

BACKGROUND ON EPA'S 2000 DRINKING WATER REGULATIONS FOR RADIONUCLIDES

EPA's Regulation of Drinking Water Authority

The U.S. Environmental Protection Agency (EPA) sets national health-based standards for drinking water to protect against both naturally occurring and man made contaminants that may be found in drinking water. EPA's authority to set these standards stems from the Safe Drinking Water Act (SDWA) of 1974, as amended. Unlike many other legislative actions, such as the Clean Water Act, the SDWA does not distinguish Atomic Energy Act (AEA) material from other radioactive material.

EPA sets two types of primary drinking water limits for each regulated contaminant: a Maximum Contaminant Level Goal (MCLG) and a Maximum Contaminant Level (MCL). A MCLG is conservatively established at a level where there is no known or expected health effect. Because EPA uses a non-threshold linear risk model for ionizing radiation, all MCLGs for radionuclides are set at zero. MCLs are set as close to the MCLGs as possible, after consideration of cost and technological feasibility. Unlike the MCLG, the MCL is an enforceable standard.

In addition to the contaminant levels, EPA sets monitoring, testing, reporting, and enforcement requirements for each contaminant. Reporting and public notification requirements are tiered in proportion to the severity of the violation, and use standardized language. Most direct implementation and oversight of the SDWA programs is carried out at the State level. State enforcement is authorized through a "primacy agreement" between the EPA and the States, somewhat similar to the NRC's relationship with the Agreement States.

Federal Radionuclide Drinking Water Limits, 1976 - 2000

In 1976, drinking water regulations were first established for radioactivity (gross alpha, beta, and photon) and combined radium (radium-226 and radium-228). Because alpha emitters were regulated as a whole, uranium was not selectively removed from drinking water. Therefore, NRC's regulatory program was not impacted by EPA's drinking water regulations at that time.

Congress required EPA to promulgate standards specifically for uranium through its 1986 re-authorization of the SDWA. Uranium was to be considered separately from the other alpha emitters for the first time, due in part to its chemical toxicity. In 1991, EPA proposed an MCLG and an MCL of 0 micrograms per liter ($\mu\text{g}/\text{L}$) and 20 $\mu\text{g}/\text{L}$, respectively, for uranium (56 FR 33050); however, the 1991 proposed rule was never finalized.

Subsequent to 1996 amendments to the SDWA, EPA was sued for failure to finalize the radionuclides rule. EPA entered into a court stipulated agreement to take final action for uranium within four years. On December 7, 2000, the EPA finalized its National Primary Drinking Water Regulations for Radionuclides (2000 Radionuclides Rule) [65 FR 76708]. The rule established an MCL of 30 $\mu\text{g}/\text{L}$ for uranium.

The 2000 Radionuclides Rule: Methodology

The main reason that the 1991 and 2000 uranium MCLs differ is due to a methodology change. In 1991, EPA was required by statute to set the MCL as close to the MCLG as is feasible. The 1996 SDWA amendments provided new discretionary authority for the EPA Administrator to set

an MCL that is less stringent than the feasible level if the benefits of an MCL set at the feasible level would not justify the costs.

In 1991 EPA determined that uranium can be feasibly treated at a level of 20 µg/L, and therefore the MCL was proposed at that concentration. The 2000 Radionuclides Rule reaffirmed that 20 µg/L is the feasible level. However, because the EPA Administrator was allowed to consider cost-benefit analysis, EPA determined that an MCL of 30 µg/L maximizes the health risk reduction benefits at a cost justified by the benefits.

The 2000 Radionuclides Rule: Implementation

Because uranium, as an individual contaminant, had not been widely measured in drinking water systems prior to the 2000 Radionuclides Rule, EPA is phasing in the new requirement. The rule was not made effective until 2003, to allow for the development of effective testing techniques and to build lab capacity. In addition, only community water systems, which are water systems that serve at least 15 service connections or 25 residents regularly year round, are required to meet the final MCL and have monitoring and reporting requirements.

The facilities, as directed by the States, are allowed up to four years to complete four consecutive quarters of initial monitoring. After the initial monitoring phase is complete – by December 31, 2007 – the States and EPA will institute 9-year compliance cycles, during which drinking water systems will treat and periodically monitor for uranium; the monitoring period will depend upon the level of uranium detected in the water.

If the monitoring reveals uranium exceeding the MCL at any time, the facility must notify the public within 30 days and develop a compliance schedule to be approved by the State. The Federally-required public notification for a uranium violation is: “Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.” Methods for compliance include blending the uranium-laden water with an uncontaminated water source, substituting an alternative source of water, or installing a physio-chemical process to remove the uranium from the drinking water.

The 2000 Radionuclides Rule also makes allowance for a facility to extend the time until its compliance by using EPA’s Variance and Exemption Rule (63 FR 19442; April 20, 1998). The Variance and Exemption Rule essentially allows small systems who find the new regulation burdensome to petition the EPA for an extension of the monitoring phase. Extensions are granted in three-year increments, up to a total of nine years at the discretion of the primacy agency and the drinking water system. As of the NRC staff’s last discussion of this provision with EPA’s Office of Water and Groundwater (November 2005), no drinking water systems had requested an extension for uranium. The majority of affected facilities are likely to meet the eligibility requirements to qualify for an extension; however, due to the complicated exemption process and public perception, it is unlikely that a significant number of the affected facilities will use the exemption to delay removing uranium from drinking water. Effectively, this means that impacted facilities will gradually begin addressing their uranium contamination through December 2007.