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Regulating Lead in Drinking Water: Issues and Developments

Introduction

The Safe Drinking Water Act (SDWA) authorizes the U.S. Environmental Protection Agency (EPA) to regulate contaminants in public water supplies. EPA regulates lead specifically through the 1991 Lead and Copper Rule (LCR; 40 C.F.R. Part 141 Subpart I). In the wake of detections of elevated lead levels in tap water in Flint, Michigan, and elsewhere, questions emerged regarding (1) the adequacy of SDWA authorities, and (2) the effectiveness of the LCR in limiting lead exposures and protecting public health.

Regulatory issues associated with the LCR include (1) monitoring protocols, (2) public notification and reporting requirements, (3) corrosion control to prevent lead in plumbing materials from leaching into water, (4) lead service line (LSL) replacement practices and costs, and (5) overall implementation and enforcement of the rule. EPA is working to update the LCR to address these and other issues and respond to scientific and technological advancements—including improved corrosion control practices and improved understanding of the health effects of low-level lead exposures. The agency announced plans to propose comprehensive revisions in August 2018.

Broader SDWA issues concern (1) the adequacy of state agency resources to oversee the nation's 151,000 public water systems and ensure compliance with EPA rules, (2) the financial and technical capacity of systems—particularly smaller and lower-income communities—to comply with SDWA requirements, and (3) funding needed to upgrade and replace aging drinking water infrastructure.

SDWA Implementation

Implementation of the LCR emerged as an issue in Flint and raised questions regarding federal and state roles under the SDWA. Generally, the act is administered jointly by EPA and the states. Among other duties, EPA promulgates national primary drinking water regulations (NPDWRs) that establish standards or treatment techniques to control drinking water contaminants. Public water systems, both publicly and privately owned, must comply with the regulations (SDWA §1412; 42 U.S.C. §300g-1).

States generally have primary responsibility (“primacy”) for enforcement and oversight of public water systems and administration of the Public Water System Supervision (PWSS) program (SDWA §1413; 42 U.S.C. §300g-2). Primacy states or tribes adopt and enforce regulations at least as stringent as EPA rules, provide technical assistance to public water systems, conduct inspections of systems, maintain records and compliance data, report to EPA, etc. All states (except Wyoming and the District of Columbia) and territories and Navajo Nation have primacy. EPA directly oversees public water systems in non-primacy areas and retains oversight of primacy states.

State Funding

States receive annual grants from EPA to defray some PWSS program administration costs. (SDWA §1443(a); 42 U.S.C. §300j-2(a)). The grants are used primarily to pay agency salaries. States have sought more funding, noting an annual funding gap of more than \$300 million, the growing complexity of SDWA requirements, and the challenges of assisting numerous (mostly small) water systems. Congress appropriated \$101.8 million for PWSS grants for FY2017. The President requested \$71.2 million for FY2018.

Lead and Copper Rule

The 1991 LCR (56 *Federal Register* 26460) is intended to protect public health by limiting levels of these metals in drinking water, primarily by reducing water corrosivity. This rule replaced a lead standard of 50 micrograms per liter (µg/L, or parts per billion) that was measured at the water utility but not at the tap. The LCR does not include a health-based standard (i.e., maximum contaminant level [MCL]) as is often the case for NPWDRs. Instead, the rule established a treatment technique that includes (1) corrosion control treatment, (2) source water treatment, (3) LSL replacement, and (4) public education. When developing the rule, EPA determined that using an MCL at the tap (or treatment plant) was not feasible, as lead levels are often influenced by factors beyond the control of the water utility.

As with other SDWA regulations, federal, state, and often local levels of government have responsibilities and roles under the LCR. The role of public water systems (most are publicly owned) broadly includes tap water monitoring, reporting to the state, corrosion treatment, water quality parameter monitoring, public notification, and lead service line replacement (as needed). Further, water system operators must deliver annual water quality compliance reports to customers that include lead education information. The state's role broadly includes providing technical assistance, setting water quality parameter monitoring requirements, overseeing each water system's corrosion control treatment and LCR compliance, and reporting to EPA. EPA provides technical assistance and regulatory guidance to system operators and states, oversees state implementation of the rule, and retains ultimate enforcement responsibilities.

The LCR includes an “action level” of 15 ppb for lead (and 1,300 ppb for copper), based on the 90th percentile level of tap water samples. Unlike an MCL, an action level is not a health-based standard but, rather, a screening tool for determining whether treatment technique actions are required. The lead action level is based on the practical feasibility of reducing lead through controlling corrosion. An exceedance of the action level is not a violation of the rule but can trigger other requirements. A water system violates the LCR if it does not take the triggered actions.

Public Water System Requirements

The LCR generally requires water system operators to obtain results from properly sampled taps at homes or buildings at high risk of lead contamination (i.e., with known LSLs or lead plumbing) if sufficient sites can be identified (40 C.F.R. 141.86(b)). Sampling results must be provided to water users at tested sites. If more than 10% of samples collected during a monitoring period exceed the action level, a water system must take specified actions that depend upon the system's size and corrosion control treatment status. These actions are outlined briefly below.

- Water systems serving fewer than 50,000 persons are considered to have optimal corrosion control if their 90th percentile sample level is below the action level. If monitoring results indicate the 90th percentile for lead (or copper) to be above the action level, such water systems must undertake:
 - Water quality parameter monitoring,
 - Corrosion control treatment optimization, and
 - Source water monitoring.
- Water systems serving 50,000 or more people are required to maintain optimized corrosion control (as compared to smaller systems that are initially deemed to have corrosion control). If these systems (or smaller systems that have already optimized corrosion control treatment) exceed the action level, then the following actions are required:
 - Public education, and
 - Lead service line replacement.

The LCR requires systems that have installed corrosion control treatment to continue to maintain corrosion control treatment and meet water quality parameters set by the state. Failure to meet these water quality parameters is a violation of the rule. The LCR also requires that, if a system plans to change the *source* or *treatment* of its water, the water supplier must notify the state in advance to evaluate the impact of the proposed change on corrosion control.

Maintaining corrosion control to limit lead from leaching into drinking water from water distribution system components and premise plumbing is a complex task—made more complex by changes in water chemistry, newer NPDWRs, and other factors. The American Water Works Association (AWWA), representing drinking water utilities and professionals, notes, “Since the promulgation of the Lead and Copper Rule, and the initial optimization of corrosion control, systems have faced the ongoing challenge of continuing to maintain optimal corrosion control while making necessary adjustments to treatment processes or system operations unrelated to corrosion control to comply with other NPDWRs. Determining whether treatment is optimized can be challenging.” (See AWWA, *Optimized Corrosion Control Treatment Primer*.)

LCR Review and Revision

Given advancements in health research, water treatment, and corrosion management, EPA has been working with advisors and stakeholders to revise the rule. In 2004, EPA initiated an extensive review of the LCR after increases in lead levels were widely detected in District of Columbia tap water following a change in water treatment. In 2007, EPA

issued short-term clarifications and revisions to the LCR. The agency plans to promulgate comprehensive Long Term Revisions to the LCR (LTR LCR) in early 2020.

NDWAC LCR Working Group Recommendations

In December 2015, EPA's National Drinking Water Advisory Council (NDWAC) approved its working group's extensive set of recommendations for the LTR LCR and presented them to EPA (*Report of the Lead and Copper Rule Working Group to the National Drinking Water Advisory Council*). Among other recommendations, the NDWAC urged EPA to revise the rule to (1) establish a proactive LSL replacement program and encourage water systems to include such costs in their capital improvement programs; (2) strengthen public education requirements; (3) strengthen corrosion control requirements to include review of updated EPA guidance; (4) modify monitoring requirements to provide for consumer requested samples and to use samples to inform consumer actions, inform health agencies, and review corrosion control; (5) establish a health-based household action level that triggers a report to the consumer and local health agency; (6) increase water quality parameter monitoring; and (7) establish appropriate compliance and enforcement mechanisms.

The NDWAC cautioned that a revised LCR is not sufficient to address lead in drinking water risks. The report identifies shared responsibilities among federal, state, and local governments, utilities, and consumers. The NDWAC urged EPA—in cooperation with other federal agencies—to lead a national effort to reduce lead in drinking water.

Recent Developments

In 2016, EPA increased oversight of state implementation of the LCR. Among other actions, EPA sent letters to the states requesting them to improve transparency and public information regarding the rule's implementation and to ensure proper implementation. EPA urged states to place sampling protocols on their websites, work with water systems to place information on LSL locations and sampling results on websites, improve LSL inventories, and generally implement best practices to protect public health. EPA also issued a white paper on LCR revisions examining regulatory options and issues. EPA is currently seeking further input from states, local governments, and others on options for LCR revisions. (For more information, see <https://www.epa.gov/dwstandardsregulations/lead-and-copper-rule-long-term-revisions>.)

The Water Infrastructure Improvements for the Nation Act; P.L. 114-322; December 16, 2016) added several provisions to SDWA to address lead in drinking water, including requiring 24-hour public notification of water system lead action level exceedances. (For further information, see CRS Report RL31243, *Safe Drinking Water Act (SDWA): A Summary of the Act and Its Major Requirements*, by Mary Tiemann.)

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