

The Texas Commission on Environmental Quality (TCEQ or commission) proposes an amendment to §290.108, Radionuclides Other than Radon.

#### BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE PROPOSED RULE

The primary purpose of the proposed amendment is to limit the level of uranium in water supplied by community water systems, in response to the United States Environmental Protection Agency (EPA) radionuclide drinking water regulations published in the December 7, 2000 issue of the *Federal Register* (65 FR 76708). The proposed amendment includes a maximum contaminant level (MCL) for uranium, which is not currently regulated under state law, and revisions to the monitoring requirements for combined radium-226 and radium-228, gross alpha particle radioactivity, and beta and photon radioactivity. This proposed amendment does not include, nor does it address, management of materials resulting from drinking water treatment processes. Implementation issues are being discussed with utilities that may need to treat their drinking water and manage the resulting materials. These issues will continue to be discussed until safe and cost-effective solutions are found.

The Safe Drinking Water Act, 42 United States Code, §300g-1(b)(10) calls for the effective date of a regulation to be three years after the date a rule is published. These radionuclide drinking water regulations become effective on December 7, 2003. A state may grant two additional years to a water system to comply with an MCL or a treatment technique if a state determines additional time is necessary for capital improvements. The Safe Drinking Water Act calls for this determination to be made on a system-by-system basis. 30 TAC §290.102 also contains this mechanism for additional time.

The Safe Drinking Water Act, 42 United States Code, §300g-2(a)(1) also requires that primacy states adopt an equivalent state rule within two years of federal rule adoption. However, the federal Safe Drinking Water Act does contain provisions which have allowed the commission to request a two-year extension to the adoption of the proposed amendment beyond the deadline of December 7, 2002. The commission requested an extension which EPA granted, thereby making the new deadline December 7, 2004. Pursuant to being granted the extension, the commission must implement the requirements of the new federal regulations, however, the commission has no legal basis to enforce any violations of the

regulations until it has adopted its own rules. Any violations identified by the commission would have to be enforced by EPA until the state rules are adopted.

An implementation issue concerning the proposed amendment involves the National Primary Drinking Water Regulations, 40 CFR §141.100, which covers criteria and procedures for public water systems using point-of-entry devices. The federal regulation sets limits on the use of point-of-entry devices.

First, public water systems may use point-of-entry devices to comply with MCLs only if they meet the requirements of this section.

Second, it is the responsibility of the public water system to operate and maintain the point-of-entry treatment system.

Third, the public water system must develop and obtain state approval for a monitoring plan before it may install point-of-entry devices for compliance. Under the plan approved by the state, point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all National Primary Drinking Water Regulations and would be of acceptable quality similar to water distributed by a well-operated central treatment plant.

Fourth, public water systems must apply effective technology under a plan approved by the state and maintain the microbiological safety of the water. In this regard, the state must require adequate certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices; and the design and application of the point-of-entry devices must consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary for public water systems to use frequent backwashing, post-contactor disinfection, and heterotrophic plate count monitoring to ensure that the microbiological safety of the water is not compromised.

Finally, the public water system shall protect all consumers of its system. Every building connected to the system must have a point-of-entry device installed, maintained, and adequately monitored. The

public water system must assure the state that every building is subject to treatment and monitoring, and that the rights and responsibilities of the public water system customer convey with title upon sale of property.

Utilization of point-of-use devices are covered specifically in the National Primary Drinking Water Regulations in the promulgation of the radionuclide rule. Two types of point-of-use devices have been identified as acceptable as small systems compliance technologies for radionuclides (40 CFR §141.66(h), Point-of-Use Ion Exchange and Point-of-Use Reverse Osmosis). However, when public water systems use point-of-use devices for compliance, they must provide programs for long-term operation, maintenance, and monitoring to ensure proper performance.

The regulations proposed today do not explicitly address point-of-use or point-of-entry as alternatives to centralized provision compliant water. However, because of affordability issues raised by the proposed amendment and possibly by future rules, it may be appropriate to formally consider point-of-use or point-of-entry alternatives at some point in the future. "Affordability" can have a different impact or meaning to public water systems across the state. Factors such as system size, source water, location, and ownership may pose a varied number of considerations.

Currently, the TCEQ addresses affordability issues with water systems through an enforcement tool called bilateral compliance agreements. Through these compliance agreements, water systems agree to provide feasibility studies which address the provision of compliant water for the entire water system. In many instances, these feasibility studies demonstrate that centralized provision of water which meets the standards is not economically feasible. When this occurs, public water systems may propose analysis of point-of-use or point-of-entry technologies. TCEQ analyzes, on a case-by-case basis, the validity of the technology and costs of these alternatives. The executive director may craft a new compliance agreement to ensure that the elements required in the National Primary Drinking Water Regulations are met before granting approval of such technologies.

## SECTION DISCUSSION

The commission proposes to amend §290.108(a) by deleting the second sentence and replacing it with a sentence that would require existing systems to comply with the requirements for uranium by January 1, 2004. These proposed revisions would make this section applicable to all community water systems to be consistent with the federal requirements contained in 40 Code of Federal Regulations (CFR) §141.66, and would remove distinctions in monitoring requirements for groundwater and surface water systems contained in 40 CFR §141.66(f) for uranium, which are no longer applicable.

The commission proposes to amend §290.108(b)(1) by adding the word “combined” and the phrase “and uranium” to be consistent with 40 CFR §141.66(e).

The commission proposes to amend §290.108(b)(1)(A) to specify that the MCL for radium-226 and radium-228 is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228, and to establish formatting for pico-Curies per liter (pCi/L). This proposed revision would make the section consistent with 40 CFR §141.66(b), in this regard.

The commission proposes to amend §290.108(b)(1)(B) by establishing the format for pCi/L and by adding the word “and” to link the three parts of the section, to be consistent with 40 CFR §141.66(c).

The commission proposes to add §290.108(b)(1)(C) to provide an MCL for uranium of 30 micrograms per liter ( $\mu\text{g}/\text{L}$ ), to be consistent with 40 CFR §141.66(e).

The commission proposes to amend §290.108(b)(2) by deleting the phrase “in community water systems are as follows:”; deleting §290.108(b)(2)(A) and (B); deleting Table A (Figure: 30 TAC §290.108(b)(2)(B)); and adopting by reference the MCL for beta and photon radioactivity from man-made radionuclides in drinking water contained in 40 CFR §141.66(d), as amended through December 7, 2000 (65 FR 76708), effective December 8, 2003.

The commission proposes to amend §290.108(c) by deleting the word “public” and replacing it with the word “community”; replacing the word “locations” with the phrase “the entry point(s) to the

distribution system”; and adding a reference to §290.102(e). These proposed changes provide consistency with federal requirements for community water systems contained in 40 CFR §141.26(a)(1), support an additional provision for entry point sampling contained in 40 CFR §141.26(i), and provide consistency in submission of agency scheduled samples as directed in §290.102(e).

The commission proposes to amend the monitoring requirements of §290.108(c)(1) to establish initial monitoring baselines as required in 40 CFR §141.26(a)(1). In the first sentence, the word “combined” is proposed to be added just prior to “radium-226 and radium-228” and the phrase “and uranium” is proposed to be added. The commission also proposes to delete the remaining existing language in this paragraph.

The commission proposes to amend §290.108(c)(1)(A) to provide for quarterly monitoring as specified in 40 CFR §141.26(c)(1). The following wording: “Quarterly monitoring. Requirements concerning quarterly monitoring are as follows” is proposed to be added and the existing language in this subparagraph is proposed to be deleted.

The commission proposes to add §290.108(c)(1)(A)(i) to incorporate the historical data requirements in 40 CFR §141.26(a)(2)(i).

The commission proposes to add §290.108(c)(1)(A)(ii) to implement the monitoring frequencies stipulated in 40 CFR §141.26(a)(2)(iv) and to incorporate the requirements for bilateral agreements contained in 40 CFR §141.26(a)(3)(v).

The commission proposes to add §290.108(c)(1)(A)(iii) to allow for the compositing of samples as stipulated in 40 CFR §141.26(a)(5).

The commission proposes to add §290.108(c)(1)(A)(iv) to incorporate the number of samples required for establishing historical data levels as required in 40 CFR §141.26(a)(2)(iv).

The commission proposes to amend §290.108(c)(1)(B) by incorporating requirements pertaining to reduced monitoring, to be consistent with 40 CFR §141.26(a)(3). The language “Reduced monitoring. Requirements concerning reduced monitoring are as follows” is proposed to be added and the existing language in this subparagraph is proposed to be deleted.

The commission proposes to add §290.108(c)(1)(B)(i) to incorporate requirements providing further direction on reduced monitoring, to be consistent with 40 CFR §141.26(a)(3)(i). A table, *Detection Limits for Radiological Contaminants* (Figure: 30 TAC §290.108(c)(1)(B)(i)) indicating minimum detection limits for each radionuclide is proposed to be consistent with 40 CFR §141.25(c)(1).

The commission proposes to add §290.108(c)(1)(B)(ii) - (v) to incorporate requirements providing further direction on reduced monitoring, to be consistent with 40 CFR §141.26(a)(3)(ii) - (iv) and (c)(1), respectively.

The commission proposes to amend §290.108(c)(1)(C) to authorize the use of historical data to meet initial monitoring requirements, as stipulated under 40 CFR §141.26(a)(2)(ii). The commission also proposes to delete the existing language in this subparagraph.

The commission proposes to add §290.108(c)(1)(C)(i) to authorize and direct the use of historical data of community water systems with one entry point to meet initial monitoring requirements, as stipulated under 40 CFR §141.26(a)(2)(ii)(A).

The commission proposes to add §290.108(c)(1)(C)(ii) to authorize and direct the use of historical data of community water systems with multiple entry points to meet initial monitoring requirements, as stipulated under 40 CFR §141.26(a)(2)(ii)(B).

The commission proposes to add §290.108(c)(1)(C)(iii) to authorize and direct the use of historical data of community water systems with distribution system results to meet initial monitoring requirements, as stipulated under 40 CFR §141.26(a)(2)(ii)(C).

The commission proposes to amend §290.108(c)(1)(D) to provide applicability and sampling location for new systems or sources, to be consistent with 40 CFR §141.26(a)(1)(ii). The commission also proposes to delete the existing language in this subparagraph.

The commission proposes to amend §290.108(c)(1)(E) to direct additional monitoring, to be consistent with 40 CFR §141.26(c)(1), and to allow for consistency with 40 CFR §141.66(b) in formatting pCi/L reference levels. The commission also proposes to delete the existing language in this subparagraph.

The commission proposes to add §290.108(c)(1)(F) to authorize the executive director to invalidate samples with obvious analytical errors to be consistent with 40 CFR §141.26(c)(4).

The commission proposes to add §290.108(c)(1)(G) to allow and provide direction on the substitution of gross alpha particle activity for required radium-226 and/or uranium, as provided for in 40 CFR §141.26(a)(5).

The commission proposes to add §290.108(c)(1)(G)(i) to provide direction on the substitution of gross alpha particle activity for required radium-226 analysis where the gross alpha particle activity result does not exceed 5 pCi/L, as provided for in 40 CFR §141.26(a)(5).

The commission proposes to add §290.108(c)(1)(G)(ii) to provide direction on the substitution of gross alpha particle activity for required uranium analysis where the result is less than 15 pCi/L, as provided for in 40 CFR §141.26(a)(5).

The commission proposes to add §290.108(c)(1)(G)(iii) to provide direction on the use of substituted gross alpha particle activity for required radium-226 or uranium analysis for compliance determination and future monitoring, to incorporate the requirements of 40 CFR §141.26(a)(5).

The commission proposes to add §290.108(c)(1)(G)(iv) to provide direction on the use of substituted gross alpha particle activity for required radium-226 or uranium analysis for compliance determination and future monitoring, to meet requirements in 40 CFR §141.26(a)(5).

The commission proposes to amend §290.108(c)(2) to adopt by reference the federal monitoring requirements for man-made radioactivity contained in 40 CFR §141.26(b), as amended through December 7, 2000 (65 FR 76708), effective December 8, 2003. The commission also proposes to delete the existing language in this paragraph.

The commission proposes to amend §290.108(d) by adding direction for compositing of samples to conform with 40 CFR §141.23(a)(4).

The commission proposes to amend §290.108(f)(1) by: including reference to running annual averages, for consistency with 40 CFR §141.26(c)(3)(i) and (iv); adding specification of MCL violations for combined radium-226 and radium-228 or uranium, for consistency with 40 CFR §141.66(b); and adding quarterly monitoring baseline requirements contained in 40 CFR §141.26(a)(2)(i). The commission also proposes to delete the remaining existing language in paragraph (1).

The commission proposes to amend §290.108(f)(1)(A) by: removing reference to radium-228 to no longer allow substitution of gross alpha particle activity for radium-228; including the formula for calculating substitution of gross alpha particle activity for radium-226; replacing “five” with “5”; and revising the format for pCi/L. Respectively, these changes are for: consistency with 40 CFR §141.66(b) in defining MCL for combined radium-226 and radium-228; consistency with 40 CFR §141.26(a)(5) in substitution of gross alpha particle activity for radium-226; consistency throughout the proposed amendment; and consistency with 40 CFR §141.66(b) in formatting pCi/L reference levels.

The commission proposes to amend §290.108(f)(1)(B) by: adding “measured” to gross alpha particle activity, for consistency with 40 CFR §141.66(b); formatting pCi/L reference levels; and removing a reference that allows substituting measured gross alpha particle activity for radium-228.

The commission proposes to add §290.108(f)(1)(C) to direct calculation of composited results in determining running annual averages as outlined in 40 CFR §141.26(c)(4).

The commission proposes to add §290.108(f)(1)(D) to direct sample results reported that are less than detection limit(s) in compliance calculation of running annual averages as outlined in 40 CFR §141.26(c)(3)(i).

The commission proposes to amend §290.108(f)(2) by making minor wording changes and deleting the second sentence to remove rule language that is no longer applicable.

The commission proposes to amend §290.108(f)(3) by deleting the word “public” and replacing it with the word “community” and adding the phrase “or to allow the executive director to conduct the monitoring.” These proposed changes provide consistency with federal requirements for community water systems contained in 40 CFR §141.26(a)(1) and in submission of agency scheduled samples as directed in §290.102(e).

The commission proposes to amend §290.108(f)(4) and (g) by deleting the word “public” and replacing it with the word “community,” for consistency with federal requirements for community water systems contained in 40 CFR §141.26(a)(1).

The commission proposes to amend §290.108(g)(1) by deleting the word “public” and replacing it with the word “community”; replacing “or total” with “combined”; and including “226 and radium-228, uranium.” This amendment provides consistency with federal requirements for community water systems contained in 40 CFR §141.26(a)(1) and with commission rule language formatting in §290.122(b).

The commission proposes to amend §290.108(g)(3) by deleting the word “public” and replacing it with the word “community,” for consistency with federal requirements for community water systems contained in 40 CFR §141.26(a)(1).

#### FISCAL NOTE

Jan Washburn, Analyst with Strategic Planning and Appropriations, has determined that for the first five-year period the proposed amendment is in effect, the commission expects no significant fiscal implications resulting from the implementation of the proposed amendment. However, there are fiscal implications anticipated which could be significant for certain community water systems and individuals served by them. These community water systems include those owned by units of state and local government, water supply corporations, and investor-owned utilities that have more than one entry point to their distribution systems. Additionally, those systems whose water would not meet the proposed MCLs of radionuclides may incur increased costs in order to comply with the new MCLs. Additional sampling requirements for community water systems with more than one entry point into their distribution systems in general are not anticipated to be significant. However, fiscal implications could be significant for those systems that must provide capital improvements to their systems or find alternate sources of water in order to comply with the proposed amendment.

The proposed amendment outlines MCLs for uranium in drinking water in accordance with EPA regulations. The proposed amendment would also provide revised monitoring requirements for radium, gross alpha radioactivity, and beta and photon radioactivity in water supplied by community water systems. The proposed amendment would require existing systems to comply with the new regulations by January 1, 2004. Although fiscal implications due to the revised monitoring requirements are realized, the implications for this cost may be reduced after the first five years as explained later and individuals served may not be affected by the revised monitoring requirements.

A community water system is a public water system which has the potential of serving at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis. There are an estimated 4,563 community water systems in the state. These proposed amendment would require community water systems to measure the level of radiochemicals at each entry point to the distribution system. Currently, radiological sampling requirements simply say community water systems must provide one sample per system, every four years. The proposed amendment would require one sample every three years from each entry point into the distribution system.

The costs attributable to the proposed amendment arises from two aspects. One is the ongoing cost of increased sampling requirements for radionuclides at the distribution entry points rather than the existing one sample per system. The other component pertains to corrective action that water systems must take when their water exceeds the MCLs.

#### *Sampling Costs*

There are an estimated 2,642 community water systems with more than one distribution entry point. Not all systems will need to sample water for radionuclides. If a community water system purchases water from another system that has already tested the purchased water, that purchased water does not need to be tested again. If a system satisfies the initial monitoring requirement through the use of historical data as described in the proposed amendment, the system may not be required to sample its water for radionuclides during the first five years the proposed amendment is in effect. While the frequency of sampling will be increased from once every four years to once in three years, this alone will not increase the cost for the purposes of this note, as these estimates are for five years. For those systems with only one entry point, there will be no increase in sampling costs. Average cost for this type of sample is \$168. After the initial monitoring cycle, the frequency of sampling can be reduced based on the results of the initial sampling. This will result in a reduced sampling cost per water system after the first five years the proposed amendment is in effect.

Systems that do not meet the MCLs will also be required to sample every entry point quarterly. Currently, systems that are out of compliance are required to sample quarterly, but at only one entry point, at a cost of \$287 for the group of four samples. For quarterly sampling, samples are collected four times a year, but sent to the lab only once a year, and analyzed simultaneously. These are more comprehensive tests; hence the cost difference between the annual and the quarterly samples. For systems with only one entry point, there will be no increase. For systems with two entry points, their cost will double. Systems with more than two entry points, for the purposes of this calculation, are assumed to have five entry points. These systems' quarterly sampling costs will be \$1148 more per year in addition to the \$287 they are currently spending. All costs calculated by the commission will be rounded off.

*Capital and Treatment Costs*

The second cost component is the expense of either treating the water for radionuclides or finding another water source. This cost could include both capital and operations and maintenance expenses. The capital costs associated with the proposed amendment include developing new sources of water (drilling wells), purchasing water from another source (laying pipe), and the capital cost of implementing appropriate treatment technologies such as reverse osmosis filtration systems or ion exchange filtration systems.

The commission staff and consultants gathered data on current radium-226, radium-228, gross alpha particle radioactivity, and uranium levels, allowing the commission to identify the systems likely to exceed the MCLs. From this data, the commission anticipates 41 systems will need to either make capital improvements to their facilities or purchase water from other sources. Of these 41 systems, four have already expended funds to make necessary changes, but these four systems anticipate additional expenditures to completely come into compliance. These estimates are included in this analysis. There are an additional six systems whose water does not meet the MCLs, but they have already made arrangements to purchase water from another source. Harris County has 16 systems whose wells do not meet the MCLs currently. However, the Harris County systems will be required to discontinue using these wells due to subsidence issues. Therefore, these systems are not included in these calculations.

The total costs to state and local governments for both of these components range from \$7 million to \$7.2 million. The cost to water supply corporations ranges from \$3.3 million to \$3.4 million. While for small or micro-businesses (investor-owned utilities), the total cost ranges from \$3.9 million to \$4.2 million.

## Costs to Local Governments

### *Sampling Cost*

State and local governments have 729 systems with one distribution system entry point and 617 water systems with more than one entry point. Systems with more than one entry point will experience increased costs. Of the 617 systems, there are seven state-owned systems, and approximately 610 systems are owned by cities, counties, or other units of government. The number of distribution entry points varies widely among these systems. Of the 617 systems, there are 309 systems with two entry points and 308 systems with more than two entry points. The average number of entry points for systems with more than two entry points is estimated to be five. The commission uses this average to approximate the number of entry points for those systems with more than two entry points. The average cost of a single radionuclide sample is estimated to be \$168. The average incremental cost for systems with two entry points, needing one more sample, is estimated to be the cost of one additional sample. The incremental cost per system, for systems with the average of five entry points, is estimated to be \$672. The commission estimates additional sampling costs for all state and local government community water systems in the first five years the proposed amendment is in effect to be \$260,000.

The proposed amendment would provide for quarterly monitoring of systems where the average of the initial monitoring results is above the MCL. It is anticipated that 6% of the 610 community water systems with multiple entry points owned by local governments, or 36, will be required to sample quarterly. For these systems, 19 are estimated to have two entry points while 17 are estimated to have five entry points. At \$287 per sample, costs for quarterly monitoring are estimated at \$125,000 for the first five years the proposed amendment is in effect. Only one state government system is estimated to require quarterly sampling for a system with an estimated three entry points, for a total cost of \$2,870. For quarterly sampling, samples are collected four times a year, but sent to the lab only once a year, and analyzed simultaneously. These are more comprehensive tests; hence the cost difference between the average cost of a single radionuclide sample and the quarterly samples. Total costs for community water systems owned by state and local governments to implement the proposed amendment for both multiple entry points and quarterly sampling are estimated to be \$390,000 for five years.

### *Capital and Operating Costs*

The commission estimates that there are nine local government water systems that may need to make capital improvements to their systems or incur additional operational and maintenance expenses in order to comply with the proposed MCLs for radionuclides in drinking water. The agency recently surveyed these systems to determine how they would comply with the proposed amendment. Options available to systems to comply with the proposed amendment include developing new sources of water, purchasing water from another source, and implementing appropriate treatment techniques such as reverse osmosis filtration systems or ion exchange filtration systems.

Three local government systems reported estimated total costs for developing new sources of water or drilling new wells at \$2.8 million. Three other systems reported estimated costs of \$3 million to purchase water supplies. One system reported estimated costs to implement a reverse osmosis filtration system of \$106,518. Another system reported plans to implement an ion exchange water filtration system at a cost of \$218,078. These systems also reported operations and maintenance costs to purchase water or to treat water, whichever was applicable, and one system reported only increased operational and maintenance expenses. The estimated costs ranged from \$114,000 per year to \$136,000 per year or from \$570,000 to \$680,000 for five years. Local governments costs for capital improvements to comply with the proposed amendment totals \$6.2 million. The total estimated cost to local governments for capital and related ongoing expenses ranges from \$6.7 million to \$6.8 million. Adding in sampling costs, the total cost to state and local governments is estimated to range from \$7.1 million to \$7.2 million for the first five years the proposed amendment is in effect.

### **PUBLIC BENEFITS AND COSTS**

Ms. Washburn has determined that for each year of the first five years the proposed amendment is in effect, the public benefit anticipated from the enforcement of and compliance with the proposed amendment would be compliance with federal law and the protection of the health of those exposed to radionuclides in drinking water. It is anticipated that the public health benefit would be a decrease in the exposure to potential cancer-causing agents in drinking water.

Water Supply Corporations

### *Sampling Costs*

Water supply corporations own 286 systems with more than one distribution entry point. There are 147 systems with two entry points, and 139 systems with more than two. For these 139 systems, it is estimated their average number of entry points is five. The incremental cost of a radionuclide sample for systems with two distribution entry points is \$168, and the average incremental cost for systems estimated to have five entry points is \$672. The commission estimates additional sampling costs for water supply corporations in the first five years the proposed amendment is in effect to be \$119,000.

The proposed amendment would require quarterly monitoring of systems where the average of the initial monitoring results is above the MCLs. It is anticipated that 6% of the water supply corporations with more than one entry point, will need to sample quarterly, or 17 systems. Of these systems, nine are estimated to have two entry points and eight are estimated to have five entry points. At \$287 per sample, costs for quarterly sampling are estimated to be \$59,000. Total estimated costs to water supply corporations to implement the proposed amendment related to sampling of multiple entry points and quarterly monitoring are estimated to be \$180,000, for five years.

### *Capital and Ongoing Costs*

The commission estimates there are seven water supply corporations that may need to either make capital improvements to their systems or find a new source of water in order to comply with the proposed MCLs for radionuclides in drinking water. Four water supply corporations reported estimated total costs for developing new sources, for example, drilling new wells or enhancing existing sources, of \$3 million. One system reported estimated a one-time cost of \$2,075 to purchase water. No system reported plans to implement either a reverse osmosis filtration system or an ion exchange water filtration system. Three systems also reported ongoing costs to purchase water ranging from \$10,256 to \$27,256 per year.

For the seven water supply corporations that may not meet the MCL levels, estimated costs to comply with the proposed amendment through capital improvements total \$3 million. The total cost to water supply corporations for sampling, capital and ongoing expenses ranges from \$3.3 million to \$3.4 million for the first five years that the proposed amendment is in effect.

## SMALL BUSINESS AND MICRO-BUSINESS ASSESSMENT

There are adverse fiscal implications anticipated as a result of the implementation and enforcement of the proposed amendment for small and micro-businesses that own or operate community water systems. For the purposes of this fiscal note, a community water system with 1,700 connections or fewer is considered a small business, assuming an average of \$50 per month per connection in revenue to the water system. All of the 25 investor-owned systems are considered small or micro-businesses.

### Investor-owned Systems

#### *Sampling Costs*

There are an estimated 324 community water systems owned by investor-owned utilities with more than one distribution entry point. Of these systems, 243 have two entry points, and 81 have an estimated average of five entry points per system. The average cost of a radionuclide sample is estimated to be \$168. Additional sampling costs for investor-owned community water systems with more than one entry point are estimated to be \$96,000.

The proposed amendment would require quarterly monitoring for systems where the average of the initial monitoring results is above the MCL. It is anticipated that 6% or 20 systems of the investor-owned water systems with more than one entry point will be required to sample quarterly. Of these, it was estimated 15 had two entry points and five were estimated to have an average of five entry points. At \$287 per sample, costs for quarterly monitoring are estimated to be \$50,000. Total estimated costs to investor-owned community water systems to implement the proposed sampling of multiple entry points and quarterly samples are estimated to be \$146,000.

#### *Capital and Operating Costs*

Ten investor-owned systems reported estimated total costs for developing new sources of water at \$707,200. Eight systems reported estimated costs of \$668,500 to drill new wells. Four systems reported that they were planning to implement reverse osmosis filtration systems at an estimated cost of \$524,329. One investor-owned system reported that it was planning to implement an ion exchange water filtration system for \$46,343 with operation and maintenance costs of \$5,243 per year. Two systems reported only increased operational maintenance expenses. Investor-owned systems reported

estimated total costs for capital and developing new sources of water at \$1.9 million. Operation and maintenance costs were reported to range from \$366,000 to \$427,000 per year, or from \$1.8 million to \$2.1 million for five years. Costs to comply with the proposed amendment is estimated to range from \$3.7 million to \$4 million. With sampling costs included, total cost to investor-owned systems are estimated to range from \$3.9 million to \$4.2 million for the first five years the proposed amendment is in effect.

#### LOCAL EMPLOYMENT IMPACT STATEMENT

The commission has reviewed this proposed rulemaking and determined that a local employment impact statement is not required because the proposed amendment does not adversely affect a local economy in a material way for the first five years that the proposed amendment is in effect.

#### DRAFT REGULATORY IMPACT ANALYSIS DETERMINATION

The commission reviewed the proposed rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and determined that the rulemaking does not meet the definition of a “major environmental rule” as defined in that statute. A “major environmental rule” means a rule, the specific intent of which, is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The proposed amendment to Chapter 290 is intended to protect the environment or reduce risks to human health from exposure to certain radionuclides emanating from naturally occurring radioactive material in excess of federal health standards in community drinking water systems and could materially affect certain systems. However, the proposed amendment to Chapter 290 would not affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state because it would apply only to a limited number of water systems.

Furthermore, the proposed rulemaking does not meet any of the four applicability requirements listed in Texas Government Code, §2001.0225(a). This section only applies to a major environmental rule, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by

state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law. This rulemaking does not meet any of these four applicability requirements because this rulemaking: 1) does not exceed any standard set by federal law for acceptable exposure levels of naturally occurring radioactive material in public drinking water systems and is proposed to be consistent with federal rules; 2) does not exceed the requirements of state law under Texas Health and Safety Code, Chapter 341, Subchapter C; 3) does not exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement any state and federal program on radionuclides in public drinking water systems, but rather is proposed to be consistent with federal rules in order to allow the state to maintain its authority to implement the federal Safe Drinking Water Act; and 4) is not proposed solely under the general powers of the agency, but rather specifically under Texas Health and Safety Code, §341.031, which allows the commission to adopt and enforce rules to implement the federal Safe Drinking Water Act, as well as the other general powers of the agency.

The commission invites public comment on the draft regulatory impact analysis determination.

#### TAKINGS IMPACT ASSESSMENT

The commission evaluated the proposed amendment and performed a preliminary assessment of whether it constitutes a takings under Texas Government Code, Chapter 2007. The purpose of the proposed amendment is to limit the level of uranium in water supplied by community water systems, in response to the EPA radionuclide drinking water regulations published in the December 7, 2000 issue of the *Federal Register* (65 FR 76708). The proposed amendment would substantially advance this stated purpose by adopting an MCL for uranium, which is not currently regulated, and revising the monitoring requirements for combined radium-226 and radium-228, gross alpha particle radioactivity, and beta and photon radioactivity.

Publication and enforcement of the proposed amendment would not affect private real property, which is the subject of the rule primarily because it amends and expands existing drinking water standards to authorize regulation of radionuclides. The proposed amendment is not anticipated to affect private real property because it does not restrict or limit an owner's right to the property that would otherwise exist in the absence of this proposed rulemaking. The rulemaking simply requires community water systems to comply with drinking water standards protective of human health and the environment.

Furthermore, the proposed rulemaking would make state standards for radionuclides consistent with existing federal standards. Therefore, the proposed amendment does not constitute a takings under Texas Government Code, Chapter 2007.

#### CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

The commission has reviewed this rulemaking and found that the proposal is not a rulemaking subject to the Texas Coastal Management Program (CMP) because the rulemaking is neither identified in the Coastal Coordination Act Implementation rules, 31 TAC §505.11, nor will it affect any action or authorization identified in §505.11. Therefore, the proposal is not subject to the CMP. The purpose of this proposed amendment is to bring community water systems into compliance with certain requirements concerning radiological contaminants. The rulemaking does not govern air pollutant emissions, on-site sewage disposal systems, or underground storage tanks which would make it subject to the CMP under §505.11(b)(2). The rulemaking also does not govern or authorize actions listed in §505.11(a)(6).

#### ANNOUNCEMENT OF HEARING

A public hearing on this proposal will be held in Austin on September 4, 2003 at 10:00 a.m. at the TCEQ complex, Building F, Room 2210, located at 12100 Park 35 Circle. The hearing will be structured for the receipt of oral or written comments by interested persons. Individuals may present oral statements when called upon in order of registration. There will be no open discussion during the hearing; however, an agency staff member will be available to discuss the proposal 30 minutes prior to the hearing and will answer questions before and after the hearing.

Persons with disabilities who have special communication or other accommodation needs who are planning to attend the hearing should contact the Office of Environmental Policy, Analysis, and Assessment at (512) 239-4900. Requests should be made as far in advance as possible.

#### SUBMITTAL OF COMMENTS

Comments may be submitted to Patricia Durón, Office of Environmental Policy, Analysis, and Assessment, MC 205, P.O. Box 13087, Austin, Texas 78711-3087 or faxed to (512) 239-4808. All comments should reference Rule Log Number 2001-022-290-WT. Comments must be received by 5:00 p.m., September 8, 2003. For further information or questions concerning this proposal, please contact Ray Henry Austin, Policy and Regulations Division, (512) 239-6814.

**SUBCHAPTER F: DRINKING WATER STANDARDS GOVERNING  
DRINKING WATER QUALITY AND REPORTING REQUIREMENTS  
FOR PUBLIC WATER SYSTEMS**

**§290.108**

**STATUTORY AUTHORITY**

The amendment is proposed under Texas Water Code, §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; §5.103, which establishes the commission's general authority to adopt rules; §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300 *et seq.*

The proposed amendment implements Texas Health and Safety Code, §341.031 and §341.0315, which require public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

**§290.108. Radionuclides Other than Radon.**

(a) Applicability. All community water systems shall comply with the requirements of this section regarding radiological contaminants. Existing systems shall comply with the requirements for uranium by January 1, 2004. [Public water systems treating groundwater under the direct influence of surface water must comply with the radiological requirements for surface water systems.]

(b) Maximum contaminant levels (MCLs). The concentration of radiological contaminants in the water entering the distribution system shall not exceed the following MCLs [maximum contaminant levels].

(1) MCLs for combined radium-226[,] and radium-228, [and] gross alpha particle radioactivity, and uranium for community systems are as follows:

(A) the MCL for combined radium-226 and radium-228 is 5 pico-Curies per liter (pCi/L), determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228; [pCi/l; and]

(B) the MCL for gross alpha particle activity (including radium-226, but excluding radon and uranium) is 15 pCi/L; and [pCi/l.]

(C) the MCL for uranium is 30  $\mu\text{g/L}$ .

(2) The commission adopts by reference the MCLs [Maximum contaminant levels] for beta particle and photon radioactivity from man-made radionuclides in drinking water contained in Title 40 Code of Federal Regulations §141.66(d), as amended through December 7, 2000 (65 FR 76708), effective December 8, 2003. [in community water systems are as follows:]

[(A) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem (mrem)/year.]

[(B) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing four mrem total body or organ dose equivalents shall be calculated on the basis of a two-liter-per-day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year.]

**[Figure: 30 TAC §290.108(b)(2)(B)]**

(c) Monitoring requirements. Community [Public] water systems shall measure the concentration of radiochemicals at the entry point(s) to the distribution system [locations] and

frequencies specified in the system's monitoring plan. All samples must be collected during normal operating conditions. Samples must be submitted in accordance with §290.102(e) of this title (relating to General Applicability).

(1) The monitoring frequency requirements for gross alpha particle activity, combined radium-226 and radium-228, and uranium are as follows. [Public water systems shall monitor at least once every four years following the procedure required by subsection (f)(1) of this section. At the discretion of the executive director, when an annual record taken in conformance with subsection (f)(1) of this section has established that the average annual concentration is less than one-half the maximum contaminant levels established by subsection (b) of this section, analysis of a single sample may be substituted for the quarterly sampling procedure required by subsection (f)(1) of this section.]

(A) Quarterly monitoring. Requirements concerning quarterly monitoring are as follows. [More frequent monitoring shall be conducted when required by the executive director in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water, or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in the finished water.]

(i) In the absence of historical data, as described in subparagraph (C) of this paragraph, community water systems shall complete one year of quarterly monitoring.

(ii) If the average of the initial monitoring results is above the MCL, the community water system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the executive director.

(iii) To fulfill quarterly monitoring requirements, a community water system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample.

(iv) If grab samples are used for quarterly monitoring, the executive director may waive the final two quarters of initial monitoring for an entry point if the results of the samples from the previous two quarters are below the detection limit.

(B) Reduced monitoring. Requirements concerning reduced monitoring are as follows. [A public water system shall monitor in conformance with subsection (c)(1)(A) of this section within one year of the introduction of a new water source for a community water system.]

(i) If the average of the initial monitoring results for each contaminant (gross alpha particle activity, uranium, and combined radium-226 and radium-228) is below the detection limit specified in the following table, the community water system must collect and analyze for that contaminant using at least one sample at that entry point every nine years.

Figure: 30 TAC §290.108(c)(1)(B)(i)

**Table A: Detection Limits for Radiological Contaminants**

<b>Contaminant</b>	<b>Detection limit</b>
Gross alpha particle activity	3 pCi/L
Radium-226	1 pCi/L
Radium-228	1 pCi/L
Uranium	Reserved

(ii) If the average of the initial monitoring results for a contaminant is at or above the detection limit, but at or below 0.5 times the MCL, the community water system must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

(iii) If the average of the initial monitoring results for a contaminant is above 0.5 times the MCL but at or below the MCL, the community water system must collect and analyze at least one sample at that sampling point every three years.

(iv) If the average of quarterly monitoring results for a contaminant is greater than the MCL, the monitoring frequency at that entry point may not be reduced.

(v) The results of samples collected during a reduced monitoring period will be used to determine the monitoring frequency for subsequent monitoring periods.

(C) Historical data. Community water systems must conduct initial monitoring to determine compliance with subsection (b)(1)(A) - (C) of this section, by December 31, 2007. [A community water system using two or more sources having different concentrations of radioactivity shall monitor the source of water, in addition to water from a free-flowing tap, when required by the executive director.]

(i) To satisfy initial monitoring requirements, a community water system having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(ii) To satisfy initial monitoring requirements, a community water system with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(iii) To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the executive director finds that the historical data satisfactorily demonstrates that each entry point to the distribution system is expected to be in compliance based upon

the historical data and reasonable assumptions about the variability of contaminant levels between entry points.

(D) New sources. All new community water systems or community water systems that use a new source of water must begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. [Monitoring for compliance with subsection (b) of this section after the initial period need not include radium-228 provided that the average concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by this subsection.]

(E) Additional monitoring. The executive director may require more frequent monitoring or may require confirmation samples at the executive director's discretion. [Public water systems shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds three pCi/l when required by the executive director.]

(F) Invalidation of results. The executive director may invalidate the results of obvious sampling or analytic errors.

(G) Substitution of data. Gross alpha particle activity may be substituted for radium-226 or uranium activity, as follows.

(i) The results of a gross alpha particle activity analysis may be used to represent radium-226 activity, if the measured gross alpha particle activity does not exceed 5 pCi/L, within a 95% confidence interval (1.65 sigma, where sigma is the standard deviation of the net counting rate of the sample).

(ii) The results of a gross alpha particle activity analysis may be used to represent uranium activity, if the measured gross alpha particle activity does not exceed 15 pCi/L, within a 95% confidence interval (1.65 sigma, where sigma is the standard deviation of the net counting rate of the sample).

(iii) When a gross alpha particle activity measurement is used in lieu of a radium-226 and/or uranium measurement, the reported gross alpha particle activity analytical result will be used to determine compliance and future monitoring frequency for radium-226 or uranium.

(iv) When a gross alpha particle activity measurement is less than detection, one-half of the detection limit will be used to determine compliance and the future monitoring frequency for radium-226 or uranium.

(2) The commission adopts by reference the monitoring requirements for man-made radioactivity contained in 40 Code of Federal Regulations §141.26(b), as amended in the *Federal Register* through December 7, 2000 (65 FR 76708), effective December 8, 2003. [The monitoring frequency requirements for man-made radioactivity in community water systems are as follows:]

[(A) Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the executive director shall be monitored for compliance with the subsection (b) of this section by analysis of four quarterly samples. Compliance with subsection (b) of this section may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A of subsection (b)(2)(B) of this section, provided that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed four mrem/year.]

[(i) If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.]

[(ii) Public water systems shall conduct additional monitoring as required by the executive director to determine the concentration of man-made radioactivity in principal watersheds designated by the executive director.]

[(iii) At the discretion of the executive director, public water systems utilizing only groundwater may be required to monitor for man-made radioactivity.]

[(B) After the initial analysis required by subsection (c)(2)(A) of this section, public water systems shall monitor at least every four years following the procedure given in subsection (c)(2)(A) of this section.]

[(C) A community water system designated by the executive director as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.]

[(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.]

[(ii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. When iodine-131 is identified in the finished water more frequent monitoring shall be conducted as required by the executive director.]

[(iii) Annual monitoring for strontium-90 and tritium shall be conducted by the analysis of four quarterly samples.]

[(iv) The executive director may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the public water system where the executive director determines such data is applicable to a particular community water system.]

(3) (No change.)

(d) Analytical requirements for radiological contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for radiological contaminants shall be performed at a laboratory certified by the executive director. Compositing shall be performed consistent with 40 Code of Federal Regulations §141.23(a)(4), Inorganic Chemical Sampling and Analytical Requirements.

(e) Reporting requirements. Upon the request of the executive director, the owner or operator of a community [public] water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within ten days of the request or within ten days of their receipt by the community [public] water system, whichever is later. The copies must be mailed to the Texas Commission on Environmental Quality [Texas Natural Resource Conservation Commission], Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

(1) If the running annual average [annual MCL] for gross alpha particle activity, combined radium-226 and radium-228, or uranium [or total radium as set forth] in subsection (b) of this section is exceeded, based on quarterly monitoring results, the system has committed an [a] MCL violation. [Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective. Compliance with subsection (b) of this section shall be based on the analysis or analyses of four quarterly samples.]

(A) A gross alpha particle activity measurement may be substituted for the required radium-226 [and radium-228] analysis provided that the measured gross alpha particle activity plus the measured radium-228 particle activity does not exceed 5 pCi/L [five pCi/l] at a confidence

level of 95% (1.65 sigma [theta] where sigma [theta] is the standard deviation of the net counting rate of the sample).

(B) When the measured gross alpha particle activity plus measured radium-228 particle activity exceeds 5 pCi/L [five pCi/l], the same or an equivalent sample shall be analyzed for radium-226. [If the concentration of radium-226 exceeds three pCi/l, the same or an equivalent sample shall be analyzed for radium-228.]

(C) The analytical results from a composite sample will be treated as the annual average to determine compliance with the MCLs and the future monitoring frequency.

(D) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one-half the detection limit will be used to calculate the annual average.

(2) If the average annual MCL [maximum contaminant level] for man-made radioactivity set forth in subsection (b) of this section is exceeded, the system has committed an [a] MCL violation. [Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.]

(3) A community [public] water system that fails to conduct the monitoring tests, or to allow the executive director to conduct the monitoring, required by this section [subsection] commits a monitoring violation.

(4) A community [public] water system that fails to report the results of the monitoring tests required by this section [subsection] commits a reporting violation.

(g) Public notification. A community [public] water system that violates the requirements of this section [subsection] must notify the executive director and the system's customers.

(1) A community [public] water system that violates the MCL for gross alpha particle activity, combined radium-226 and radium-228, or uranium [or total radium] shall give notice to the executive director and notify the public as required by §290.122(b) of this title (relating to Public Notification).

(2) (No change.)

(3) A community [public] water system which fails to conduct the monitoring required by this section [subsection] must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.