

BEFORE THE DEPARTMENT OF ENVIRONMENTAL QUALITY  
OF THE STATE OF MONTANA

In the matter of the adoption of a new ) NOTICE OF ADOPTION  
subchapter codifying New Rules I )  
through X for technologically enhanced ) (SOLID WASTE MANAGEMENT)  
naturally occurring radioactive material )  
(TENORM) waste )

TO: All Concerned Persons

1. On August 23, 2019, the Department of Environmental Quality published MAR Notice No. 17-406 pertaining to the public hearings on proposed adoption of the above-referenced rule at page 1239 of the 2019 Montana Administrative Register, Issue Number 16. On January 31, 2020, the department published a supplemental notice of proposed adoption at page 159 of the 2020 Montana Administrative Register, Issue Number 2.

2. The department has adopted the following rules as proposed: New Rules V (17.50.1807), VII (17.50.1811), VIII (17.50.1812), and IX (17.50.1813).

3. The department has adopted the following rules as proposed, but with the following changes from the original proposal (or supplemental notice as noted below), new matter underlined, deleted matter interlined:

NEW RULE I (17.50.1801) PURPOSE AND APPLICABILITY (1) through (6) remain as proposed.

(7) The department incorporates by reference "Requirements for the Characterization of TENORM Wastes," Montana DEQ – Solid Waste Program (Revised ~~August 2019~~ June 2020). Copies of that document are available for public inspection at the Department of Environmental Quality, 1520 E. 6th Ave., P.O. Box 200901, Helena, MT 59620-0901, or by contacting the department at (406) 444-5300.

NEW RULE II (17.50.1802) DEFINITIONS (1) through (7) remain as proposed.

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

(9) remains as proposed.

~~(10) "Hazardous waste" has the meaning specified in 75-10-403, MCA.~~

(11) through (24) remain as proposed but are renumbered to (10) through (23).

~~(25)(24) "Rem" or "roentgen equivalent man" is a unit of measure that quantifies the amount of energy deposited by ionizing radiation deposited in human tissue modified by the effects of the specific type of radiation~~ the dose unit representing the amount of energy absorbed in human tissue, the distribution of the

energy, and the sensitivity of the whole body or individual organs to radiation.

(26) through (30) remain as proposed but are renumbered (25) through (29).

~~(31)~~(30) "Spill" means the accidental or unintentional release of TENORM waste during transport or onsite at the TENORM waste management system in an area not designated for disposal.

(32) through (40) remain as proposed but are renumbered (31) through (39).

~~(41)~~ "Unit" has the meaning specified in ARM 17.50.502.

(42) and (43) remain as proposed but are renumbered (40) and (41).

NEW RULE III (17.50.1803) TENORM WASTE MANAGEMENT SYSTEM LIMITS AND RESTRICTIONS (1) through (3)(a)(iii) remain as proposed in the supplemental notice.

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

(iv) through (xii) remain as proposed in the supplemental notice but are renumbered (v) through (xiii).

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

(b) through (9) remain as proposed in the supplemental notice.

NEW RULE IV (17.50.1806) TENORM WASTE MANAGEMENT SYSTEM LICENSE AND APPLICATION REQUIREMENTS (1) through (2)(d)(iv) remain as proposed.

~~(v)~~(e) an operation and maintenance plan that complies with [NEW RULE VI];

~~(vi)~~(f) a ground water monitoring plan that complies with [NEW RULE VII];

and

~~(vii)~~(g) a closure plan and a post-closure care plan that complies with [NEW RULE VIII].

NEW RULE VI (17.50.1808) OPERATION AND MAINTENANCE

(1) through (1)(d) remain as proposed in the supplemental notice.

(i) comply with "Requirements for the Characterization of TENORM Wastes" Montana DEQ – Solid Waste Program (Revised ~~August 2019~~ June 2020); and

(ii) through (5) remain as proposed in the supplemental notice.

NEW RULE X (17.50.1816) TENORM SPILL REPORTING REQUIREMENTS (1) and (2) remain as proposed.

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

(4) through (6) remain as proposed.

4. The department has thoroughly considered the comments and testimony received. A summary of the comments received, and the department's responses are as follows:

COMMENT NO. 1: A commenter would like to see a direct reference in the introduction to the rules that speaks to Montana's constitutional right to a clean and healthful environment.

RESPONSE: These rules are promulgated under the authority vested in the department by the Montana Solid Waste Management Act, Title 75, chapter 10, part 2, MCA. Section 75-10-202, MCA, contains legislative intent, policy, and findings that speak to the constitutional provisions raised by the commenter. It would be duplicative and not reasonably necessary to effectuate the purpose of the statute to repeat that statutory language in rule. Nevertheless, the department is mindful of its charge to protect a clean and healthful environment as guaranteed to our citizens by our State Constitution.

COMMENT NO. 2: Commenters stated that the department should not allow radioactive waste in Missoula, Glendive, or anywhere in Montana.

RESPONSE: The department appreciates the comment. TENORM is not waste from nuclear energy, weaponry, or medical industries that are measured in units called Curie. TENORM, in this rulemaking, is measured in picocuries (pCi). One picocurie (pCi) is 1 trillionth of a Curie. NORM stands for "naturally occurring radioactive material." It is a substance that naturally contains one or more radioactive isotopes, also called radionuclides. NORM is present at low levels in soils and rocks. TENORM is NORM that has been concentrated as a result of human activities, such as through manufacturing, mineral extraction, or water processing. Radionuclides are also present in some foods and common household items, including bananas at 4 pCi/gm, Brazil nuts at 6 picocuries per gram (pCi/g), cat litter at 5 pCi/g, coffee at 27 pCi/g, granite countertops at 27 pCi/g, and ammonia phosphate fertilizer at 123 pCi/g.

Furthermore, TENORM is not federal Nuclear Regulatory Commission (NRC) licensed material. NRC-licensed material consists of source material, special nuclear material, or byproduct material and must be received, possessed, used, transferred, or disposed of only under a general or specific license issued by NRC.

In the absence of federal TENORM regulations, states have jurisdiction and the authority for promulgating TENORM regulations. Therefore, the department is proposing these rules to ensure that this waste stream is regulated appropriately to protect human health and the environment.

COMMENT NO 3: Over 400 commenters supported the amended proposed rules set forth in the supplemental notice. Commenters thanked the department for listening to the concerns of Montanans and taking action to address them.

RESPONSE: The department appreciates the comments.

COMMENT NO. 4: One commenter supports the supplemental notice, but said it is important that regulations do not violate Montana law, including 50-79-102, MCA: "It is the purpose of this chapter to provide a program ... (2) to promote an orderly regulatory pattern within the state, among the states, and between the federal government and the state and facilitate intergovernmental cooperation with respect to use and regulation of sources of ionizing radiation to the end that

duplication of regulation may be minimized;"

RESPONSE: The department appreciates the comment. Section 50-79-102, MCA, applies to the regulation of nuclear waste and, therefore, is not directly applicable to these rules. Nevertheless, the department intends to work with federal, state, and local governments to form partnerships in dealing with TENORM waste management issues to minimize the duplication of regulation and to provide consistency with other regulatory entities where appropriate.

In the supplemental notice, one of the reasons the department proposed to keep the upper concentration limit at 50 pCi/g was to be consistent with neighboring states. The department received approximately 730 public comments requesting that the department keep the concentration limit at 50 pCi/g and noting the different concentration limit in the August 2019 proposal and rules promulgated by North Dakota. Since publication of the 2019 notice, the department became aware of neighboring states initiating rulemaking limiting the upper concentration to 50 pCi/g. Having an acceptance limit consistent with neighboring states discourages Montana from being targeted for disposal of higher concentration waste from those states. Having an upper limit of 50 pCi/g also provides consistency in Montana for the acceptance of TENORM waste in the absence of federal requirements regarding the disposal of TENORM. Because the department is removing the flexibility of the 2019 notice for TENORM waste management systems to be able to accept an occasional higher load up to 200 pCi/g, the department remains concerned with the potential for illegal dumping of TENORM waste that exceeds the acceptance limits of these amended proposed rules. The department will work with stakeholders, neighboring states, the Environmental Quality Council, and interested legislators to coordinate efforts with neighboring states and to address issues, such as illegal dumping and how to ensure that higher concentration loads will be disposed of at proper facilities that are licensed to accept loads higher than 50 pCi/g.

COMMENT NO. 5: A commenter suggested that, under NEW RULE I(3) the owner or operator of an existing waste management system licensed to accept TENORM waste should be required to comply with these rules within 6 months instead of the 12 months proposed.

RESPONSE: The department appreciates the comment but has kept the 12-month compliance timeline as originally proposed. Due to the additional requirements that waste management systems will need to implement, the department believes that 12 months is an appropriate timeframe for compliance and department approval.

COMMENT NO. 6: Commenters support that existing facilities must comply with the proposed rules.

RESPONSE: The department appreciates the comment.

COMMENT NO. 7: A commenter suggested revising the definition of contaminated soil in NEW RULE II(3) so that it is not limited to contamination from "organic compounds such as petroleum hydrocarbons." The commenter suggested that this definition should focus on TENORM contamination above a certain threshold, such as 5 pCi/g.

RESPONSE: The department appreciates the comment but does not believe the change is warranted. Petroleum hydrocarbons are only used as an example in the definition. The term "contaminated soil" is only referenced in NEW RULE VIII for closure and post-closure care to ensure that contaminated or stained soil is properly excavated or removed. The department intends the meaning of the term to be consistent with how the term is used by other programs within the department and to match the definition in ARM 17.50.403.

COMMENT NO. 8: A commenter suggested revising NEW RULE II(10) to read "Hazardous Waste has the meaning specified in 75-10-403, MCA, and in ARM 17.53.301(1) and 17.53.501(1)."

RESPONSE: In reviewing this comment, the department determined that the term "hazardous waste" is not used in the proposed rules. Defining this term is therefore unnecessary, and the department has removed the definition from the final rules.

COMMENT NO. 9: A commenter suggested revising NEW RULE II(25) to read "Rem or roentgen equivalent man is a unit of measurement that quantifies the amount of energy deposited by ionizing radiation deposited in human tissue modified by the effects of the specific type of radiation."

RESPONSE: The department agrees that the proposed definition was hard to follow and has revised the definition for clarity.

COMMENT NO. 10: A commenter stated that the definition of "Rem" in NEW RULE II(25) is hard to follow, and suggested it be changed to read, "a unit of measure that correlates the amount of radiation absorbed by an object or person to the biological effect of the dose."

RESPONSE: The department agrees that the proposed definition was hard to follow and has revised the definition for clarity. See response NO. 9.

COMMENT NO. 11: A commenter stated that there may be a typographical error in (26) and it should read x-ray rather than x-radiation.

RESPONSE: The department appreciates the comment, but it was not a typographical error. X-radiation is an accepted term used in the field of health physics and other disciplines.

COMMENT NO. 12: A commenter suggested revising the definition of "Spill" in NEW RULE II(31) to read, "the accidental or unintentional release of TENORM waste during transport or onsite at the TENORM waste management system in an area not designated for disposal."

RESPONSE: The department agrees with this comment and has made the change to be consistent with the terminology used in the remainder of the rules.

COMMENT NO. 13: Several comments suggested that drill cuttings and mud should be included in the definition of TENORM under NEW RULE II(33).

RESPONSE: The department disagrees. The definition of TENORM includes materials with increased radionuclide concentrations above location-

specific background levels as a result of past or present human practices. Materials that are exposed to the accessible environment as a result of human activities, but that have not been concentrated, are not considered TENORM. For example, excavated soil that is removed for the construction of a basement, is not TENORM because the soil is just being moved and not concentrated. In a similar manner, materials brought up to the surface by drilling operations but not concentrated, including drill cuttings and mud, do not meet the definition of TENORM. Six years of data collected from department-licensed solid waste facilities have shown drill cuttings to be significantly below 5 pCi/g combined radium. In addition, the department has found from recent testing of mine tailings, soil samples from petroleum release sites, granulated activated carbon from chlorinated solvent soil vapor extraction treatment filters, soil samples from petroleum tank excavation sites, and water treatment plant sludge from an historic mining site, that the concentration of combined radium in these materials is well below the regulatory threshold of 5 pCi/g.

COMMENT NO. 14: A commenter asked how benzene, toluene, hydrocarbons, and other VOCs will be monitored if drill cuttings and mud are not included in the definition of TENORM.

RESPONSE: Although not TENORM, drill cuttings and mud entering a TENORM waste management system will have to meet the acceptance criteria for a Class II management system under ARM Title 17, chapter 50, subchapter 11. The sampling requirements will be based upon the type of waste stream accepted. Drill cuttings and mud from hydraulic fracking wells are typically contaminated with hydrocarbons and therefore would need to be tested for benzene, toluene, hydrocarbons, and other volatile organic compounds.

COMMENT NO. 15: A commenter asked if drill cuttings and mud can be disposed of in a TENORM waste management system and, if so, whether they are subject to the same daily cover requirements as TENORM waste.

RESPONSE: Drill cuttings and mud may be accepted at a TENORM waste management system. If accepted for disposal, the drill cuttings and mud will be required to be covered as per the approved operational requirements for the facility and cannot be used as cover.

COMMENT NO. 16: A commenter asked if other states define drill cuttings and mud as TENORM and, if so, whether other states require testing.

RESPONSE: The department has not identified any neighboring state that defines drill cuttings and mud as TENORM. Neighboring states sampling requirements vary. For Montana's sampling requirements, see response NO. 15.

COMMENT NO. 17: A commenter supported the proposed definition of TENORM in NEW RULE II(33).

RESPONSE: The department appreciates the comment.

COMMENT NO. 18: A commenter suggested revising the definition of "transport" in NEW RULE II(39) to mean the movement of TENORM wastes from

the point of generation to any intermediate points and finally to the point of ultimate storage, treatment, recycling, recovery, or disposal. The commenter suggested the department strike the reference to the definition in ARM 17.50.403 because that definition only refers to ultimate "storage or disposal" locations, omitting situations where the ultimate transportation point may be treatment, recycling, or recovery facilities.

RESPONSE: The department appreciates the comment. The department is leaving the definition as proposed to be consistent with the definition in ARM 17.50.403(58). The department may consider this issue in a future rulemaking.

COMMENT NO. 19: A commenter suggested removing the definition of "unit" in NEW RULE II(41) because it is confused with unit of measurement.

RESPONSE: The department agrees with this comment and has removed this definition from the final rules to avoid confusion.

COMMENT NO. 20: A commenter noted that in the 4th paragraph of the reason section on page 1246 discussing the 5 pCi/g regulatory threshold, the reference to "New Rule I(3)" should be corrected to read "New Rule I(2)".

RESPONSE: The department agrees that the reference should be to New Rule I(2), as that is the section that includes the 5 pCi/g combined radium threshold for regulation of TENORM.

COMMENT NO. 21: One commenter discussed how the term "filter media" generally refers to filtering agents that are contained within a filtering system such as sand, anthracite, greensand, etc., which are common in drinking water treatment systems. Filter socks are the actual filters, which do not contain any anthracite or other additive media that specifically attract radionuclides or contaminants. The fabric that forms the sock is the only means of filtration. The commenter suggested changing references to filter media to instead read "filters (or filter socks) and other filter media."

RESPONSE: The department intends the term "filter media" to include all filtering materials, including but not limited to devices such as filter socks. The department has modified the definition of "filter media" in the final rules to provide clarity.

COMMENT NO. 22: The department received many comments during the first public comment period requesting that the department change the gate screening level for TENORM waste in NEW RULE III(1)(a) of the original proposal notice from 200 to 100 microrentgen per hour ( $\mu\text{R/hr}$ ), excluding background. Many commenters stated that Montana's rules should match North Dakota's gate screening limit, as having a higher gate screening limit than that of neighboring states encourages generators and transporters to bring wastes generated in neighboring states into Montana for disposal. The department also heard from several commenters that, generally, 200  $\mu\text{R/hr}$  is more dangerous than 100  $\mu\text{R/hr}$ , and that the higher limit puts landfill workers and neighboring residents at risk. At least one commenter also stated that a gate screening limit of 200  $\mu\text{R/hr}$  is

inconsistent with an acceptance limit of 200 pCi/g.

RESPONSE: The department appreciates these comments. In the supplemental notice published January 31, 2020, the department amended the proposed gate screening limit, establishing a uniform limit of 100  $\mu\text{R/hr}$ , excluding background, for all incoming loads of TENORM waste. The department made this change in conjunction with changes to the proposed waste acceptance limit in NEW RULE III(1)(b). The department is adopting NEW RULE III(1)(a) as proposed in the supplemental notice, which the department believes addresses the concerns raised by these comments. Please see the reason statement for NEW RULE III in the supplemental notice.

COMMENT NO. 23: Over 400 commenters supported the amended proposed rule changing the gate screening level from 200 microrentgen per hour ( $\mu\text{R/hr}$ ) to 100  $\mu\text{R/hr}$ .

RESPONSE: The department appreciates the comments.

COMMENT NO. 24: One commenter recommended using 200 microrentgen per hour ( $\mu\text{R/hr}$ ) as the upper gate screening limit rather than 100  $\mu\text{R/hr}$ . The commenter agrees with and supports the rationale provided by the department on pages 1249-1250 of the 8/23/19 proposed rulemaking, stating it demonstrates that the 200  $\mu\text{R/hr}$  limit is a safe level that is protective of human health for both TENORM waste and TENORM surface-contaminated objects. The commenter stated that the analysis previously provided by the department on those pages shows that the estimated exposure to a facility worker (i.e., the maximally exposed individuals) from materials at 200  $\mu\text{R/hr}$  would be less than 20 percent of the annual public dose limit of 100 mrem/yr and less than 5 percent of the hourly public dose limit of 2.0 mrem/hr (i.e., the department's worker exposure estimates from the proposed maximum gate screening level of 200  $\mu\text{R/hr}$  were only 19.6 mrem/yr and 0.098 mrem/hr). The commenter argues that there is nothing in the supplemental notice that refutes those prior valid estimates or that justifies reducing the gate screening level to 100  $\mu\text{R/hr}$  for protection of the facility workers or the public.

RESPONSE: The department appreciates the comment but disagrees with the commenter's suggested upper gate screening limit. In the supplemental notice, the department determined that a uniform gate screening level of 100  $\mu\text{R/hr}$  was reasonably necessary both in conjunction with the changed waste acceptance limit in NEW RULE III(1)(b) and to eliminate the uncertainty of having separate gate screening limits based on the type of TENORM waste in each load.

The previously proposed screening level of 200  $\mu\text{R/hr}$  was based on a higher maximum concentration limit. The 100  $\mu\text{R/hr}$  screening level is consistent with a combined radium concentration in bulk materials of 50 pCi/g at full equilibrium with its decay products. The actual exposure rate from a shipment of bulk TENORM would vary widely depending on the "age" of the radium in the material. Radium-226 itself does not have a significant gamma signature. It is the short-lived decay products of Ra-226 (Pb-214 and Bi-214) that result in significant gamma exposure rates. In nature, the decay products are in equilibrium with the parent, Ra-226.

However, when Ra-226 is chemically separated as, for example, in a filtration process, the gamma exposure rate per pCi/g Ra-226 is much lower than it would be if the decay products are present. It takes about four days after chemical separation for the decay products to build in to 50 percent of equilibrium and approximately three weeks for the decay products to reach full equilibrium, i.e., equal activity concentration, with the parent Ra-226. If a load with freshly separated Ra-226 at 50 pCi/g is received at a disposal site, it would not trigger the screening level. However, if a load of material containing Ra-226 at the maximum equilibrium state were to be received, it would just barely meet the 100  $\mu$ R/hr screening level. The determination as to whether a load is acceptable, i.e., meets the 50 pCi/g limit, is based on the radiochemical analysis results stated in the waste profile, not the exposure rate screening level.

As noted above, the 200  $\mu$ R/hr gate screening level was based on a maximum combined radium concentration in a single load of 200 pCi/g. The gate screening level at 50 pCi/g would be significantly lower at a maximum of 100  $\mu$ R/hr. This screening level allows some leeway for Ra-226 that is in equilibrium with its short-lived decay products. The 100  $\mu$ R/hr gate screening level for loads of contaminated equipment is reasonable because there is not a practical way to assess the radium concentrations in equipment. The only way of ensuring that such loads would not present a risk to a person is to limit the exposure rate.

With regard to the gate screening level applying to an average exposure rate or the maximum exposure rate measured, there is significant leeway in the gate screening level of 100  $\mu$ R/hr that using the maximum exposure rate is appropriate. On average, a load of radium at 50 pCi/g would most likely have an external exposure rate of about 50  $\mu$ R/hr depending on the age of the Ra-226 (i.e., degree of equilibrium with the gamma emitting decay products). The external exposure rate on the exterior surfaces of the vehicle would vary depending on the material and potential shielding by materials with lower radium concentrations. Therefore, the gate screening level allows for such variability. As noted previously, the primary determinant of whether the load is acceptable for disposal at the TENORM facility is the waste profile, not the screening level. The screening level just provides some assurance that the load does not include materials with significantly higher radium concentrations.

COMMENT NO. 25: The department received many comments during the first public comment period requesting that the proposed waste acceptance limit of 200 pCi/g in NEW RULE III(1)(b) be lowered to 50 pCi/g and that the requirement to maintain a "running average" of 50 pCi/g in the TENORM waste unit be removed. Commenters expressed concern that the department would not be able to adequately monitor and enforce the 200 pCi/g upper acceptance limit or the "rolling average" of 50 pCi/g in the TENORM waste unit, noting in particular the lack of any standardized method for calculating the in-place average concentration of TENORM waste in a TENORM waste unit. Many commenters stated that Montana's rules should match North Dakota's acceptance limit. The commenters expressed concern that having a higher acceptance limit than neighboring states would encourage generators and transporters to bring wastes generated in nearby states into

Montana for disposal. Some commenters also expressed concern for worker exposure to waste with greater radioactivity if individual loads of up to 200 pCi/g were allowed to be disposed in a TENORM waste management system.

RESPONSE: The department appreciates these comments. In the supplemental notice published January 31, 2020, the department amended the proposed waste acceptance limit, establishing a static acceptance limit of 50 pCi/g of combined radium Ra-226 and Ra-228 for TENORM waste entering the system. In conjunction with the new acceptance limit, the department has removed the requirement to maintain a separate rolling concentration average with the TENORM waste unit. The department is adopting NEW RULE III(1)(b) as proposed in the supplemental notice, which the department believes addresses the concerns raised by these comments. Please see the reason statement for NEW RULE III in the supplemental notice.

COMMENT NO. 26: Over 400 commenters supported the amended proposal eliminating the rolling 50 pCi/g average in place concentration limit and 200 pCi/g upper concentration limit. The commenters supported replacing it with an upper static concentration limit of 50 pCi/g.

RESPONSE: The department appreciates the comments.

COMMENT NO. 27: A commenter disagrees with the amended proposed rule lowering the maximum allowable concentration from 200 pCi/g to 50 pCi/g. The commenter asserts that regulations are often full of complex issues to be considered and addressed, but the industry and the department are both well equipped to address the complexities of having 200 pCi/g as an upper concentration limit while maintaining a 50 pCi/g average in place. The commenter stated that the 200 pCi/g maximum is protective of the public and the landfill worker (i.e., the maximally exposed individual) and below the dose limits recommended for the public. The commenter argued that it is the overall average concentration within the waste unit that ultimately determines the annual dose to the public and to facility workers. Therefore, allowing a maximum concentration of 200 pCi/g to accommodate the anticipated periodic variability in waste streams, while procedurally maintaining the required  $\leq 50$  pCi/g average concentration, remains protective regardless of what the allowable upper limit is for periodic individual loads.

The commenter also stated that the second reason given in the supplemental notice for proposing to change the maximum allowable concentration from 200 pCi/g to 50 pCi/g appears to be based simply on a desire for consistency with what neighboring states may decide to adopt as their standards. The commenter recommended that the department remain committed to the science-based approach previously proposed rather than being influenced by unnecessarily conservative neighboring state policies that do not provide the necessary flexibility to accommodate the variability of TENORM wastes and to ensure availability of appropriate management and disposal options and discourage illegal dumping.

RESPONSE: The department appreciates the comment but has kept the waste acceptance limit as proposed in the supplemental notice. The majority of oil and gas TENORM waste will meet the 50 pCi/g limit, and thus will be acceptable for disposal at a TENORM facility under the Montana regulations. The decision to limit

the maximum Ra-226 concentration to 50 pCi/g is based on two primary considerations: (1) simplicity of compliance and enforcement, and (2) compatibility with surrounding states. However, there are additional radiation safety considerations associated with allowing Ra-226 concentrations up to 200 pCi/g. While the risk assessment was based on an average concentration of 50 pCi/g, it did not account for significant fluctuations in the concentrations to which a single worker might be exposed. Another concern is the consistency of Ra-226 concentrations within a load. A load with materials of variable Ra-226 concentrations, "hot spots," that might not be identified in the waste profile could expose workers to elevated radiation exposures. Requiring a maximum average Ra-226 concentration in each load would minimize that risk.

It is imperative that the regulations be easy to implement from the standpoint of both the TENORM landfill operator and state regulatory authorities. A variable concentration limit would require a relatively sophisticated tracking system and a method for ensuring that the limit on the average concentration is never exceeded. By contrast, a static upper acceptance limit of 50 pCi/g makes it easier for the department to verify and enforce these rules by reducing the number of variables associated with maintaining an average concentration within the TENORM waste unit. In addition, removing the variable acceptance limit streamlines facility recordkeeping and the determination as to whether an individual load of TENORM waste may be accepted. Generators and transporters of TENORM waste also have the added certainty that TENORM waste meeting the acceptance levels under (1)(a) and (1)(b) may be accepted at a facility.

States surrounding Montana have either enacted, proposed, or are in the process of proposing regulations limiting the maximum combined radium to 50 pCi/g. Having a wide variety in the state disposal limits for radium would create a confusing system that could encourage cross-state disposal requiring longer transit distance with the attendant non-radiological risks. Until the federal government proposes and implements TENORM regulations for waste disposal, it is advisable for the states to have consistent regulatory systems.

COMMENT NO. 28: Another commenter did not support the decision to lower the limits in the TENORM rules. The commenter expressed concern that the supplemental notice is based on politics and not science. The commenter believes the original proposal to allow up to 200 pCi/g was sound and justified. The commenter expressed concern that the new limits could cause closure of existing operations or prevent new planned waste systems from being constructed. The commenter expressed concern about negatively impacting the opportunity for jobs and that oilfield waste is not an issue that is critical or severe in radiation.

RESPONSE: The department does not anticipate any changes to TENORM waste management system models based upon the adoption of the rules because the waste acceptance limit in the newly adopted rules matches the department's existing guidance setting 50 pCi/g as the upper concentration limit. For further discussion regarding the 50 pCi/g concentration limit, see response NO. 27.

COMMENT NO. 29: One commenter pointed out that the natural radiation

present in some clay and shale soils already exceeds the department's proposed waste acceptance limit.

RESPONSE: The department recognizes that soils in Eastern Montana and other parts of the state can be naturally high in radioactivity. The waste acceptance limit in the adopted rules excludes background radiation for the gate screening level and at the boundary at the TENORM waste management system. Therefore, the rules take into account where a TENORM waste management system is located in an area with naturally high background radiation. These rules do not account for background levels at the point of generation (offsite and not at the TENORM waste management system) because TENORM waste is concentrated material that represents the radioactivity signature of the waste.

COMMENT NO. 30: One commenter stated that if levels rise above 50 picocuries and 100 microroentgen, it should automatically trigger closure.

RESPONSE: The department does not agree that automatic closure is warranted. TENORM waste above 50 picocuries per gram and loads above 100 microroentgen are required to be rejected under the rules. The department has the enforcement authority to ensure rigorous and timely compliance with solid waste rules. This enforcement authority includes requiring corrective action to address violations of these rules and could ultimately lead to closure of the TENORM waste management system if determined necessary to protect human health and the environment.

COMMENT NO. 31: One commenter said to stop the trucks at the gate rather than allow them into the facility and, if the radioactivity spikes, stop the trucks completely.

RESPONSE: The department agrees with the comment. The rules prohibit TENORM waste from entering a TENORM waste management system if it exceeds the concentration or gate screening limits in NEW RULE III.

COMMENT NO. 32: A commenter agreed with the decision to remove the NEW RULE III(5) and (6) random inspection requirements specific to incoming loads of filter media, given that NEW RULE VI(1)(n) will still require random inspections of incoming loads of all types of TENORM waste.

RESPONSE: The department appreciates the comment.

COMMENT NO. 33: A commenter suggested specifying how frequently landfill operators need to check the boundary monitors (is it daily, weekly, or monthly?) as well as specifying how frequently landfill operators need to report these measurements to the department regarding the modified requirements for when the TEDE limit is exceeded.

RESPONSE: The TENORM waste management system must have provisions developed by a health physicist for continuous monitoring of ionizing radiation dose at the licensed boundary in their Operation and Maintenance plan in accordance with NEW RULE VI(1)(l). The monitoring must demonstrate the dose a hypothetical person would receive if the person were at the boundary continuously with no shielding for a year. The TENORM waste management system must report

these readings to the department quarterly as set forth in NEW RULE VI(2)(b)(iv). In addition, NEW RULE VI(1)(i)(i) requires annual calibration for radiation detection and monitoring instruments done by a laboratory licensed by an agreement state or NRC, and NEW RULE VI(1)(i)(ii) requires daily source and background check procedures for radiation detection and monitoring equipment.

COMMENT NO. 34: A commenter supported the modified requirements for filter media as long as filter media will indeed be required to be randomly inspected under the existing draft of rules.

RESPONSE: The department appreciates the comment. Filter media is required to be randomly inspected under these rules.

COMMENT NO. 35: One commenter thinks there should be a "big fine" if the landfill does not notify the department as required in NEW RULE III(6).

RESPONSE: Penalties for violation of these rules are prescribed by the Montana Solid Waste Management Act, Title 75, chapter 10, part 2, MCA. A facility's failure to notify the department of a boundary limit exceedance would constitute a violation of these rules subjecting the facility to administrative and/or civil penalties. Penalties assessed must be determined in accordance with the penalty factors in 75-1-1001, MCA.

COMMENT NO. 36: Commenters stated that the department should change the gate screening level for TENORM surface-contaminated objects from 100 microroentgen per hour ( $\mu\text{R/hr}$ ) to 200, excluding background radiation in NEW RULE III(2).

RESPONSE: The department disagrees. See response NO. 24.

COMMENT NO. 37: A commenter suggested that, for TENORM surface-contaminated objects, the gate screening criteria be expressed as an "average" exposure limit, consistent with the characterization method specified for such objects in the "Requirements for the Characterization of TENORM Waste" document.

RESPONSE: The department appreciates the comment, but it has not adopted the suggested changes. The department believes it is sufficient that the requirements for gate screening, including the requirements for calculating an average exposure limit within an individual load, are detailed in the waste characterization document, "Requirements for the Characterization of TENORM Wastes," Montana DEQ – Solid Waste Program (revised June 2020), that is incorporated by reference at NEW RULE I(7).

COMMENT NO. 38: A commenter expressed concern regarding funding for the department to conduct adequate field inspections in eastern Montana.

RESPONSE: The department agrees that the large distances in Montana are challenging for the department to maintain a permanent presence across the state. However, the department does routine field inspections statewide to provide regulatory oversight and provide compliance assistance.

COMMENT NO. 39: Commenters recommended immediately notifying

neighboring landowners and public of groundwater exceedances or other violations. Commenters also recommended notifying landowners, the public, counties, local health departments, newspaper, and law enforcement in the event of any breach, spill, or other calamity. One commenter also requested notification of not just neighboring landowners, but also notifying occupants of neighboring properties, in case the neighboring landowner is not residing at the property.

RESPONSE: The department appreciates the comments. Public notification is required under ARM Title 17, chapter 50, subchapter 13, when groundwater contamination occurs at any solid waste management system in Montana. The final rules incorporate those same public notification requirements in NEW RULE VII. Furthermore, under NEW RULE X, any spill of TENORM waste is required to be reported to state and local Disaster Emergency Services.

COMMENT NO. 40: Commenters recommended that the rules require a TENORM waste management system stop accepting waste when a limit is exceeded, and stop until in compliance and contamination is evaluated and addressed.

RESPONSE: The department appreciates the comment and believes it has been addressed by the amendments to the proposed rules set forth in the supplemental notice. In the department's amended proposal, which is being adopted, a TENORM waste management system that exceeds the boundary limit of 100 mrem/y must immediately stop accepting waste and must submit to the department a corrective action plan that prohibits the acceptance of TENORM waste until the corrective measures have remedied the exceedance.

COMMENT NO. 41: Commenters supported the requirement in the amended proposed rules that a TENORM waste management system stop accepting waste if the Total Effective Dose Equivalent (TEDE) is exceeded at the boundary.

RESPONSE: The department appreciates the comments.

COMMENT NO. 42: One commenter questioned the need for immediate cessation as required in NEW RULE III(6)(a), as the TEDE limit is a long-term based standard. The commenter suggested the rule be amended to read, "cease acceptance of TENORM waste until resolved, if determined necessary by the department."

RESPONSE: The department disagrees. The department is requiring that the TENORM waste management system not accept TENORM waste until the exceedance has been remedied. This ensures that the corrective actions are able to remedy the exceedance. It also allows the department to require the facility to implement closure and post-closure plans, if necessary, to protect human health and the environment.

COMMENT NO. 43: A commenter recommended changing the notification requirement in NEW RULE III(6)(b) from "within 24 hours" to "within 1 business day" to ensure access to department staff for reporting.

RESPONSE: The department is adopting 24 hours because it is a reasonable timeframe to notify the department by telephone or electronically. The

department's previous experience working with waste management systems has demonstrated that 24 hours is enough time for a facility to notify the department. Requiring notice within 24 hours would allow the department to act more quickly on working with the owner or operator of the TENORM waste management system to implement a corrective action plan and follow a closure and post-closure care plan, if necessary, to protect human health and the environment.

COMMENT NO. 44: Commenters support the requirement that all loads entering the facility undergo gate screening for exposure and the protocols for rejecting loads.

RESPONSE: The department appreciates the comments.

COMMENT NO. 45: A commenter recommended that NEW RULE III(3)(a) be amended to make clear that information required to be included on the manifest may be included on associated documents rather than the manifest itself. Specifically, the commenter is concerned that waste characterization documents will be difficult to include on the manifest itself, given the level of detail involved.

RESPONSE: The department agrees. The department has made this change to avoid confusion and provide clarity.

COMMENT NO. 46: The department received numerous comments requesting the rules institute tonnage limits at each TENORM waste management system, such as not exceeding 25,000 tons per year or 3,000 tons in a single month.

RESPONSE: The department disagrees. Each TENORM waste management system must have a specific design and a site-specific Operation and Maintenance (O&M) Plan, which will dictate the maximum annual tonnage allowed at the facility. Site designs and O&M plans are approved by the department on a case by case basis. Also, there is not a direct correlation between tonnage received at a facility and the NRC recommended dose limit of 100 mrem per year at the boundary due to operational practices.

COMMENT NO. 47: A commenter suggested that if the average radioactivity concentration within the landfill is discovered to have been exceeded or if contamination is discovered in ground water monitoring wells, the department should be required to make a determination within 15 days as to whether the landfill should stop accepting waste for a specific time period in order to allow for corrective action/remediation and/or follow closure or post-closure care.

RESPONSE: The department appreciates the comment and believes it has been addressed by the amendments to the proposed rules set forth in the supplemental notice. See response NO. 40.

COMMENT NO. 48: Commenters suggested that the TENORM waste management system notify the department within 24 hours and provide immediate public notice if 100 mrem at the boundary is exceeded.

RESPONSE: The department appreciates the comment and has addressed the 24-hour notification in the amendments to the proposed rules set forth in the supplemental notice. The department is not requiring public notification because

every boundary limit exceedance is not necessarily an emergency situation. However, this does not preclude the department from providing public notification if there is an immediate threat to human health and the environment. In addition, the facility must immediately stop accepting TENORM waste if the boundary limit is exceeded. Furthermore, the rules require corrective actions to remedy the exceedances. The department may require the TENORM waste management system to follow closure and post-closure plans, if necessary, to protect human health and the environment. See responses NO. 39 and NO. 40.

COMMENT NO. 49: A commenter suggested making the boundary limit 25 mrem per year.

RESPONSE: The department does not agree with the comment. The dose limit for members of the public for operating licensed facilities under Nuclear Regulatory Commission (NRC) regulations is 100 mrem per year (mrem/y) excluding background and medical exposures [10 CFR 20.1301(a)(1)]. This is an internationally accepted annual dose limit for members of the public for planned exposure situations such as operation of a licensed TENORM landfill. In contrast to most other licensed or permitted operations involving the use or disposal of radioactive materials, the TENORM landfill worker is considered a member of the public rather than a "radiation worker" (the maximum allowable dose to a radiation worker is 5,000 mrem/y). Radiation doses must be kept as low as reasonably achievable taking into account the purpose for the activity (ALARA). Nuclear Regulatory Commission regulations in 10 CFR Part 20 are not applicable to TENORM because naturally occurring radioactive materials are not addressed in the Atomic Energy Act. It is up to individual states to develop TENORM regulations. However, it is reasonable for the department to be consistent with NRC regulations and the International Atomic Energy Association's standard for the public dose of 100 mrem/y.

COMMENT NO. 50: Commenters support the requirement that facilities must monitor for Total Effective Dose Equivalent at the facility boundary.

RESPONSE: The department appreciates the comments.

COMMENT NO. 51: Several commenters stated that the department should be notified immediately as well as county disaster services when the boundary limits have been exceeded.

RESPONSE: The department appreciates the comments but has not made the proposed change. The department would work with local entities as appropriate if the boundary limit is exceeded but requiring facility notification of local disaster and emergency services would not be appropriate, as a boundary limit exceedance is not necessarily an emergency situation. Regarding notification to the department, 24 hours is the maximum time limit in which a boundary limit exceedance must be reported, but the facility must immediately stop accepting TENORM waste if the boundary limit is exceeded. Furthermore, the rules require corrective actions to remedy the exceedance and the department may require the TENORM waste management system to follow closure and post-closure plans, if necessary, to protect human health and the environment.

COMMENT NO. 52: A commenter suggested that the information on the manifest required under NEW RULE III(3)(a) should include the U.S. Department of Transportation number that goes with that truck and that company.

RESPONSE: The department agrees with the comment and has incorporated this change into the final rules. Requiring the transporter's U.S. Department of Transportation number on the manifest will allow for easier tracking of the waste by the department.

COMMENT NO. 53: A commenter pointed out that, in New Rule IV(2)(d), the subparagraphs currently numbered (2)(d)(v), (vi), and (vii) should be renumbered as (2)(e), (f), and (g). The plans required under those subsections are not related to the material that should be included in the detailed site plan under (2)(d), but instead are separate plans required to be included in the application under (2).

RESPONSE: The department agrees with the comment and has incorporated the change into the final rules to provide clarity and to avoid confusion.

COMMENT NO. 54: Commenters suggested that the rules should have provisions for public notice regarding TENORM license applications both in the county newspaper of record as well as statewide newspapers. Commenters also requested personal notice to surrounding landowners and county commissioners.

RESPONSE: Under existing rules and practice, the department issues public notice and provides opportunity for the public to review proposed licensing decisions as well as the department's draft environmental review document disclosing potential impacts to human health and the environment from the proposed licensing action. In addition, the Montana Solid Waste Management Act requires that the department notify the local health officer within 15 days of receipt of an application, but it does not provide for public notice of the department's receipt of an application. Because changes to the application are often needed to comply with solid waste rules, the department does not believe it is warranted to include a requirement for public notice of the department's initial receipt of an application.

COMMENT NO. 55: Commenters expressed that liners should be required to match the thickness required by North Dakota's administrative rules. Under North Dakota rule, liners must include at least 3 feet of re-compacted clay with hydraulic conductivity not to exceed  $1 \times 10^{-7}$  cm per second overlain with at least a 60 mil flexible membrane liner.

RESPONSE: The department does not agree with this comment. The reason that EPA allowed for state specific solid waste management regulatory framework is because of the diversity of site conditions across the country. Montana is a prime example of why current administrative rules require that a facility be designed to ensure that facility operations do not result in contamination of the uppermost aquifer. EPA also prescribed a standard liner design that is applicable nationwide for waste management systems that is protective of the environment. The department utilizes EPA's prescribed liner requirements as the minimum standard for Montana solid waste systems. While it makes sense to prescribe

composite liner systems with hydraulic conductivity standards in certain areas, the same environmental protection and additional costs are not warranted in others. Nevertheless, each facility design is evaluated based upon the site-specific characteristics. The rules require Class II facilities be designed to prevent contamination of the uppermost aquifer and provide for the use of the prescriptive liner design or an equivalent alternative design based upon site-specific characteristics. In some cases that might be 100 mil, 80 mil, or other depending upon the hydrogeologic conditions.

COMMENT NO. 56: A commenter suggested that the Engineer of Record for the facility should oversee and certify the installation of the liner, including testing of the compacted clay bedding and verification that the liner has been properly welded/installed and covered with suitable cover fill to be protective of liner integrity.

RESPONSE: The department appreciates the comment. Liner design construction and testing follow standard engineering practices that have been carried out by Montana solid waste systems over the last 25 years. Prior to the placement of waste in a newly constructed landfill, the department conducts a thorough review of the installation. ARM 17.50.1205(5) requires submittal to the department for approval, a construction quality control (CQC) and construction quality assurance (CQA) plan describing procedures that conform with the department-approved design plans. ARM 17.50.1205(6) requires, within 60 days after construction of a Class II or Class IV landfill unit is completed, that the owner or operator submit to the department for approval a final CQC and CQA report that describes, at a minimum, construction activities and deviations, and conformance with the approved CQC/CQA plan. ARM 17.50.1205(7) requires that the owner or operator submit a certification, by an independent Montana licensed professional engineer, that the project was constructed according to the CQC/CQA plan. These rules are incorporated into the TENORM rules at NEW RULE I(4) and NEW RULE V(1)(b).

COMMENT NO. 57: Commenters expressed concern with sharp and large, bulky objects that have the potential to puncture the liner. Some commenters also expressed concern regarding the landfill being allowed to define its own safety protocols for dealing with sharp and large, bulky objects.

RESPONSE: The department appreciate the comments. Concerns regarding sharp, heavy, and bulky materials damaging a liner system are addressed under NEW RULE VI. All Class II waste management systems, including TENORM waste management systems, must include in their Operation and Maintenance (O&M) Plan procedures to protect the integrity of the liner from objects that could compromise it, such as large, bulky items. The department does not want to be overly prescriptive for O&M plans. Each waste management system and site is unique and should be evaluated on a case by case basis. O&M plan requirements currently in place ensure that the integrity of a liner system will be maintained and must be approved by the department.

COMMENT NO. 58: Commenters suggested testing storm water ponds for radionuclides.

RESPONSE: NEW RULE VI(4) requires monitoring for possible contamination in storm water ponds. The department is proposing to require the owner or operator to test storm water for constituents or parameters based on the waste stream. Owners and operators would be required to obtain a storm water permit from the department's Water Protection Bureau, which regulates discharges of storm water, and to develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would include best management practices, quarterly inspections, and sampling after significant storm events. TENORM waste management systems must divert storm water and prevent it from commingling with waste. The department is proposing in NEW RULE VI(5) to require an owner or operator to take corrective action measures if there are exceedances of limits in the storm water ponds to protect human health and the environment. The department is also proposing to require the owner or operator to notify the department's Water Protection Bureau of any exceedances because this bureau is responsible for the management of storm water.

COMMENT NO. 59: Commenters suggested requiring corrective actions if radioactivity is at high concentrations in storm water ponds.

RESPONSE: The department agrees. If radionuclides or any other constituent deemed necessary for testing is found to be at levels unsafe for human health and the environment corrective actions would be taken. NEW RULE VI(5) requires corrective actions to be taken if monitoring detects an exceedance of a constituent or parameter.

COMMENT NO. 60: The department received comments expressing concern with the siting of TENORM waste management systems, specifically with regard to the environmental conditions in Eastern Montana as well as the potential for TENORM waste management systems to be located near residential areas.

RESPONSE: Requirements for site selection are outlined in ARM Title 17, chapter 50, subchapter 10, which is incorporated into these rules at NEW RULE V(1). These site selection requirements include restrictions on siting a landfill near airports, floodplains, wetlands, fault areas, seismic areas, unstable areas, and other location restrictions. Subchapter 10 also contains requirements to protect public and private drinking water supply systems, sensitive hydrogeological environments, and endangered or threatened plants, fish, and wildlife from potential negative impacts associated with solid waste disposal. In addition, site selection must comply with applicable local zoning, and a certification from the relevant zoning authority is required to be submitted with the application for a TENORM waste management system license.

COMMENT NO. 61: A commenter recommended testing storm water within 3 days of any precipitation over 1/2 inch of moisture.

RESPONSE: The department disagrees. Testing storm water within 3 days of any precipitation over 1/2 inch of moisture is too prescriptive. The storm water ponds must be designed to handle a 100-year/24-hour storm event. The precipitation amount that triggers monitoring will be based upon the exceedance of

the site-specific precipitation amount for the designed event. Precipitation amounts are determined by local weather data from the national weather service. In addition, the storm water pond must be consistent with the requirements of the storm water permit approved by the department's Water Protection Bureau. TENORM waste management systems are required to work with the department's Water Protection Bureau to obtain a storm water permit and develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include best management practices, quarterly inspections, and sampling after significant storm events. TENORM waste management systems would be required to divert storm water away from waste and prevent it from commingling with waste.

COMMENT NO. 62: A commenter recommended requiring storm water be tested quarterly and after major precipitation and run-off events for radioactivity, diesel range organics, and other constituents as included in the April 2019 pre-publication draft of the rules (NEW RULE VI).

RESPONSE: See responses NO. 58 and 59.

COMMENT NO. 63: Commenters suggested testing storm water for other constituents, not just radionuclides, but also the host of volatile organic compounds on a regular basis.

RESPONSE: See response NO. 58.

COMMENT NO. 64: A commenter wants the department to require storm water retention ponds to be lined with a composite liner, as included in the April 2019 pre-publication draft of the rules that were shared with the TENORM workgroup.

RESPONSE: The department does not agree with the comment. After further discussion and technical input from the department's Water Protection Bureau, the department determined that requiring storm water ponds to be lined in these rules is not appropriate. Requiring a liner is contrary to current state of practice for designing storm water ponds. Storm water ponds are designed to facilitate the settlement of fine sediments or other particulates, which are transported during high velocity flows over the surface of the ground. Storm water ponds are also designed to recharge the ground water by permeating through the soil. TENORM waste management systems must be designed to divert storm water from contacting the waste. Therefore, storm water ponds only receive high velocity flows in contact with land without any waste on it or from direct rainfall or precipitation events. Lined ponds often have difficulty with siltation, which can lead to reduction in capacity and possibility of compromising the capacity of the storm water pond.

COMMENT NO. 65: Several commenters want requirements to monitor leachate quarterly for quality and quantity, and after major precipitation events. The commenters also want leachate to be removed if leachate pond levels approach 30 cm in the leachate sump and require the removal and off-site disposal of excess leachate rather than recirculate it. Commenters also want to see leachate managed at a minimum of one-foot total head volume, or less, on the landfill's protective liner.

RESPONSE: Leachate monitoring and management for Class II landfills are already required in Montana's solid waste rules. See ARM 17.50.1204 and 17.50.1205. These requirements are incorporated into the TENORM rules at NEW RULE V. Based upon the department's experience with Class II landfills, these rules are adequate in addressing leachate monitoring and management. Class II landfills may remove leachate and properly dispose of it off-site.

COMMENT NO. 66: Commenters want the department to make reports available to public, state, and nearby landowners.

RESPONSE: Reports are publicly available. Any person may visit the department's website (<https://deq.mt.gov/Public>) to request public records or may contact the department at (406) 444-5300 for assistance with this process.

COMMENT NO. 67: A commenter stated that money should be set aside to maintain future leachate maintenance.

RESPONSE: Engineering design and Operation and Maintenance plans include budgeting for the upkeep and maintenance of the leachate management systems. Financial assurance would also encompass future leachate maintenance costs. Future leachate maintenance would also be covered under the TENORM waste management system's Closure and Post Closure Care plan.

COMMENT NO. 68: A commenter wants leachate to be tested for radon, radium 226, radium 228, alpha particle activity, uranium, and benzene. The commenter also wants the department to specify how frequently leachate should be tested and by whom.

RESPONSE: The department disagrees with the comments. See response NO. 65.

COMMENT NO. 69: A commenter stated that the rules need to protect drinking water.

RESPONSE: The department acknowledges the comment. Solid waste regulations are designed to protect the uppermost aquifer. Pursuant to ARM 17.50.1009, which is incorporated into these rules at NEW RULES I(4) and V(1), facilities must be located in a manner that does not allow the discharge of pollutants in excess of state standards for the protection of state waters, public water supply systems, or private water supply systems. The department has a Drinking Water Program to monitor and oversee required public drinking water system sampling. The Drinking Water Program inspects drinking water systems and provides technical and compliance assistance to ensure clean water. Public water systems are required to test for maximum contaminant levels for radiological contaminants. If exceedances are detected, public notification is required. In addition, the department has a Source Water Assessment and Protection Program. The department conducts source water assessments that analyze existing and potential threats to the drinking water of public drinking water supplies.

COMMENT NO. 70: A commenter suggested that the department coordinate

siting facilities with local government and establish local government partnerships.

RESPONSE: Requirements for site selection and design criteria are outlined in ARM Title 17 chapter 50, subchapter 10 and subchapter 11, which are incorporated into these rules at NEW RULES V(1) and VI(1). Under existing rules and practice, the department issues public notice and provides opportunity to review proposed licensing decisions as well as the department's draft environmental review document disclosing potential impacts to human health and the environment from the proposed licensing action. Licensing for solid waste management systems includes local government involvement as required in 75-10-222 and 75-10-223, MCA. Cities, towns and counties use various mechanisms to guide land uses, including but not limited to local zoning ordinances, growth management plans, and land use plans. The department intends to work with other states, federal, and local governments to form partnerships in dealing with TENORM waste management issues to minimize the duplication of regulation and to provide consistency with other regulatory entities where appropriate.

COMMENT NO. 71: Several commenters stated that TENORM waste management sites should be at clay or shale soil sites. A commenter stated that TENORM waste management systems should be located in areas where potential for groundwater contamination is low. One commenter stated that there should be a 50-foot separation between the liner and the water table, and a TENORM waste management system should have a lateral distance of 1,000 feet from any perennial surface water. A commenter also stated that when siting a TENORM waste management system seasonal fluctuations of the water table and its highest level should be considered.

RESPONSE: Requirements for site selection and design criteria are outlined in ARM Title 17 chapter 50, subchapter 10 and subchapter 11, which are incorporated into these rules at NEW RULES V(1) and VI(1). ARM 17.50.1009, incorporated into these rules at NEW RULE V(1)(a), requires the siting of a landfill to include adequate separation of wastes from underlying ground water or adjacent surface water, and the owner or operator of the facility is required to demonstrate that the facility is located in a manner that does not allow the discharge of pollutants in excess of state standards for the protection of state waters, public water supply systems, or private water supply systems.

COMMENT NO. 72: Commenters stated that inspections done by the department should be unannounced.

RESPONSE: Pursuant to 75-10-205, MCA, the department has continuing authority and responsibility to inspect solid waste management systems. Inspections may be conducted only during reasonable hours and only after presentation of appropriate credentials. The department is not required to announce when it will be conducting an inspection.

COMMENT NO. 73: Commenters stated that inspections done by the department should be done monthly or to the maximum extent possible.

RESPONSE: The department appreciates these comments. The frequency of inspections at solid waste management systems varies. Most facilities will be

inspected at a minimum two times annually or more frequently based upon compliance status of the facility. Conducting monthly inspections of all solid waste management systems is beyond the resources of the department.

COMMENT NO. 74: Commenters support that facilities be built to handle the water volume resulting from a 24-hour/100-year storm.

RESPONSE: The department appreciates the comments.

COMMENT NO. 75: Commenters stated that department inspections need to include more than record review and taking photos. Commenters stated that the department should take ground water and other samples of various media.

RESPONSE: Solid waste management system inspections include onsite visits to observe onsite management and operational practices. Inspectors also provide compliance assistance and make recommendations to remedy violations or require corrective actions. Persistent violations may be referred to the department's Enforcement Division and Legal Unit for resolution. The inspector has discretion to sample environmental media if deemed necessary to ensure compliance.

COMMENT NO. 76: A commenter stated that the department needs more than two regulators for the whole state.

RESPONSE: Staff resources for the solid waste program are based upon several factors, including the budget approved by the Montana Legislature. Currently, the department's Solid Waste Program has 7 staff, including 5 inspectors.

COMMENT NO. 77: A commenter asserted that there is a lack of justification in the proposed rules for requiring more stringent run on and run off control systems for TENORM waste management systems (designed for 24-hour/100-year storm events) than for other Class II solid waste management systems (designed for 24-hour/25-year storm events). The commenter suggested that TENORM waste management systems should be subject to the same run on and run off design requirements as all other Class II solid waste management systems.

RESPONSE: The department appreciates the comment but disagrees with the suggested revisions to the rules. The final rules require that a TENORM waste management system be designed for a 24-hour/100-year storm due to concerns raised during the stakeholder outreach process regarding the frequency of high intensity storms over a short period of time and the possibility of compromising dams that were not designed to handle those type of storm events. TENORM waste is "special waste," defined in 75-10-802(8), MCA, as "a solid waste that has unique handling, transportation, or disposal requirements to ensure protection of the public health, safety, and welfare and the environment." The department is requiring more stringent requirements for TENORM waste management systems in terms of storm water control than other Class II landfills due to the special nature of this waste stream.

COMMENT NO. 78: A commenter asked if waste will be covered with one foot of other material, such as clay.

RESPONSE: The department is proposing at least six inches of clean and compacted soil or an alternative daily cover that has been approved by the department under ARM 17.50.1104 pursuant to NEW RULE VI(2)(d).

COMMENT NO. 79: Several commenters want the department to charge adequate fees to cover cleanup, management, and enforcement.

RESPONSE: The department appreciates the comment. NEW RULE IX requires TENORM waste management systems to have department-approved financial assurance mechanisms in place for closure and post-closure care, as well as corrective action as necessary. The department has an Enforcement Division that already has funding mechanisms in place to ensure rigorous and timely compliance with solid waste rules.

COMMENT NO. 80: Several commenters stated they want the department to perform its own environmental monitoring, including taking radioactivity samples and making the results available to the public. One commenter stated that the department's monitoring should be funded by landfill operators.

RESPONSE: The department appreciates the comments but disagrees that department-collected samples should be required in all circumstances. The department has the discretion to take samples of ground water, leachate, storm water, soil and air quality at a facility any time it deems is necessary to ensure compliance. Setting a quarterly schedule is not reasonably necessary to protect human health and the environment, nor is it cost or time effective for the department. TENORM waste management systems must follow chain of custody, proper sampling procedures, and use department-approved laboratories. TENORM waste management systems must also have ground water sampling plans, operation and maintenance plans, and quality control/quality assurance plans to ensure that sampling is done properly. These plans are reviewed routinely on inspections by the department. All Class II waste management systems, including TENORM waste management systems, in Montana are already required to pay license and application fees in accordance with ARM Title 17, chapter 50, subchapter 4.

COMMENT NO. 81: Commenters suggested that ground water should be monitored monthly.

RESPONSE: The department disagrees. Variation in ground water fluctuation is seasonal in nature rather than varying month to month. Migration or changes in ground water level are minimal. Ground water quality measured in parts per million are also minimal, conservative, and must be verified statistically to detect any changes. Properly timed water quality monitoring schedules and statistical analyses of the data on a semi-annual or quarterly basis have demonstrated an effective mechanism for indicating trends or changes in water quality over time. All solid waste ground water sampling requirements are based on federal regulations that have been tested and verified to be protective of human health and the environment. The department may increase the frequency of ground water monitoring, if necessary, to protect human health and the environment.

COMMENT NO. 82: A commenter expressed disagreement that an

independent third-party should be required to perform groundwater sampling under NEW RULE VII. The commenter noted that facility owners and operators are responsible for ensuring compliance with these rules and are subject to enforcement if those requirements are not appropriately met, whether they perform the required activities themselves or via third parties. The commenter recommended that, if a facility has an employee who meets the definition of a "qualified ground water scientist," it should be authorized to perform the monitoring requirements itself.

RESPONSE: The department appreciates the comment but disagrees with the suggested revisions to the rules. The current state of the practice at licensed Class II landfills in Montana is to use third-party consultants to conduct ground water monitoring. Requiring a third-party to perform water sampling ensures objectivity for ground water sampling procedures.

COMMENT NO. 83: Commenters stated that both wells and leachate should be monitored quarterly for water quality and quantity, and that storm water should be monitored after any major precipitation event. A commenter asked how the department will ensure the licensee is collecting samples that capture seasonal variation in groundwater levels and/or flow.

RESPONSE: The department appreciates the comments. Consistent with all Class II waste management systems, TENORM waste management systems must conduct semi-annual ground water monitoring and leachate monitoring. Leachate monitoring requirements can be found under Montana's solid waste rules at ARM Title 17 chapter 50, subchapter 11. Under ARM 17.50.1305, which is incorporated into these rules at NEW RULES I(4) and VII(1), TENORM waste management systems must comply with the ground water monitoring plan requirements in ARM Title 17, chapter 50, subchapter 13, which includes having a ground water sampling and analysis plan (SAP) tailored to the types of TENORM waste being managed and the site-specific conditions. Quarterly monitoring may be required if deemed necessary by the department to protect human health and the environment. The SAP must also include schedules for capturing seasonal variation in ground water levels and or flow. The SAP, and changes to the SAP, must be approved by the department.

Under NEW RULE V, an application for a TENORM waste management system license must contain a system design that complies with the requirements of the Montana Pollutant Discharge Elimination System (MPDES) general storm water permit approved by the department's Water Protection Bureau. The design of the TENORM waste management system must be consistent with the requirements of the storm water permit approved by the department. TENORM waste management systems are required to work with the department's Water Protection Bureau to obtain a storm water permit and develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include best management practices, quarterly inspections, and sampling after significant storm events. TENORM waste management systems would be required to divert storm water away from waste and prevent it from commingling with waste. See response NO. 81.

COMMENT NO. 84: Commenters support the requirement that all ground

water monitoring must be done by an independent third-party ground water scientist.

RESPONSE: The department appreciates the comments.

COMMENT NO. 85: A commenter suggested that monitoring should be done by the department, a third-party ground water scientist, and by nearby landowners.

RESPONSE: Nearby landowners may conduct monitoring on their own property, but do not have the authority to perform monitoring on property owned by the facility. See response NO. 80.

COMMENT NO. 86: A commenter suggested that monitoring should be done into perpetuity.

RESPONSE: ARM Title 17, chapter 50, subchapter 14 sets forth post-closure care requirements for Class II solid waste management systems that includes ground water sampling for a time period that ensures that there is ongoing protection of the environment and public after the waste management system closes. The provisions are incorporated into the rules being adopted at NEW RULES I(4) and VII(1).

COMMENT NO. 87: Commenters expressed concern about ground water contamination, and stated that aquifers, including the Missoula aquifer, should be kept clean and pristine. Commenters expressed concerns that aquifers would not be adequately protected by landfill liners.

RESPONSE: The department appreciates the comments and understands the concern for aquifers throughout the state, including the Missoula aquifer. Existing rules for Class II solid waste management systems incorporate requirements for modern liner design to protect ground water aquifers. See responses NO. 42 and 56.

COMMENT NO. 88: A commenter stated that if radionuclide limits are exceeded above drinking water standards, the department should be required to notify landowners within a 5-mile radius of the TENORM waste management system, notify the list of interested parties maintained during rulemaking, and place a public notice in the newspaper of operating record in the county in question.

RESPONSE: The rules require a ground water monitoring plan that complies with ARM Title 17, chapter 50, subchapter 13. This subchapter has provisions for public notification. See response NO. 69.

COMMENT NO. 89: Commenters stated that the department should cooperate with local governmental agencies on spill reporting and response. The department should consider inter-local agreements and partnerships regarding the management of TENORM waste.

RESPONSE: The department agrees. The department has modified NEW RULE X to include notification of local DES of a spill of TENORM waste as soon as practicably possible, but in no case later than 24 hours following the spill. This will allow local DES to alert local government responders that they are responding to a TENORM area. Responders such as EMTs, fire fighters, deputy sheriffs, and DES personnel would have no other way of knowing since there is no requirement that

TENORM be placarded in transportation. In addition, all solid waste management system applications must include local government sign-off for health and environmental considerations, as well as local zoning requirements.

COMMENT NO. 90: Commenters suggest requiring contacting County DES and/or Sheriff's departments for spills and communicating with appropriate county officials. Notify public and affected landowners as soon as possible.

RESPONSE: See response NO. 89.

COMMENT NO 91: Several commenters expressed concern regarding derailment of TENORM waste in Montana or spills on highways and the potential of contamination of rivers and streams.

RESPONSE: The department appreciates these comments. NEW RULE X addresses the response to and management of spills of TENORM waste, in order to protect the environment.

COMMENT NO. 92: Commenters expressed concerns regarding an existing solid waste management system licensed to accept TENORM waste.

RESPONSE: The department appreciates the comments. Citizens who believe they have observed a violation of environmental laws at existing facilities are encouraged to contact the department's Enforcement Division by filling out an online spill/complaint form available at <http://deq.mt.gov/reporting> or by calling department enforcement staff at (406) 444-0379.

COMMENT NO. 93: A commenter stated that all spills, no matter the size, need to be reported, contained, and removed.

RESPONSE: The department agrees that spills should be reported, contained, and removed, but has excluded spills smaller than one cubic yard from this requirement. The department has determined that one cubic yard (approximately half a pickup load) is a practical amount that can be recovered and disposed of properly. Smaller amounts would not be reasonably recovered and would mix with existing material onsite. This is consistent with the department's Spill Policy, available at:  
[http://deq.mt.gov/Portals/112/DEQAdmin/ENF/Documents/SpillPolicy\\_02\\_2016.pdf](http://deq.mt.gov/Portals/112/DEQAdmin/ENF/Documents/SpillPolicy_02_2016.pdf).

COMMENT NO. 94: Commenters suggested that the rules require immediate notification of spills instead of 24 hours.

RESPONSE: The department does not believe immediate spill notification is warranted. Immediate notification is not always possible, particularly in the case of motor vehicle accidents. Nevertheless, the department has changed the final rules to require notification as soon as practicable, but in no case more than 24 hours following the spill.

COMMENT NO. 95: A commenter suggested notifying "as soon as practically can be done" instead of 24 hours for spills. Immediately cannot always be done in cases of vehicle wrecks. The commenter also recommended making sure local

DES know it is TENORM due to potential risk ingestion or inhalation.

RESPONSE: The department agrees that, while immediate notification is not always possible, it is imperative that state and local DES be notified of spills as soon as possible, so that they may respond promptly, safely, and appropriately. Therefore, the department has amended the notification requirement in NEW RULE X to require notification as soon as practicable, but no more than 24 hours, to ensure that the rule is enforceable.

COMMENT NO. 96: A commenter suggested transporting waste in sealed containers.

RESPONSE: If filter media is shredded and wetted down, then this waste must be transported in sealed containers as required in the department's Waste Characterization Document, May 2020. Other loads must be covered as required in existing solid waste rules.

COMMENT NO. 97: A commenter stated that trucks spew dust, are not always covered, and there is radioactive material dripping off trucks.

RESPONSE: Under ARM 17.50.523 and NEW RULE X(2), a person transporting TENORM waste must ensure it is transported in such a manner so as to prevent its discharge, dumping, spilling, or leaking from the transport vehicle. In addition, oilfield exploration and production waste must be covered while in transit. Any person observing a potential violation of these transport rules is encouraged to notify the department by filling out an online spill/complaint form available at <http://deq.mt.gov/reporting> or by calling department enforcement staff at (406) 444-0379.

COMMENT NO. 98: Several commenters expressed concern for the rules to better protect water, wildlife, and people and that the department should follow the Montana Constitution's mandate for a clean and healthful environment. Several commenters also stated that the rules favor industry and money over health.

RESPONSE: The department appreciates the comments. The proposed rules have been strengthened to include provisions to further address protection of human health and the environment. Public input on these issues has been considered and incorporated where applicable into the final rules.

COMMENT NO. 99: A commenter stated that the critical part of the department rules is the assignment in perpetuity of liability for the environmental impacts caused by failures at TENORM sites.

RESPONSE: See response NO. 86.

COMMENT NO. 100: A commenter stated that the department should force oil and gas companies to set aside money for every oil well drilled for cleanup, remediation, and reimbursement of neighboring properties.

RESPONSE: The department appreciates the comment, but it is out of the scope of this rulemaking. The rules being adopted today concern the disposal of TENORM waste under the Montana Solid Waste Management Act, Title 75, chapter

10, part 2, MCA. The department does not have regulatory authority over oil wells. That regulatory authority rests with the Montana Board of Oil and Gas Conservation.

COMMENT NO. 101: A commenter stated that if someone dumps illegally, the department should catch them and give them the maximum punishment.

RESPONSE: Penalties for violation of these rules are prescribed by the Montana Solid Waste Management Act, Title 75, chapter 10, part 2, MCA. Penalties assessed must be determined in accordance with the penalty factors in 75-1-1001, MCA. The department relies heavily on evidence provided from those witnessing potential illegal activity. Citizens are encouraged to report illegal dumping to the department. See response NO. 92.

COMMENT NO. 102: A commenter said that there needs to be prompt and thorough corrective action if a TENORM waste management system violates any of the department's solid waste rules.

RESPONSE: The department agrees. The department provides timely compliance assistance and regulatory oversight of all waste management systems. The department addresses violations or non-compliance, and other operational issues on a case by case basis with each waste management system. The department has the authority to require a TENORM waste management system to stop accepting waste if necessary. Waste management systems that are out of compliance may be referred to enforcement if necessary.

COMMENT NO. 103: Several commenters expressed concerns regarding climate change and global warming. Commenters discussed climate disruption due to burning fossil fuels and exacerbation of climate change by industry. One commenter recommended using solar and wind energy rather than fossil fuels.

RESPONSE: The department appreciates the comments, but they are not within the scope of this rulemaking.

COMMENT NO. 104: Several commenters expressed concerns regarding radiation health risks and safety at TENORM waste management systems.

RESPONSE: The department appreciates the comments regarding radiation health risks. The proposed rules require a radiation health and safety plan. The acceptance limits, boundary limits, and gate screening limits are proposed to protect human health.

COMMENT NO. 105: A commenter raised concerns regarding the use of appropriate survey equipment, stating that survey equipment that is not optimized for the detection of medium and energetic Beta radiation as well as having a broad sensitivity to both low and high energy x- and gamma radiation can yield exposure measurements that fail to detect as much as half of the radiation that contributes a significant radiological dose to workers in a radiation environment created by mixed radionuclides.

RESPONSE: The department appreciates the comment. The proposed rules are dealing with TENORM waste that has relatively low radioactive signatures and which occurs naturally in the background. NEW RULE VI requires procedures for

proper calibration and annual certification of instrumentation, as well as requires a radiation health and safety plan.

COMMENT NO. 106: A commenter expressed concern that there has been undue influence to "make cheap and easy" disposal of wastes that has been brought to bear on the department staff by the oil and gas industry.

RESPONSE: The department disagrees with the comment. The department's mission is to protect human health and the environment, and, to that end, the department has engaged various resources and stakeholders throughout the rulemaking process to ensure the rules meet the mission of the department. TENORM is an emerging special waste in Montana and includes but is not limited to oil and gas exploration and production waste. These rules apply to all waste streams producing TENORM wastes, including, for example, wastewater treatment filters.

COMMENT NO. 107: A commenter expressed concerns about trucks washing off near her son's school.

RESPONSE: The department understands the concern about trucks washing off near her son's school. Department staff visited the proposed truck wash after the Glendive public hearing and made some calls to address this comment. Ultimately, it does not appear to be a regulatory matter under the department's authority, but representatives of the truck wash and the school were encouraged to better communicate and work out any concerns.

COMMENT NO. 108: A commenter suggested that the department pay attention to TENORM at Colstrip.

RESPONSE: The department appreciates the comment, but site-specific concerns are not within the scope of this rulemaking.

COMMENT NO. 109: A commenter would like to see in the rules, a requirement that, if the waste begins to migrate to the neighboring properties, the owners, or the state, be required to purchase those properties.

RESPONSE: The department appreciates the comments, but the department does not have authority under the Montana Solid Waste Management Act to purchase private property or to require the owner or operator of a facility to purchase a neighboring property.

COMMENT NO. 110: Commenters expressed concerns about pipeline breaks.

RESPONSE: The department understands concerns about pipeline breaks, but the comments are not within the scope of this rulemaking.

COMMENT NO. 111: A commenter discussed concerns about Ballentine and nitrate contamination of drinking water.

RESPONSE: The department appreciates the comments. Public drinking water concerns are handled by the department's Public Water Supply Bureau and these comments are not within the scope of this rulemaking. See response NO. 56.

COMMENT NO. 112: A commenter discussed concerns about the 2011 Exxon Mobile Silvertip pipeline spill and East Helena groundwater contamination.

RESPONSE: The department appreciates the comments, but they are not within the scope of this rulemaking.

COMMENT NO. 113: Several commenters discussed concerns about Colstrip wastewater ponds.

RESPONSE: The department appreciates the comments, but they are not within the scope of this rulemaking.

COMMENT NO. 114: Several commenters expressed concern regarding illegal dumping of TENORM in Oregon.

RESPONSE: The department is aware of the recent news reports of a facility in Oregon accepting TENORM waste in violation of the TENORM waste acceptance limits under Oregon law. The rules being adopted include requirements for gate screening and waste characterization to ensure that TENORM waste management systems are only accepting waste within the limits set by these rules. The department remains concerned with the potential for illegal dumping of TENORM waste that exceeds the acceptance limits being adopted into rule. The department will work with stakeholders and neighboring states to address the issue of illegal dumping and how to ensure that higher concentration loads will be disposed of at proper facilities that are licensed to accept loads higher than 50 pCi/g.

COMMENT NO. 115: A commenter provided comments on the department's separate document titled, "Requirements for the Characterization of TENORM Wastes" for waste characterization. The commenter supported the department's commitment in the reason section of NEW RULE I, at the top of page 1243, that if amendments to the waste characterization document are needed, then the department will propose to amend the document through future rulemaking, which will allow for appropriate notice and comment.

RESPONSE: The department appreciates the comments.

COMMENT NO. 116: A commenter provided comments on the department's separate document titled "Requirements for the Characterization of TENORM Wastes" for waste characterization. The commenter recommended the gate screening in (4) should be increased to 200  $\mu$ R/hr. However, rather than addressing the numerical screening level specifically in this document, which is intended to address the waste characterization methods, the commenter recommended that it simply be replaced with a reference to NEW RULE III(2) to ensure consistency.

RESPONSE: The department disagrees with increasing the gate screening to 200  $\mu$ R/hr. See response NO. 24. The department does agree that removing the numerical screening level in the document and replacing it with a reference to NEW RULE III(2) is appropriate and would provide consistency.

COMMENT NO. 117: A commenter provided comments on the department's

separate document titled "Requirements for the Characterization of TENORM Wastes" for waste characterization. The commenter said (5) should be changed for clarity and to avoid confusion to read "(5) A TENORM waste generator, aggregator, or TENORM waste management system may apply in writing and obtain the department's written approval that other proposed waste characterization methods are at least as protective of human health and the environment as the methods permitted under these requirements."

RESPONSE: The department agrees and has made this change.

Reviewed by:

DEPARTMENT OF ENVIRONMENTAL  
QUALITY

/s/ Angela Colamaria

Angela Colamaria  
Rule Reviewer

BY: /s/ Shaun McGrath

SHAUN McGRATH  
Director

Certified to the Secretary of State, June 16, 2020.