves any person from complying with other local, state, and federal laws, regulations, ordinances, and other requirements governing materials that may contain TENORM.

20.1.4 Applicability.

- A. The requirements and provisions of these regulations apply to any person who generates, handles, processes, transfers, receives, transports, disposes of, possesses, distributes, or beneficially uses TENORM unless specifically exempted.
- B. Source material is not subject to the requirements or provisions of this Part.

20.1.5 Published material incorporated by reference.

- A. Throughout this Part 20, federal regulations, state regulations, and standards or guidelines of outside organizations have been adopted and incorporated by reference. Unless a prior version of the incorporated material is otherwise specifically indicated, the materials incorporated by reference cited herein include only those versions that were in effect as of the most recent effective date of this Part 20 (January 2021), and not later amendments or editions of the incorporated material, with the following exception:
 - 1. Only the version of the Department of Natural Resources Oil and Gas Conservation Commission rules, 2 CCR 404-1, that were adopted as of the effective date of this Part 20 applies to this Part 20; later amendments or versions do not apply.
- B. Materials incorporated by reference are available for public inspection, and copies (including certified copies) can be obtained at reasonable cost, during normal business hours from the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, 4300 Cherry Creek Drive South, Denver, Colorado 80246. Additionally, <https://www.colorado.gov/cdphe/radregs> identifies where the incorporated materials are available to the public on the internet at no cost. Due to copyright restrictions certain materials incorporated in this Part are available for public inspection at the state publications depository and distribution center.
- C. Availability from Source Agencies or Organizations.
 - 1. All federal agency regulations incorporated by reference herein are available at no cost in the online edition of the Code of Federal Regulations (CFR) hosted by the U.S. Government Printing Office, online at www.govinfo.gov.
 - 2. All state regulations incorporated by reference herein are available at no cost in the online edition of the Code of Colorado Regulations (CCR) hosted by the Colorado Secretary of State's Office, online at <https://www.sos.state.co.us/CCR/RegisterHome.do>.
 - 3. Copies of the standards or guidelines of outside organizations are available either at no cost or for purchase from the source organizations listed below.
 - a. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
<https://www.epa.gov/hw-sw846/sw-846-compendium>
 - b. U.S. Postal Service
475 L'Enfant Plaza, SW Room 4012
Washington, DC 20260-2200
<https://pe.usps.com/DMM300/Index>

20.2 Definitions.

As used in this part, these terms have the definitions set forth as follows:

“Agreement State” means any State with which the U.S. Nuclear Regulatory Commission or the U.S. Atomic Energy Commission has entered into an effective agreement under subsection 274b. of the Atomic Energy Act of 1954, as amended (73 Stat. 689).

“Background radiation” means radiation from:

- A. Extraterrestrial sources;
- B. Naturally occurring radioactive material (which has not been technologically enhanced), including radon (except as a decay product of source or special nuclear material); and
- C. Global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that are not under the control of the licensee or registrant.

Background radiation does not include sources of radiation from radioactive materials regulated by NRC.

“Beneficial Use” means:

- A. The use of solid waste as an ingredient in a manufacturing process, or as an effective substitute for natural or commercial products, in a manner that does not pose a threat to human health or the environment. Avoidance of processing or disposal cost alone does not constitute beneficial use; or
- B. The use of the nutrients and/or organic matter in biosolids to act as a soil conditioner or fertilizer for the promotion of vegetative growth on land; or
- C. The use of the nutrients and/or moisture in water treatment residuals to act as a soil conditioner or low grade fertilizer for the promotion of vegetative growth on the land.

“Biosolids” means the accumulated treated residual product resulting from a domestic wastewater treatment works. Biosolids does not include grit or screenings from a wastewater treatment works, commercial or industrial sludges (regardless of whether the sludges are combined with domestic sewage), sludge generated during treatment of drinking water, or domestic or industrial septage.

“Byproduct material” 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 using 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 or thorium 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, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; or
 - 2. Any material that:
 - a. Has been made radioactive by use of a particle accelerator; and

- b. Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, 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 NRC, 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; and
 - 2. Before, on, or after August 8, 2005, is extracted, or converted after extraction, for use for a commercial, medical, or research activity;

“Centralized E&P waste management facility” means a facility, other than a commercial disposal facility regulated by the Colorado Department of Public Health and Environment, that (1) is either used exclusively by one owner or operator or used by more than one operator under an operating agreement; and (2) is operated for a period greater than three (3) years; and (3) receives for collection, treatment, temporary storage, and/or disposal produced fluids, produced water, drilling fluids, completion fluids, and any other E&P wastes that are generated from two or more production units or areas or from a set of commonly owned or operated leases. This definition includes oil-field naturally occurring radioactive materials (NORM) related storage, decontamination, treatment, or disposal.

“Class II UIC well” means wells which inject fluids:

- A. Which are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection; and
- B. For enhanced recovery of oil or natural gas.

“Commercial composting facility” means any solid waste composting facility that accepts a fee for solid waste composting, or any solid waste composting facility that composts solid waste to create a compost or soil amendment and distributes the finished compost or soil amendment offsite for a fee.

“Compost” means the material or product which is developed under controlled conditions and which results from biological degradation processes by which organic wastes decompose.

“Composting” means the biological process of degrading organic materials that is facilitated and controlled through intentional and active manipulation. These manipulations may include but are not limited to grinding, mixing of feed stocks and bulking materials, addition of liquids, turning of piles, vermicomposting, or mechanical manipulation.

“Compost facility” means a site where compost is produced.

“Compost feedstock” or “Feedstock” means any decomposable organic material used in the production of compost or chipped and ground material including, but not limited to, green wastes, animal material, manure, biosolids, and solid waste.

“Department” means the Colorado Department of Public Health and Environment.

“Domestic wastewater treatment plant” (wastewater treatment plant) means an arrangement of devices and structures for treating, neutralizing, stabilizing, or disposing of domestic wastewater, industrial wastes, and biosolids. A domestic wastewater treatment plant is one type (or element) of domestic wastewater treatment works. The term “domestic wastewater treatment plant” does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein.

“Domestic wastewater treatment works” means a system or facility for treating, neutralizing, stabilizing, or disposing of domestic wastewater which system or facility has a designed capacity to receive more than two thousand gallons of domestic wastewater per day. The term “domestic wastewater treatment works” also includes appurtenances to such system or facility, such as outfall sewers and pumping stations, and to equipment relating to such appurtenances. The term “domestic wastewater treatment works” does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial processes are treated therein.

“Drilling fluid” means a mixture of clay and other chemicals with oil or water that is circulated around the drill bit in oil-well drilling in order to lubricate and cool the bit, flush rock cuttings to the surface, and plaster the side of the well to prevent cave-ins.

“Dry weight” means the mass of materials excluding the mass of any water or moisture present within the materials.

“Exploration and production waste (E&P waste)” means those wastes associated with operations to locate or remove oil or gas from the ground or to remove impurities from such substances and which are uniquely associated with and intrinsic to oil and gas exploration, development, or production operations that are exempt from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 USC Sections 6921, et seq. For natural gas, primary field operations include those production-related activities at or near the wellhead and at the gas plant (regardless of whether or not the gas plant is at or near the wellhead), but prior to transport of the natural gas from the gas plant to market. In addition, uniquely associated wastes derived from the production stream along the gas plant feeder pipelines are considered E&P wastes, even if a change of custody in the natural gas has occurred between the wellhead and the gas plant. In addition, wastes uniquely associated with the operations to recover natural gas from underground storage fields are considered to be E&P waste.

“Final product” or “Final product material” means a finished soil amendment, compost or fertilizer which is intended for beneficial use and which contains a biosolids component.

“Flowline” means a segment of pipe transferring oil, gas, or condensate between a wellhead and processing equipment to the load point or point of delivery to a U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration or Colorado Public Utilities Commission regulated gathering line or a segment of pipe transferring produced water between a wellhead and the point of disposal, discharge, or loading. This definition of flowline does not include a gathering line.

“Gathering line” means a gathering pipeline or system as defined by the Colorado Public Utilities Commission, Regulation No. 4, 4 C.C.R. 723-4901, Part 4, (4 C.C.R. 723-4901) or a pipeline regulated by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration pursuant to 49 C.F.R. §§ 195.2 or 192.8. 49 C.F.R. §§ 195.2 or 192.8 and 4 C.C.R. 723-4901 in existence as of the date of this regulation and does not include later amendments.

“Household waste” means any solid waste generated by households, including single and multiple residences, and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day use recreation areas.

“Land application” means the beneficial use method by which E&P wastes, biosolids, or other water treatment residuals are spread upon or sometimes mixed into soils.

“Land treatment” means the method by which E&P Waste is treated ex situ at the land surface to result in a reduction of hydrocarbon concentration by biodegradation and other natural attenuation processes. Land Treatment may be enhanced by tilling, disking, aerating, composting, or adding nutrients or microbes.

“Municipal solid waste landfill (MSWLF)” means a sanitary landfill where one of the main waste streams accepted is municipal waste.

“Natural background” See Background Radiation.

“Naturally occurring radioactive material” (NORM) means any nuclide that is radioactive in its natural physical state and is not manufactured. “Naturally occurring radioactive material” does not include source material, special nuclear material, byproduct material, or by-products of fossil-fuel combustion, including bottom ash, fly ash, and flue-gas emission by-products.

“NRC”. See “Nuclear Regulatory Commission”.

“Nuclear Regulatory Commission” (NRC) means the U.S. Nuclear Regulatory Commission or a duly authorized representative.

“Oil and gas facility” means equipment or improvements used or installed at an oil and gas location for the exploration, production, withdrawal, treatment, or processing of crude oil, condensate, E&P waste, or gas.

“Oil and gas operation” means exploring for oil and gas, including conducting seismic operations and the drilling of test bores; siting, drilling, deepening, recompleting, reworking, plugging, or abandoning a well; producing operations related to any well, including installing flowlines; the generating, transporting, storing, treating, or disposing exploration and production wastes; and any constructing, site preparing, or reclaiming activities associated with such operations.

“Oily waste” means those materials containing unrefined petroleum hydrocarbons in concentrations in excess of the concentration levels in Department of Natural Resources Oil and Gas Conservation Commission rules, 2 CCR 404-1, Table 915-1. Oily waste may include crude oil, condensate, or other materials such as soil, frac sand, drilling fluids, cuttings, and Pit sludge that contain hydrocarbons.

“Pipeline” means a flowline or gathering line.

“Pit” means any natural or man-made depression in the ground used for oil or gas exploration or production purposes. Pit does not include steel, fiberglass, concrete or other similar vessels which do not release their contents to surrounding soils.

“Produced fluids” mean all fluids produced during flowback, initial testing, and completion of the well including, but not limited to, produced water and fluids recovered during drilling, casing cementing, pressure testing, completion, workover, and formation stimulation of all oil and gas wells including production, exploration, injection, service and monitoring wells. Excluding crude oil and natural gas.

“Produced water” means the water (brine) brought up from the hydrocarbon-bearing strata during the extraction of oil and gas, and can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.

“RCRA” means the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. section 6901 et seq.

“Registered material” means TENORM materials, managed by a person registered as per Section 20.5 of this Part, that are not exempt from this Part as per Section 20.4 and are not subject to a specific radioactive materials license as per Section 20.13.

“Release” means any unauthorized discharge of TENORM to the environment over time.

“Sanitary landfill” means a discrete area of land or an excavation for which the final disposal of solid waste employs a method to obtain the most dense volume practicable of the waste and covering with earth or other suitable material. A sanitary landfill may receive household waste, community waste, municipal solid waste, commercial waste, and industrial waste.

“Scale” means a mineral salt deposit that may occur on wellbore tubulars or pipes and components as the saturation of produced fluid is affected by changing temperature and pressure conditions in production conduit. Typical scales are calcium carbonate, calcium sulfate, barium sulfate or barite, strontium sulfate, iron sulfide, iron oxides, iron carbonate, the various silicates and phosphates and oxides, or any of a number of compounds insoluble or slightly soluble in water.

“Spill” means any unauthorized sudden discharge of TENORM to the environment.

“Solid waste disposal site and facility” means the location and/or facility at which the deposit and final treatment of solid wastes occur.

“Source material” means uranium or thorium, or any combination of uranium or thorium, in any physical or chemical form, including ores that contain, by weight, one-twentieth of 1 percent (0.05 percent) or more, of uranium, thorium or any combination thereof. Source material does not include special nuclear material.

“Tank” means a stationary vessel constructed of non-earthen materials (e.g concrete, steel, plastic) that provides structural support and is designed and operated to store produced fluids or E&P waste.

“Tank bottom” means extraneous materials which may settle to the bottoms of tanks.

“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:

- A. Background radiation or the natural radioactivity of rocks or soils;
- B. “Byproduct material” or “source material”, as defined by Colorado statute or rule; or
- C. Enriched or depleted uranium as defined by Colorado or federal statute or rule.

“TENORM Radionuclides” means Radium-226, Radium-228, Lead-210, and Polonium-210.

20.3 General Provisions

20.3.1 Unless otherwise specified, concentration limits within this Part shall be in dry weight and exclude natural background.

- A. Acceptable Natural Background values are either:
 - 1. Established by the Department and may be found on the Department's website;
or

2. For generation, disposal, or beneficial use sites, site specific values may be established and employed. An adequate and acceptable background sample set will provide a mean within +/- 20% of the true average at the 95% confidence level.
- B. Dry weight refers to the mass of a material excluding the mass of any water or moisture present within the material.
1. For the purposes of liquid TENORM sample analysis, unfiltered (total) samples which include both suspended and dissolved solids must be analyzed for activity and shall represent the total dry weight mass of the sample.
 2. Dry weight concentration values shall be expressed in units of activity per mass, most commonly picocuries per gram.
- 20.3.2 Any person who generates a waste, residual product, or other material by way of a process that has the potential to increase the concentration of NORM and as a result may contain concentrated naturally occurring radionuclides must make a TENORM determination to evaluate whether that material is subject to the applicable requirements established in this Part, or if it can be exempted from the requirements according to Section 20.4 of this Part. The TENORM determination shall be made as follows:
- A. The TENORM determination for each material must be made at the point of generation, and at any time in the course of its management that it has, or may have, changed its properties or naturally occurring radionuclide concentration as a result of the processes that generated the materials or other factors that may change the properties of the materials such that the TENORM classification of the material may change.
- B. A person shall use knowledge of the material when making this determination. Acceptable knowledge may include material origin, composition, process knowledge (e.g., radiological, chemical, or physical characterization of feedstocks and other inputs to the production process, including the exclusion of one or more TENORM radionuclides from consideration based on that knowledge); knowledge of products, by-products, and intermediates produced by the process; information on the radiological, chemical, and physical properties of the materials used or produced by the process or otherwise contained in the generated materials; proper characterization of the materials that illustrates the radiological concentrations of TENORM radionuclides within the generated materials; or other reliable and relevant information about the radiological properties of the generated materials (all of which may be used to develop a waste or material profile).
1. Oil and Gas Exploration and Production - An operator may submit a request to the Department for approval of an alternative determination method using consolidated characterization data from multiple locations of generation when materials are produced from the same geologic formation.
- C. Characterization of TENORM materials shall be performed using appropriate and standard methods such as EPA Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (SW-846) or equivalent alternative methods recognized by the Department. Alternative characterization methods may be submitted to the Department for review and approval. Approved alternatives will be maintained within Department guidance and available on the Department website.

20.3.3 Any person who shall make, or cause to be made, surveys of areas or materials, or other measurements which are necessary to comply with or to evaluate or determine applicability of any section of this Part shall ensure that instruments and equipment used for quantitative radiation measurements, for example, radiation dose rate or levels of non-fixed contamination, are:

- A. Calibrated at intervals not to exceed 12 months for the radiation measured unless otherwise approved by the Department;
- B. Are appropriate for the radiation being measured; and
- C. Have minimum detection capabilities adequate to demonstrate compliance or make a regulatory determination.

20.3.4 The Department may incorporate into any registration or license at the time of issuance, or thereafter by appropriate rule, regulation, or order, such additional requirements and conditions with respect to the licensee or registrant's receipt, possession, use, transfer, or disposal of radioactive material subject to this Part, as it deems appropriate or necessary in order to:

- A. Minimize danger to public health and safety, workers, or property; and
- B. Prevent loss or theft of material subject to this Part.

20.4 Exemptions.

TENORM materials that qualify for exemption in accordance with any one of the following exemption categories are exempt from this rule and do not need to meet the requirements of any other exemption category.

20.4.1 Exempt Concentrations.

- A. Persons who generate, handle, process, transfer, receive, transport, dispose of, possess, distribute, or beneficially use TENORM are exempt from the requirements of this part if the materials contain or are contaminated at concentrations in dry weight not in excess of those listed in Table 20 – 1 excluding natural background. The radioactive progeny of the isotopes present in exempt TENORM are also exempt.

**Table 20 – 1
Exempt TENORM Concentrations**

Isotope	Picocuries/gram (pCi/g)
Radium-226	5
Radium-228	5
Lead-210	5
Polonium-210	5

20.4.2 Exempt Quantities.

- A. Persons who generate, handle, process, transfer, receive, transport, dispose of, possess, distribute, or beneficially use TENORM are exempt from the requirements of this part if the materials are in individual quantities each of which does not exceed the applicable quantity set forth in Table 20 – 2. The radioactive progeny of the isotopes present in exempt TENORM are also exempt.

Table 20 – 2
Exempt TENORM Quantities

Isotope	Microcuries (μCi)
Radium-226	0.1
Radium-228	0.1
Lead-210	0.1
Polonium-210	0.1

- 20.4.3 Household waste containing TENORM is exempt from the requirements of this Part.
- 20.4.4 Consumer goods or products such as tobacco products or building materials are exempt from the requirements of this Part.
- 20.4.5 Waste pipe generated by oil and gas exploration and production, midstream, or downstream related activities or by other industrial activities that may contain TENORM as scale shall be exempt from this Part if:
- A. The pipe is no longer than 50 feet in length, or the pipe is cut to individual sections no longer than 50 feet in length; and
 - B. Each pipe section exhibits no measured radiation dose rate distinguishable from natural background when measured on contact with both the exterior surface and each accessible surface of the interior of the pipe section with a portable radiation detector; and
 - C. For each pipe section used for transfer or processing of natural gas, the level of non-fixed alpha contamination of each accessible interior surface does not exceed 600 disintegrations per minute per 100 square centimeters (600 dpm/100 cm²).
- 20.4.6 Transportation: Common and contract carriers, freight forwarders, and warehouse workers which are subject to the requirements of the DOT in 49 CFR 170 through 189 (2020), or the U.S. Postal Service in the Postal Service Manual (Domestic Mail Manual), are exempt from the requirements of this Part to the extent that they transport or store radioactive material in the regular course of their carriage for others or storage incident thereto.
- 20.4.7 The Department may, upon application or upon its own initiative, grant an exemption or exception from any requirement in this Part as it determines is authorized by law and will not result in undue hazard to public health and safety, workers, or property.
- 20.4.8 No person may, for purposes of rendering materials exempt under the requirements of Section 20.4, purposefully dilute TENORM to reduce the concentration of radionuclides contained within the materials or subdivide TENORM material to reduce the quantity of radionuclides contained within the materials below the exempt limits. Operations which are routine, state of practice, and common within an industry or are required for purposes of the activity being conducted which may inadvertently reduce the concentration of TENORM but are not performed for the express purpose of rendering a material exempt are not prohibited.

Registration

20.5 Persons who generate, handle, process, transfer, receive, transport, dispose of, possess, distribute, or beneficially use TENORM not exempt from this Part as per Section 20.4 and not subject to a specific radioactive materials license as per Section 20.13 shall register with the Department. TENORM materials that are included within a specific radioactive materials license authorization do not require registration under this section. A registrant may capture multiple activities (generation, beneficial use, acceptance for disposal, etc.) and types of Non-Exempt TENORM materials under one registration.

20.5.1 All persons subject to registration shall register annually with the Department and shall pay the fee required by 6 CCR 1007-1 Part 12.

- A. Initial registration shall take place within 90 days of any activity which requires registration per Section 20.5.
- B. The registrant shall furnish the following information and any other information specifically requested by the Department:
 - 1. Name and mailing address;
 - 2. Name, title, telephone number, and email address of the responsible person designated as a representative of the registrant;
 - 3. Address or location information (Public Land Survey System (PLSS) Township/Range, Section, and Quarter-Quarter Section (Lot/Tract)) at which the TENORM is located;
 - 4. Registrant type or a description of the process or activity that generates the TENORM. A registrant may include multiple types of activities within one registration;
 - 5. A description of the TENORM including the amount or volume and the concentrations of TENORM radionuclides present within the material;
 - 6. A description of any routine or non-routine maintenance that involves the manipulation or handling of the TENORM;
 - 7. Certification by the responsible representative of the registrant that they are aware of the requirements of this Part and will meet all of the applicable requirements.

20.5.2 General Requirements - Any person subject to registration per Section 20.5:

- A. Shall not abandon such TENORM.
- B. Shall secure registered materials from unauthorized removal or access, with the exception of those materials land applied for beneficial use in accordance with this Part.
- C. Shall transfer TENORM in accordance with this Part.
- D. Shall maintain records in accordance with Section 20.10 of this Part.

- E. Shall ensure that registered materials that have been packaged or containerized for transfer or disposal as per this Part shall bear a durable, clearly visible label bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL" when in storage awaiting transfer or disposal.
- F. Is subject to the provisions in Sections 4.51 of 6 CCR 1007-1 Part 4 for reporting theft or loss of registered material but shall be exempt from the other requirements of 6 CCR 1007-1 Part 4 unless otherwise required by this Part. This exemption does not apply to any person who also holds a specific radioactive materials license issued by the Department.
- G. Is subject to the provisions in Section 10.5.1 of 6 CCR 1007-1 Part 10 but shall be exempt from the other requirements in 6 CCR 1007-1 Part 10. This exemption does not apply to any person who also holds a specific radioactive materials license issued by the Department.
- H. Shall only allow employees or contractors under the control and supervision of a registrant to perform routine maintenance on equipment, facilities, and land owned or controlled by the registrant. Maintenance that provides a pathway for exposure different from that found in routine periodic maintenance operations or that increases the potential for additional exposure is not considered routine maintenance and shall not be conducted without a specific radioactive materials license or specific written approval from the Department.
- I. Shall conduct activities so as to minimize contamination of the facility and the environment. When activities involving such TENORM are permanently ceased at any site, if evidence of residual TENORM is identified, the registrant shall notify the Department about such material and may consult with the Department as to the appropriateness of sampling and restoration activities to ensure that any contamination or residual TENORM remaining at the site where registered TENORM was used does not exceed the limits in Table 20-1 or is not likely to result in exposures that exceed the limits in Section 4.61.2 of 6 CCR 1007-1 Part 4. Institutional controls may be required if compliance with Table 20-1 or the limits in Section 4.61.2 of 6 CCR 1007-1 Part 4 is not feasible.
- J. Is prohibited from administering TENORM, or the radiation therefrom, either externally or internally, to human beings except as may be authorized in a specific radioactive materials license.
- K. Shall respond to written requests from the Department to provide information relating to the registration within 30 calendar days of the date of the request, or other time specified in the request.
 - 1. If the registrant 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 Radiation Control Program Manager a written justification for the request.
- L. Shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements.
 - 1. The registrant, through this individual, shall ensure the day-to-day compliance with appropriate regulations and requirements; this appointment does not relieve the registrant of any of its responsibility in this regard.

- M. Is subject to all other applicable portions of this Part and any limitations of the registration.
- N. Is subject to the provisions of 49 CFR Subtitle B. Chapter I. Subchapter C. (2020) when transporting registered material outside the registered site or where transport is on public highways, or who delivers licensed material to a carrier for transport.
- O. Shall not introduce registered material into a consumer good or product except as specifically allowed by this Part.
- P. Shall, when operating as a solid waste disposal site and facility, incorporate each TENORM radionuclide present within the registered materials into monitoring and closure plans required by 6 CCR 1007-2 Part 1.
- Q. Use, to the extent practical, procedures and engineering controls to reduce and maintain doses to members of the public as low as is reasonably achievable (ALARA).

20.5.3 Training requirements. All persons subject to registration shall meet the following requirements.

- A. All employed individuals whose assigned activities during normal and abnormal situations may involve exposure to registered TENORM or radiation resulting from that material which can reasonably be expected to occur during the life of a registered facility shall be instructed in the following topics:
 - 1. The storage, transfer, or use of sources of radiation;
 - 2. General awareness in the health protection problems associated with exposure to radiation and/or radioactive material to the individual and the potential offspring, designed to enable the employee to recognize and identify exposure to radiation and/or radioactive material;
 - 3. Requirements of this Part that are specifically applicable to the functions or activities the employee performs;
 - 4. The employee's responsibility to observe, to the extent within the worker's control, the applicable provisions of the Radiation Control Act, 6 CCR 1007-1, this Part and specific measures the employer has implemented for the protection of personnel from exposures to radiation or radioactive material;
 - 5. The employee's responsibility to report promptly to the registrant any condition which may constitute, lead to, or cause a violation of this Part and registrations, or unnecessary exposure to radiation and/or radioactive material;
 - 6. Methods and procedures for avoiding incidents; and
 - 7. Emergency response information, including the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation and/or radioactive material, and the procedures for mitigating any spill or release.
- B. The extent of these instructions shall be commensurate with potential radiological health effects associated with assigned work and present in the work place.

- C. Training frequency:
 - 1. Initial training. A new employee, or an employee who changes job functions involving exposure to radiation or radioactive material may perform those functions prior to the completion of training provided:
 - a. The employee performs those functions under the direct supervision of a properly trained and knowledgeable employee; and
 - b. The training is completed within 90 days after employment or a change in job function.
 - 2. Refresher training. An employee must receive the training required by this Part at least once every three years.
- D. Trainings received from a previous employer or other source may be used to satisfy the requirements of this Part provided a current record of training is obtained from the employees' previous employer or other source and the training is pertinent and applicable to the employees current job function.
- E. Each registrant is responsible for compliance with the requirements of this Part regardless of whether the training required by this subpart has been completed.
- F. Each registrant must create and maintain employee training record in accordance with Section 20.10.4.

20.5.4 Spill and release requirements.

- A. Registrants shall, immediately upon discovery, control and contain all spills/releases of Non-Exempt TENORM.
- B. Registrants shall investigate and remediate impacts resulting from spills/releases as soon as practicable.
- C. Reporting.
 - 1. Oil and Gas exploration and production registrants that are subject to the spill and release reporting requirements of 2 CCR 404-1 shall provide copies of all reports required by 2 CCR 404-1 Rule 912 regarding a spill/release of registered TENORM. These shall be provided to the Department no later than 24 hours after they are submitted to the Oil and Gas Conservation Commission of the State of Colorado (COGCC).
 - a. The report required by 2 CCR 404-1 Rule 912 shall include information available to the registrant about the type, isotopes, concentration, and volume of TENORM involved, including whether it is controlled or uncontrolled at the time of submitting the initial report.
 - 2. All other registrants shall make an initial notification to the Department as soon as practicable upon discovery of a spill or release in which Non-Exempt TENORM containing 10 μ Ci or more of either Radium-226, Radium-228, Lead-210, or Polonium-210 is spilled or released, and shall provide an initial written report no more than seven days after such a discovery.

- a. The initial written report of a spill/release shall include, at a minimum, the location of spill/release, the type and volume of TENORM involved in the spill/release, the actions that have been taken to control or contain such spill/release, the disposal of spill/release impacted material, and the plan and schedule to prevent any future spill/release.
- D. Upon receipt of the initial notification or the initial written report, the Department may require a site investigation and remediation work plan for review and approval when a spill/release results in any of the following conditions:
1. Soil contamination in excess of 5 pCi/g above natural background for any individual TENORM radionuclide
 2. Groundwater or surface water impacts in excess of WQCC standards
 3. The potential for any individual to exceed an annual dose of 100 millirem (1 millisievert)
- E. Site investigation and remediation work plans shall, at minimum, address the following:
1. Sampling and analysis to determine the extent of contamination in soil, surface water, and groundwater
 2. Remedial activities including either a radiological dose estimate demonstrating that no individual will exceed an annual dose of 100 millirem (1 millisievert) or information on the individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State.
 3. Access control to the impacted area
 4. Schedule for remedial activities to be conducted and complete
 5. Waste management

Registrant Types and Restrictions

20.6 Registration as a TENORM Generator.

20.6.1 Oil and Gas Registrants.

Non-Exempt TENORM generated by Oil and Gas exploration and production, as well as midstream and downstream activities, including those materials generated at a centralized E&P waste management facility shall be registered and are subject to the requirements and limitations as follows:

- A. All activities involving Non-Exempt TENORM generated by Oil and Gas exploration and production activities shall meet the applicable requirements of 2 CCR 404-1 in addition to the requirements of this part.
- B. Produced Fluids.

1. Registrants may possess produced fluids that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 250 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
2. Disposal. Registered produced fluids may only be disposed of as follows:
 - a. Injection into a Class II UIC Well, permitted pursuant to the 2 CCR 404-1, 800 Series Rules or a Class I Well permitted by EPA and registered with the Department in accordance with this Part;
 - b. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
 - c. Discharging into state waters, in accordance with the Water Quality Control Act, the rules and regulations promulgated thereunder and 2 CCR 404-1, Rule 905.
 - d. Evaporation in a properly lined pit at a centralized E&P waste management facility permitted in accordance with 2 CCR 404-1, Rule 907 and registered with the Department in accordance with this Part.
 - e. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.
3. Registrants in possession of produced fluids that contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of any TENORM Radionuclide and contain greater than 10% solids (or are less than 90% moisture content):
 - a. Shall confine these produced fluids to closed tanks, pipes, transfer lines or any other containment that prevents physical access to the materials.
 - b. Shall prohibit any physical access to or handling of these produced fluids outside of containment by unauthorized persons. These activities shall only be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.
 - c. Shall not reuse these produced fluids for enhanced recovery, drilling, or any other use.
 - d. Shall only transfer these materials for disposal.
4. Reuse and Recycling.

- a. Produced water may be reused for enhanced recovery, drilling, completion, and other approved uses in a manner consistent with existing water rights and in consideration of water quality standards and classifications established by the Water Quality Control Commission (WQCC) for waters of the state, or any point of compliance established by the Director pursuant to 2 CCR 404-1, Rule 914.

C. Oily Waste.

Registrants may possess oily waste that contain or are contaminated at concentrations, excluding natural background, not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.

1. Disposal. Oily wastes may only be disposed of as follows:

- a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- b. Land treatment or land application at a centralized E&P waste management facility permitted in accordance with 2 CCR 404-1, Rule 907 and registered with the Department in accordance with this Part.
- c. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

D. Pigging Waste.

Registrants may possess pigging waste from natural gas pipelines that contain or are contaminated at concentrations, excluding natural background, not in excess of 500 pCi/g each in dry weight of Lead-210, and Polonium-210.

1. Wastes from natural gas pipelines shall be:

- a. Characterized at minimum for their Lead-210 content.
- b. Maintained moist to prevent creation or dispersion of particulate materials
- c. Subject to Section 20.6.1.H. of this Part if they are determined to be a Hazardous Waste.

2. Limitations:

- a. Pigging Operations: If pigging wastes contain or are contaminated at concentrations, excluding natural background, in excess of 50 pCi/g in dry weight of either Lead-210, or Polonium-210, all pigging operations involving those wastes outside of the pipeline shall be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities;

3. Disposal.

Pigging wastes may only be disposed of as follows, except for Hazardous Wastes which shall meet Section 20.6.1.H:

- a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- b. Injection into a Class II UIC well permitted pursuant to the 2 CCR 404-1, 800 Series Rules and registered with the Department in accordance with this Part.
- c. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

E. Filter Socks.

Registrants may possess filter socks that contain or are contaminated at concentrations, excluding natural background, not in excess of 500 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.

1. Disposal.

Filter socks may only be disposed of as follows:

- a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- b. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

2. Handling

Registrants shall limit direct handling of filter socks to removal from filter housing, placement on gravity separation equipment, and placement in waste containers. All other direct handling, manipulation, or any other activities that would provide an exposure pathway different from that found in routine handling operations shall be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.

3. Registrants in possession of materials that contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of any TENORM Radionuclide shall additionally:
 - a. Maintain such materials in containment such that no individual may directly handle (with the exception of removal from filter housing, placement on gravity separation equipment, or placement in waste containers), physically interact with, or become contaminated with those materials and to prevent dispersion outside of the containment during operations or storage;
 - b. Conduct indoor air radon monitoring if materials contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of Radium-226 and are located in an occupied indoor workspace.
 - (1) Monitoring shall be performed during periods of normal operation and repeated if there is a significant increase in the quantity or concentration of registered materials contained within the workspace.
 - (2) Documentation of monitoring shall be maintained by the registrant and shall demonstrate that average indoor radon levels are not in excess of the U.S. Environmental Protection Agency's 4 pCi/L radon action level.
 - (3) If monitoring results indicate levels in excess of the 4 pCi/L action level, the work area shall be restricted from regular occupancy until mitigation action is taken and monitoring demonstrates that average indoor radon levels are below 4 pCi/L.
 - c. Conduct radiation dose rate surveys.
 - (1) Radiation dose rates shall not exceed 2 millirem/hour (0.02 millisievert/hour) at 30 centimeters from the source of radiation or from any surface that the radiation penetrates in any space that can be accessed or occupied by facility personnel
 - (2) Registered material shall be stored only in an area controlled by the registrant and shall not cause radiation dose rates at or beyond the boundary of that controlled area greater than 11 microrem/hour excluding natural background.

- (3) Registered material that exhibits a measured radiation dose rate which exceeds 50 microrem/hour at 30 centimeters excluding natural background shall be:
 - (a) Cordoned off with a physical barrier at a distance that ensures that radiation dose rates at or beyond the boundary of that barrier shall not exceed 50 microrem/hour excluding natural background.
 - (b) Posted at the barrier with a conspicuous sign or signs bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL".
 - (c) Managed such that no individual handles these materials or accesses the cordoned off area for a period of time in excess of 50 hours in a year.
 - (d) The registrant shall keep a record of all individuals accessing or handling these materials which shall contain at a minimum; the name of the individual; the date; the length of time in hours; and a year to date total number of hours for the individual.
 - (e) This record shall be maintained by the registrant for inspection by the Department.
- F. Pipes, Pipescale, and other Processing Equipment.
1. Scale.

Registrants may possess waste pipe with scale deposition which contains or is contaminated with Radium-226, Radium-228, Lead-210, and Polonium-210 and meet the following criteria:

- a. Pipes shall be characterized by measuring the highest radiation dose rate on contact with and at 30 centimeters from both the exterior surface and each accessible surface of the interior of the pipe with a portable radiation detector.
- b. Individual or collections of pipe sections shall not exhibit a measured radiation dose rate which exceeds 2 millirem/hour (0.02 millisievert/hour) at 30 centimeters from the source of radiation or from any surface that the radiation penetrates.
- c. Individual or collections of pipe sections shall be stored only in an area controlled by the registrant and shall not cause radiation dose rates at or beyond the boundary of that controlled area greater than 11 microrem/hour excluding natural background.
- d. Individual or collections of pipe sections that exhibit a measured radiation dose rate which exceeds 50 microrem/hour at 30 centimeters excluding natural background shall be:

- (1) Cordoned off with a physical barrier at a distance that ensures that radiation dose rates at or beyond the boundary of that barrier shall not exceed 50 microrem/hour excluding natural background.
- (2) Posted at the barrier with a conspicuous sign or signs bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL".
- (3) Managed such that no individual handles these materials or accesses the cordoned off area for a period of time in excess of 50 hours in a year.
 - (a) The registrant shall keep a record of all individuals accessing or handling these materials which shall contain at a minimum; the name of the individual; the date; the length of time in hours; and a year to date total number of hours for the individual.
 - (b) This record shall be maintained by the registrant for inspection by the Department.

e. Disposal.

These waste pipes may only be disposed of as follows:

- (1) Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- (2) Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

f. Reuse and Recycling.

These waste pipes may only be recycled and reused by persons who are authorized for such activities under a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State.

- g. Any removal of scales by physical or chemical methods for disposal shall be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.

2. Radon Progeny Deposits.

Registrants may possess waste pipe and other processing equipment from natural gas operations with radon progeny deposits which contain or is contaminated with Lead-210, and Polonium-210 and meet the following criteria:

- a. Pipes and other processing equipment shall be characterized by:
 - (1) Measuring the highest radiation dose rates on contact with and at 30 centimeters from both the exterior surface and each accessible surface of the interior with a portable radiation detector; and
 - (2) Measuring the level of non-fixed alpha contamination of each accessible interior surface in disintegrations per minute per 100 square centimeters.
- b. Individual or collections of pipes or other processing equipment shall not exhibit a measured radiation dose rate which exceeds 2 millirem/hour (0.02 millisievert/hour) at 30 centimeters from the source of radiation or from any surface that the radiation penetrates.
- c. Individual or collections of pipe sections shall be stored only in an area controlled by the registrant and shall not cause radiation dose rates at or beyond the boundary of that controlled area greater than 11 microrem/hour excluding natural background.
- d. Individual or collections of pipe sections that exhibit a measured radiation dose rate which exceeds 50 microrem/hour at 30 centimeters excluding natural background shall be:
 - (1) Cordoned off with a physical barrier at a distance that ensures that radiation dose rates at or beyond the boundary of that barrier shall not exceed 50 microrem/hour excluding natural background.
 - (2) Posted at the barrier with a conspicuous sign or signs bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL".
 - (3) Managed such that no individual handles these materials or accesses the cordoned off area for a period of time in excess of 50 hours in a year.
 - (a) The registrant shall keep a record of all individuals accessing or handling these materials which shall contain at a minimum; the name of the individual; the date; the length of time in hours; and a year to date total number of hours for the individual.
 - (b) This record shall be maintained by the registrant for inspection by the Department.
- e. Disposal.

These materials may only be disposed of as follows:

- (1) Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- (2) Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

f. Reuse and Recycling.

These waste pipes may only be recycled and reused by persons who are authorized for such activities under a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State.

- g. All operations that would likely disturb the radon progeny deposits and make particulates available for ingestion or inhalation including, but not limited to, grinding, cutting, or other abrasive processes involving items in which the level of non-fixed alpha contamination exceeds 600 disintegrations per minute per 100 square centimeters shall only be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.
- h. Any removal of scale by physical or chemical methods for disposal other than those pigging operations addressed in Section 20.6.1.D shall be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.

G. Other waste.

Registrants may possess other E&P waste as well as other solid wastes generated by oil and gas exploration and production, midstream, or downstream related activities including, but not limited to, tank bottoms, filter solids or cake, condensate sludges, molecular sieve residuals, amine filters, water treatment residuals, and other processing and storage wastes that contain or are contaminated at concentrations, excluding natural background, not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.

1. Subject to Section 20.6.1.H of this Part if they are determined to be a Hazardous Waste.
2. Disposal.

These wastes may only be disposed of as follows, except for Hazardous Wastes which shall meet Section 20.6.1.H:

- a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
- b. Injection into a Class II UIC well permitted pursuant to the 2 CCR 404-1, 800 Series Rules and registered with the Department in accordance with this Part.
- c. Treatment at a Centralized E&P Waste Management Facility permitted pursuant to 2 CCR 404-1, Rule 907 and registered with the Department in accordance with this Part.
- d. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

H. RCRA Hazardous Waste.

Any hazardous waste as defined in 6 CCR 1007-3 Part 261 generated by oil and gas exploration and production, midstream, or downstream related activities which contain Non-Exempt TENORM shall be registered and are subject to the requirements and limitations as follows:

1. Registrants may possess materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 100 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
2. Registrants in possession of materials that contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of any TENORM Radionuclide and contain greater than 10% solids (or are less than 90% moisture content) shall additionally:
 - a. Maintain such materials in containment such that no individual may physically interact with, directly handle, or become contaminated with those materials and to prevent dispersion outside of the containment during operations or storage;
 - b. Require that all direct handling, manipulation, and any other activities that would provide an exposure pathway different from that found in routine hazardous waste handling operations be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities;

- c. Conduct indoor air radon monitoring if materials contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of Radium-226 and are located in an occupied indoor workspace.
 - (1) Monitoring shall be performed during periods of normal operation and repeated if there is a significant increase in the quantity or concentration of registered materials contained within the workspace.
 - (2) Documentation of monitoring shall be maintained by the registrant and shall demonstrate that average indoor radon levels are not in excess of the U.S. Environmental Protection Agency's 4 pCi/L radon action level.
 - (3) If monitoring results indicate levels in excess of the 4 pCi/L action level, the work area shall be restricted from regular occupancy until mitigation action is taken and monitoring demonstrates that average indoor radon levels are below 4 pCi/L.

- d. Conduct radiation dose rate surveys.
 - (1) Radiation dose rates shall not exceed 2 millirem/hour (0.02 millisievert/hour) at 30 centimeters from the source of radiation or from any surface that the radiation penetrates in any space that can be accessed or occupied by facility personnel
 - (2) Registered material shall be stored only in an area controlled by the registrant and shall not cause radiation dose rates at or beyond the boundary of that controlled area greater than 11 microrem/hour excluding natural background.
 - (3) Registered material that exhibits a measured radiation dose rate which exceeds 50 microrem/hour at 30 centimeters excluding natural background shall be:
 - (a) Cordoned off with a physical barrier at a distance that ensures that radiation dose rates at or beyond the boundary of that barrier shall not exceed 50 microrem/hour excluding natural background.
 - (b) Posted at the barrier with a conspicuous sign or signs bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL".
 - (c) Managed such that no individual handles these materials or accesses the cordoned off area for a period of time in excess of 50 hours in a year.

- (d) The registrant shall keep a record of all individuals accessing or handling these materials which shall contain at a minimum; the name of the individual; the date; the length of time in hours; and a year to date total number of hours for the individual.
 - (e) This record shall be maintained by the registrant for inspection by the Department.
- 3. Registrants shall only transfer materials for disposal, treatment, or storage to a RCRA Subtitle C hazardous waste permitted treatment, storage and disposal facility or interim status facility which is:
 - a. Within Colorado, a facility authorized to receive such material under terms of a registration as per this part or a specific radioactive materials license issued by the Department; or
 - b. Outside of Colorado, a facility authorized to receive such material under terms of a specific radioactive materials license or equivalent licensing document, issued by the NRC or any Agreement State, or to any person otherwise authorized to receive or not prohibited from receiving such material by the Federal Government or any agency thereof, the Department, or an Agreement State;
- 4. Registrants shall, prior to transfer of any materials, provide a written statement to the receiving facility as part of the description of the hazardous waste which clearly indicates the presence of naturally occurring radioactive materials as a constituent and provides characterization data regarding the radiological content of the materials to include the concentrations, in dry weight and excluding natural background, of Radium-226, Radium-228, Lead-210, and Polonium-210 as applicable.

20.6.2 Water Treatment Registrants.

A. Drinking Water.

Non-Exempt TENORM generated by drinking water treatment activities shall be registered and are subject to the requirements and limitations as follows:

- 1. Registrants may possess materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 500 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- 2. TENORM shall be disposed as follows:
 - a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
 - b. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State;

- c. Discharge into sanitary sewerage for treatment at a domestic wastewater treatment facility registered with the Department in accordance with this Part;
 - (1) Prior to any discharge written acknowledgement and approval shall be obtained from the wastewater treatment facility;
 - (2) This record shall be maintained by the registrant for inspection by the Department;
 - d. Discharge into state waters, in accordance with the Water Quality Control Act;
3. Beneficial Use.
- Registered drinking water treatment residuals may be beneficially used or transferred to an individual registered with the Department for beneficial use in accordance with this Part.
4. Registrants in possession of materials that contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of any TENORM Radionuclide and contain greater than 10% solids (or are less than 90% moisture content) shall additionally:
- a. Maintain such materials in containment such that no individual may physically interact with, directly handle, or become contaminated with those materials and to prevent dispersion outside of the containment during operations or storage;
 - b. Require that all direct handling, manipulation, and any other activities that would provide an exposure pathway different from that found in routine water treatment operations be performed by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities;
 - c. Conduct indoor air radon monitoring if materials contain or are contaminated at concentrations, excluding natural background, in dry weight in excess of 50 pCi/g of Radium-226 and are located in an occupied indoor workspace.
 - (1) Monitoring shall be performed during periods of normal operation and repeated if there is a significant increase in the quantity or concentration of registered materials contained within the workspace.
 - (2) Documentation of monitoring shall be maintained by the registrant and shall demonstrate that average indoor radon levels are not in excess of the U.S. Environmental Protection Agency's 4 pCi/L radon action level.

- (a) If monitoring results indicate levels in excess of the 4 pCi/L action level, the work area shall be restricted from regular occupancy until mitigation action is taken and monitoring demonstrates that average indoor radon levels are below 4 pCi/L.
 - d. Conduct radiation dose rate surveys.
 - (1) Radiation dose rates shall not exceed 2 millirem/hour (0.02 millisievert/hour) at 30 centimeters from the source of radiation or from any surface that the radiation penetrates in any space that can be accessed or occupied by facility personnel
 - (2) Registered material shall be stored only in an area controlled by the registrant and shall not cause radiation dose rates at or beyond the boundary of that controlled area greater than 11 microrem/hour excluding natural background.
 - (3) Registered material that exhibits a measured radiation dose rate which exceeds 50 microrem/hour at 30 centimeters excluding natural background shall be:
 - (a) Cordoned off with a physical barrier at a distance that ensures that radiation dose rates at or beyond the boundary of that barrier shall not exceed 50 microrem/hour excluding natural background.
 - (b) Posted at the barrier with a conspicuous sign or signs bearing the radiation symbol prescribed in 6 CCR 1007-1 Part 4, Section 4.27 and the words "CAUTION, RADIOACTIVE MATERIAL".
 - (c) Managed such that no individual handles these materials or accesses the cordoned off area for a period of time in excess of 50 hours in a year.
 - (d) The registrant shall keep a record of all individuals accessing or handling these materials which shall contain at a minimum; the name of the individual; the date; the length of time in hours; and a year to date total number of hours for the individual.
 - (e) This record shall be maintained by the registrant for inspection by the Department.
- B. Domestic Wastewater Treatment.

Wastewater treatment facilities that accept, from a generator registered per Sections 20.6.2.A or 20.6.2.C of this Part, or generate Non-Exempt TENORM shall be registered and are subject to the requirements and limitations as follows:

1. Registrants may accept by way of their collection system or at their headworks TENORM materials discharged from a water treatment facility registered with the Department in accordance with this Part that:

- a. Contain less than 10% solids; and
 - b. Contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 500 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210; and
 - c. Constitute less than 10% of the total volume of non-TENORM materials received by the system in the period in which it is received.
2. TENORM materials which contain or are contaminated at concentrations, excluding natural background, in dry weight greater than 50 pCi/g shall be directly handled only by individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State. The registrant may seek to obtain a specific radioactive materials license to perform these activities or may use a specifically licensed service provider authorized for these activities.
 3. Registrants may also possess materials in the form of residuals generated during primary, secondary or advanced wastewater treatment processes, any materials in process that are precursors to an accumulated treated residual product, biosolids, or any other materials that are part of the wastewater treatment process that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
 4. TENORM shall be disposed as follows:
 - a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
 - b. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State;
 - c. Discharge into state waters, in accordance with the Water Quality Control Act;
 5. Biosolids containing TENORM may be beneficially used or transferred to an individual registered with the Department for beneficial use in accordance with this Part.
- C. Other water treatment.

Non-Exempt TENORM generated by any other water treatment activity shall be registered and are subject to the requirements and limitations as follows:

1. Registrants may possess materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.

2. TENORM shall be disposed as follows:
 - a. Disposal at commercial solid waste disposal facility registered with the Department in accordance with this Part;
 - b. Disposal at a facility authorized to receive such material under terms of a specific radioactive materials license, a Part 20 TENORM registration, or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State;
 - c. Discharge into sanitary sewerage for treatment at a domestic wastewater treatment facility registered with the Department in accordance with this Part;
 - (1) Prior to any discharge written acknowledgement and approval shall be obtained from the wastewater treatment facility;
 - (2) This record shall be maintained by the registrant for inspection by the Department;
 - d. Discharge into state waters, in accordance with the Water Quality Control Act;

20.7 Registration as a user of TENORM for Beneficial Purposes.

20.7.1 Use and Distribution of Biosolids.

Non-Exempt TENORM in the form of biosolids for use and distribution shall be registered and are subject to the requirements and limitations as follows:

- A. Registrants may possess materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- B. Activities shall be in accord with a Notice of Authorization for the Use and Distribution of Biosolids issued by the Water Quality and Control Division of the Department and 5 CCR 1002-64.
- C. Application to land for beneficial use.
 1. Concentrations of radionuclides in biosolids or final product material applied to land shall not exceed 25 pCi/g each of Radium-226, Radium-228, Lead-210, and Polonium-210.
 2. Biosolids or final product material containing Non-Exempt TENORM shall not be applied to an authorized application site for more than 20 years or 20 cropping cycles without written Department approval.
- D. Characterization.

Characterization of TENORM materials including sampling and analysis shall be performed using appropriate and standard methods such as EPA SW-846 or equivalent alternative methods recognized by the Department.

1. Biosolids or final product material shall be characterized for concentrations of TENORM radionuclides after final treatment.
 2. Characterization shall be done initially after final treatment and thereafter at the following frequencies based on dry short tons per year (dst/y) produced consistent with 5 CCR 1002-64 Section 64.16 a.(1):
 - a. Once per year for less than 319 dst/y.
 - b. Once per quarter for greater than 319 but less than 1,650 dst/y.
 - c. Once per two months for greater than 1,650 but less than 16,500 dst/y.
 - d. Once per month for greater than 16,500 dst/y.
 3. Records of characterization shall be maintained for inspection by the Department until such time as the authorized application site is closed or deactivated in accordance with 5 CCR 1002-64 Sections 64.10 H. and I.
 4. Registrants shall provide notice to the Department sixty days prior to requesting closure, deactivation, or a transfer of an authorized application site in accordance with 5 CCR 1002-64 Sections 64.10 H., I. and J.
- E. Records of land application shall be provided to the Department annually. Records shall include:
1. Each application site location; and
 2. Number of applications at each site.
- F. Distribution.

Biosolids or final product material containing Non-Exempt TENORM shall be distributed only to a recipient registered with the Department in accord with this part or to an individual authorized to receive such material under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

20.7.2 Land application of water treatment residuals.

Non-Exempt TENORM in the form of water treatment residuals to be used for land application shall be registered and are subject to the requirements and limitations as follows:

- A. Registrants may possess materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- B. Activities shall be in accord with a Beneficial Use Certification or Beneficial Use Determination issued by the Hazardous Materials and Waste Management Division of the Department.
- C. Application to land for beneficial use.

1. Concentrations of radionuclides in water treatment residuals applied to land shall not exceed 25 pCi/g each of Radium-226, Radium-228, Lead-210, and Polonium-210.
2. Water treatment residuals containing Non-Exempt TENORM shall not be applied to an authorized application site for more than 20 years or 20 cropping cycles without written Department approval.

D. Characterization.

Characterization of TENORM materials including sampling and analysis shall be performed using appropriate and standard methods such as EPA SW-846 or equivalent alternative methods recognized by the Department.

1. Water treatment residuals shall be characterized for concentrations of TENORM radionuclides prior to application.
2. Characterization shall be done initially on residuals to be applied to land and thereafter at the following frequencies based on dry short tons per year (dst/y) produced:
 - a. Once per year for less than 319 dst/y.
 - b. Once per quarter for greater than 319 but less than 1,650 dst/y.
 - c. Once per two months for greater than 1,650 but less than 16,500 dst/y.
 - d. Once per month for greater than 16,500 dst/y.
3. Records of characterization shall be maintained for inspection by the Department until such time as the application activities cease at the site.
4. Registrants shall provide notice to the Department sixty days prior to ceasing application activities at the site.

E. Records of land application shall be provided to the Department annually. Records shall include:

1. Each application site location; and
2. Number of applications at each site.

20.7.3 Composting Facility Registrant.

Facilities that compost Non-Exempt TENORM shall be registered and are subject to the requirements and limitations as follows:

- A. Registrants may accept and/or process feedstock materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- B. Commercial composting facility activities shall be in accord with 6 CCR 1007-2 Part 1 Section 14.

1. Registrants shall initially include or revise their Engineering Design and Operations Plan to include TENORM constituents in:
 - a. The description of feedstocks;
 - b. The waste characterization plan;
 - c. The evaluation of potential impacts to existing surface water and groundwater quality;
 - d. The groundwater monitoring plan; and
 - e. The compost sampling and testing description.
- C. Composting activities performed as part of further processing of biosolids at a domestic wastewater treatment works as shall be in accord with 5 CCR 1002-64 and a Notice of Authorization for the Use and Distribution of Biosolids issued by the Water Quality and Control Division of the Department.
- D. Sale or Distribution.
 1. Finished compost shall be characterized for concentrations of TENORM radionuclides prior to sale or distribution.
 2. Characterization, including sampling and analysis, shall be performed using appropriate and standard methods such as EPA SW-846 or equivalent alternative methods recognized by the Department.
 3. Characterization shall be done initially on finished compost and thereafter at the following frequencies based on dry short tons per year (dst/y) produced:
 - a. Once per year for less than 319 dst/y.
 - b. Once per quarter for greater than 319 but less than 1,650 dst/y.
 - c. Once per two months for greater than 1,650 but less than 16,500 dst/y.
 - d. Once per month for greater than 16,500 dst/y.
 - e. If feedstocks change the initial characterization shall be repeated.
 4. Registrants must ensure that concentrations of TENORM radionuclides in finished compost to be sold or distributed for off-site use shall not exceed 5 pCi/g each of Radium-226, Radium-228, Lead-210, and Polonium-210.
 5. Records of characterization data demonstrating compliance with the 5 pCi/g standard shall be maintained for inspection by the Department for no less than 5 years after the materials have been distributed.
 6. Compost that meets the 5 pCi/g standard is acceptable for unrestricted use and is no longer subject to this Part.
- E. Finished Compost containing Non-Exempt TENORM shall be:

1. Transferred only to a recipient registered with the Department in accord with this Part for use or disposal;
2. Reintroduced into the compost process; or
3. Transferred to an individual authorized to receive such material under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Department, or an Agreement State.

F. Final closure.

The compost facility shall not be closed and released for unrestricted use until:

1. All registered TENORM materials are disposed or transferred in accordance with Sections 20.7.3.E.1 or 20.7.3.E.3; and
2. Radiological characterization of the facility shall be conducted to ensure that:
 - a. Any radionuclide concentration in soil, adjacent to or within the facility boundary, does not exceed the limitation specified in Table 20-1 of this Part. If any exceedance is found, the facility shall be remediated until the limits in Table 20-1 are met.
 - b. Radionuclide concentrations in groundwater do not exceed 5 pCi/L for Radium-226 plus Radium-228 and 5 pCi/L for Lead-210 plus Polonium-210; or the statewide standards for radioactive materials established by the Water Quality Control Commission in accordance with the Water Quality Control Act, whichever is more restrictive. If any exceedance is found, the facility shall conduct groundwater remediation until the above limits are met.

20.7.4 Other Beneficial Uses.

Persons requesting the beneficial use of solid waste that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g in dry weight of Radium-226, Radium-228, Lead-210, or Polonium-210 shall:

- A. File a proposal with the Hazardous Materials and Waste Management Division of the Department in accord with 6 CCR 1007-2 Part 1 Section 8.6.
- B. Provide to the Department a comprehensive dose assessment demonstrating that the beneficial use activity would not result in a total effective dose equivalent to any individual member of the public in excess of 100 millirem/year (1 millisievert/year) and that the doses to members of the public as a result of the proposed activities are as low as is reasonably achievable (ALARA).
- C. Commence activities only after:
 1. A Beneficial Use Certification or Beneficial Use Determination is issued by the Hazardous Materials and Waste Management Division of the Department; and

2. The Radiation Control Program grants written authorization to engage in the activities as approved within the Beneficial Use Certification or Beneficial Use Determination.
- D. Limit beneficial use activities to those specifically approved and authorized within and by the A Beneficial Use Certification or Beneficial Use Determination and written authorization by the Radiation Control Program.

20.8 Registration as a TENORM Disposal Facility.

20.8.1 Sanitary landfill or municipal solid waste landfill (MSWLF) disposal.

Landfills that accept Non-Exempt TENORM for disposal shall be registered and are subject to the requirements and limitations as follows:

- A. Registrants may accept materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- B. Registrants shall meet all associated and applicable requirements of 6 CCR 1007-2 Part 1 for solid waste disposal.
- C. Registered facilities shall have an engineered liner or barrier layer with a hydraulic conductivity less than or equal to 1×10^{-7} cm/sec in accord with 6 CCR 1007-2 Part 1 Section 3.2.5 (3)
- D. Registered facilities shall have a leachate collection and monitoring system which meets 6 CCR 1007-2 Part 1 Section 3.2.5 (d)
- E. Registered facilities shall have a groundwater monitoring system which meets the applicable requirements of 6 CCR 1007-2 Part 1 Section 2.1.15 and 2.2
- F. Registered facilities shall incorporate the following operational practices into their Engineering Design and Operations Plan:
 1. Each registered facility shall have a waste characterization and disposal plan which includes waste acceptance procedures for TENORM materials
 2. Each registered facility shall have a minimum of 4 meters of materials not subject to this part, in addition to the engineered liner or barrier layer, between the lowest placement of Non-Exempt TENORM and groundwater
 3. Each registered facility shall place 6 inches of cover materials not subject to this part on all TENORM at the end of each operating day
 4. Each registered facility shall have a minimum of 3 meters of materials not subject to this part above Non-Exempt TENORM prior to the closure of any area. This may include the final cover system
 5. Leachate must be sampled and characterized for each TENORM isotope received by the facility
 - a. If concentrations of TENORM isotopes are detected in the leachate in excess of the groundwater standards these isotopes must be included in the groundwater monitoring plan

- b. Leachate containing concentrations of TENORM isotopes less than 100 pCi/L may be applied to the working face of the landfill.
 - c. Registrants shall not perform any other method of recirculation or application of leachate containing concentrations of TENORM isotopes in excess of groundwater standards within the facility without prior written approval from the Department.
 - 6. Any drill cuttings from methane gas collection system installation shall be placed within the facility on the working face and treated as TENORM waste.
 - 7. If solidification activities are approved within the Engineering Design and Operations Plan for the facility Non-exempt TENORM materials received by the facility for solidification shall be placed within the solidification basins and the solidification process should commence within 24 hours of receipt.
 - G. Following closure of the landfill, an environmental covenant must be placed on the facility property and shall include a specific provision which requires that any future buildings, residential or commercial, constructed on the permitted site post closure, require radon resistant construction, post construction assessment and testing, and radon mitigation in order to meet any federal, local, or Colorado standards or guidance on indoor radon concentrations.
 - 1. Alternatively, if the environmental covenant is more restrictive, i.e. no buildings, residential or commercial, are permitted to be constructed on the site, than that may suffice.
- 20.8.2 Centralized E&P waste management facilities that accept Non-Exempt TENORM for disposal shall be registered and are subject to the requirements and limitations as follows:
- A. Registrants shall comply with all applicable sections of 2 CCR 404-1.
 - 1. Radium-226, Radium-228, Lead-210, and Polonium-210 shall, when operations involve Non-Exempt TENORM, be included as a Contaminant of Concern in all instances in which Table 915-1 Cleanup Concentrations are required to be sampled, analyzed, or adhered to for the purposes of determining the nature and extent of any impact from the materials, groundwater, surface water or soil monitoring, remediation, confirming compliance, or closure.
 - a. For soils, a concentration, excluding natural background, not in excess of 5 pCi/g of each applicable radionuclide in dry weight shall be used as the concentration level for the purposes of determining compliance with this section. Concentration level values for groundwater and surface water shall be equal to 5 pCi/L for Radium-226 plus Radium-228; 5 pCi/L for Lead-210 plus Polonium-210; or equal to statewide standards for radioactive materials established by the Water Quality Control Commission in accordance with the Water Quality Control Act, whichever is more restrictive.
 - B. Registrants shall notify the Department of any exceedance of these radionuclide concentration levels and submit a plan for the investigation and remediation of the areas.

- C. Registrants shall, as part of the initial permit application process or as a facility modification proposal as required by 2 CCR 404-1 Rule 907, incorporate and include TENORM as a waste stream into all appropriate or applicable portions of the application or proposal including but not limited to waste profile, facility design, operating plan, ground water monitoring plan, or preliminary closure plan. The application or proposal for permit modification shall also be submitted to the Department for approval prior to accepting any TENORM materials for treatment or disposal.
- D. Registrants shall provide to the Department a copy of the facility's annual report as required by 2 CCR 404-1 Rule 907. TENORM materials shall be included within the report's summary of operations.
- E. Registrants may accept produced fluids that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 250 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210 for injection into a Class II UIC well permitted pursuant to the 2 CCR 404-1, 800 Series Rules.
 - 1. Shall provide demonstration, at the time of initial registration, that those activities will not result in the presence in an underground source of drinking water, as defined in 2 CCR 404-1, of any TENORM radionuclide that may adversely affect the health of persons or cause a violation of any of the U.S. Environmental Protection Agency's National Primary Drinking Water Regulations, 40 C.F.R. Part 141.
- F. Registrants may accept, for the purposes of dewatering or hydrocarbon recovery, materials that contain or are contaminated at concentrations, excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and Polonium-210.
- G. Any Non-Exempt TENORM materials generated during treatment or disposal activities shall be subject to all applicable requirements of Section 20.6.1.
- H. Closure.

A detailed site investigation, remediation, and closure work plan shall be submitted to the Department for review and approval at least sixty (60) days prior to closure. The work plan shall address, but not be limited to:

- 1. Sampling and analysis to determine the extent of contamination in or compliance with standards for soil, surface water, and groundwater
- 2. Activities required to decommission and remove all equipment contaminated with TENORM materials
- 3. Disposal of residual TENORM
- 4. Facility access control
- 5. Potential exposures to TENORM during remedial activities including either a radiological dose estimate demonstrating that no individual will exceed an annual dose of 100 millirem (1 millisievert) or information on the individuals authorized to perform such operations under terms of a specific radioactive materials license or equivalent licensing document, issued by the Department, NRC or any Agreement State.

6. Schedule for remedial and closure activities to be conducted and completed
7. Post-closure monitoring

20.9 Registration of other TENORM and TENORM Related Activities.

20.9.1 Any Non-Exempt TENORM material generated, used beneficially, or accepted for disposal which is not captured by Sections 20.6, 20.7, or 20.8 of this part may be registered with the Department when the Department makes a determination, upon request or application for such determination, that the reasonably maximally exposed individual will not receive a dose with a total effective dose equivalent (TEDE) of more than 100 millirem (1 millisievert) in one year from all licensed or registered sources of radiation including TENORM. This registration would be in lieu of a specific radioactive materials license as per Section 20.13

A. The registrant will be subject to the general registration provisions of this part and to any additional requirements and conditions with respect to the registrant's receipt, possession, use, disposal, and transfer of TENORM subject to this part, as it deems appropriate or necessary in order to:

1. Minimize danger to public health and safety, workers, or property; and
2. Prevent loss or theft of material subject to this part.

20.9.2 The Department may grant an approval to persons registered per Sections 20.6, 20.7, or 20.8 to conduct activities not specifically identified within Sections 20.6, 20.7, or 20.8, such as alternative disposal or handling practices, when the Department makes a determination, upon request or application for such determination, that as a result of the activities the reasonably maximally exposed individual will not receive a dose with a total effective dose equivalent (TEDE) of more than 100 millirem (1 millisievert) in one year from all licensed or registered sources of radiation including TENORM.

A. Approval for these alternate activities shall be approved in writing and records of the approval must be maintained until the registration is terminated pursuant to Section 20.12 of this Part.

20.10 Records.

20.10.1 Each registrant shall retain all records that are required by the regulations in this Part or by registration condition for the period specified by the appropriate regulation or registration condition. If a retention period is not otherwise specified by regulation or registration condition, each record must be maintained until the registration is terminated pursuant to Section 20.12 of this Part.

20.10.2 Each registrant shall make records available to the Department for inspection during normal business hours, and copies thereof shall be furnished to the Department upon request.

20.10.3 Each registrant shall retain records of receipt, transfer, and disposal of TENORM as long as the material is possessed and for three years following transfer or disposition, including at a minimum:

- A. The date of the transport;
- B. The identity of the TENORM generator or registrant;
- C. The identity of the TENORM transporter;

- D. The location of the TENORM pickup site;
- E. The type and volume of wastes, including radiological characterization data; and
- F. The name and location of the recipient or disposal site.

20.10.4 Each registrant must create and retain a record of current training of each employee, inclusive of the preceding three years, in accordance with Section 20.5.3 for as long as that employee is employed by that registrant and for 90 days thereafter. A registrant must make an employee's record of current training available upon request by the Department. The record must include:

- A. The employee's name;
- B. The most recent training completion date of the employee's training;
- C. A description, copy, or the location of the training materials used to meet the requirements in this section; and
- D. Certification that the employee has been trained as required by this Part.

20.10.5 Each registrant shall retain the radiological characterization information or other information that demonstrates compliance with the applicable requirements of this Part, including but not limited to, the analytical data and laboratory reports, volumes of the materials, waste or material profiles, surveys, and indoor radon monitoring.

20.11 Transfers.

The Department may, upon application or upon its own initiative, approve transfers of Non-Exempt TENORM not specifically authorized within this part as it determines is authorized by law and will not result in undue hazard to public health and safety or property.

20.12 Registration Termination.

20.12.1 Each registrant shall provide a written notification to the Department when the registration is ready for termination. The notification shall include documentation demonstrating that Sections 20.12.2.A through E have been met.

20.12.2 Registrations will be terminated by written notice to the registrant when the Department determines the following:

- A. TENORM has been properly transferred, dispositioned, or disposed of in accord with this part;
- B. Reasonable effort has been made to eliminate residual radioactive contamination, if present;
- C. The registrant has demonstrated, by radiation survey results and/or other appropriate methods, that the registration termination will be in compliance with Section 20.5.2.1;
- D. Department approved institutional controls have been implemented to limit public doses, if required; and
- E. For disposal facilities, all closure requirements have been implemented.

20.13 Specific Licensing.

20.13.1 Unlicensed persons who generate, handle, process, transfer, receive, transport, dispose of, possess, distribute, or beneficially use TENORM not exempt from this Part as per Section 20.4 and not meeting the requirements of both TENORM concentration limitation or permitted activity specified in Sections 20.6, 20.7, and 20.8 shall, within 90 days of making a TENORM determination:

- A. Submit an application for a specific radioactive materials license to the Department in accordance with 6 CCR 1007-1 Part 03, Section 3.8 or
- B. Submit a written request to the Department for an exemption or exception from specific licensing requirements. The request shall contain:
 - 1. A comprehensive description of TENORM materials;
 - 2. A comprehensive description of all operations involving TENORM materials;
 - 3. A detailed dose assessment demonstrating that the reasonably maximally exposed individual will not receive a dose with a total effective dose equivalent (TEDE) of more than 100 millirem (1 millisievert) in one year from all licensed or registered sources of radiation including TENORM.

20.13.2 The Department may grant an exemption or exception to any person from specific licensing requirements but require registration of the TENORM materials when the Department makes a determination, upon request or application for such determination, that the reasonably maximally exposed individual will not receive a dose with a total effective dose equivalent (TEDE) of more than 100 millirem (1 millisievert) in one year from all licensed or registered sources of radiation including TENORM.

20.13.3 Persons authorized by a specific radioactive materials license for TENORM materials are not subject to registration requirements in Sections 20.5 through 20.12.

20.13.4 The Department may, by written notice, require any person subject to registration to apply for and obtain a specific license if the Department determines that specific licensure is necessary to minimize danger to public health and safety or property. The notice shall state the reason or reasons for requiring a specific license.

20.13.5 A specific license is required to decontaminate equipment, facilities, or land not exempted under the provisions of Section 20.3. For purposes of this subsection, the term "decontaminate" shall not include routine maintenance which may result in the incidental removal of contamination.

20.13.6 A specific license is required to provide services to TENORM registrants for direct handling, manipulation, or any other activities that would provide an exposure pathway different from that found in routine handling operations authorized in Sections 20.6, 20.7, and 20.8.

Editor's Notes

6 CCR 1007-1 has been divided into separate parts for ease of use. Versions prior to 04/01/2007 are located in the first section, 6 CCR 1007-1. Prior versions can be accessed from the All Versions list on the rule's current version page. To view versions effective on or after 04/01/2007, select the desired part of the rule, for example 6 CCR 1007-1 Part 01 or 6 CCR 1007-1 Part 10.

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