Civil engineers report on US infrastructure neglects danger of lead drinking water pipes

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The water disaster in Flint, Michigan has brought the issue of safe water and the infrastructure that pipes it into homes and schools to worldwide attention. The prevalence of lead water pipes in the United States, particularly in older structures and the service lines connecting them to public systems, before their use was outlawed in 1986, has been exposed as a ticking time-bomb all over the country.

However, the American Society of Civil Engineers' 2017 quadrennial infrastructure report card does not even mention the issue of the public health danger posed by lead water pipes.

The report's subsection on drinking water cites the American Water Works Association (AWWA), an organization representing water utilities, which estimates that at least $1 trillion needs to be invested in upgrading US water systems. The AWWA report, issued in 2012, specifies that the sum—required over the next 25 years—is only for buried drinking water assets and does not include waste treatment, storm drains and other infrastructure.

The addition of orthophosphates into the water by public systems is the conventional method for corrosion control, which creates a coating inside water pipes to act as a barrier to prevent lead from leaching into the water that flows through them. This method is required by law under the Environmental Protection Agency's (EPA) Lead and Copper Rule.

The failure to implement corrosion control when Flint was switched from its long-term source of drinking water was a key element in the poisoning of the population of 100,000 and the severe degradation of the city's water infrastructure.

Even with corrosion control measures in place recent testing in locations around the country has revealed dangerous levels of lead in the tap water of millions. This has led Dr. Marc Edwards, the professor of civil and environmental engineering whose Virginia Tech University team exposed the high levels of lead in the water of Flint residents in the summer of 2015, to criticize corrosion control methods a "Band-Aid."

Implicitly, to universally ensure safe drinking water, all lead pipes—whether in private homes or in public distribution systems—must be replaced with safe non-lead alternatives.

Dr. Edwards, one of the United States' preeminent experts on lead poisoning from drinking water, has publicly stated on numerous occasions that no one with lead pipes can trust that the water coming out of their tap is safe.

Asked by the *World Socialist Web Site* to comment on the omission of lead pipes in the ASCE report Dr. Edwards explained, "They usually avoid talking about the lead pipes, because utilities would prefer to absolve themselves of all responsibility for lead pipe in the first place. Of course, this defies not only common sense, but the reality that water utilities required homeowners to install the lead pipe in the first place. Some cities are even 'gifting' the lead pipe to consumers—claiming that utilities have never owned them at all!"

There are varied estimates as to the number of lead service lines in use in the US. In 1991, when the Lead and Copper Rule was instituted, the EPA estimated there were more than 10 million such lines. In a 2016 report, the AWWA estimated that it was around 6.1 million. Other estimates range from 5.5 million to 7.1 million. David A. Cornwell, president of Environmental Engineering & Technology and co-author of the AWWA report, noted: "Approximately 7 percent of the homes connected to community water systems have a lead service line. There are about 15 to 22 million Americans nationally served by lead lines."

A 2012 investigative report by NBC News on lead-in-water notes that the danger posed by lead pipes and the half measures taken to replace them is well established. “Since the 1970s, lead has emerged as the most dangerous neurotoxin known to man, potentially damaging the developing brain and nervous system, causing lifelong learning disabilities and other serious problems. It has been taken out of gasoline, removed from paint and banned from children’s toys. Yet practices developed to keep lead out of water, under an EPA rule, have backfired and can actually increase the hazard…”

This refers to the practice of “partial pipe replacements,” where lead pipes are replaced only up to the private owners’ property lines. This was allowed in a 2000 amendment to the Lead and Copper Rule by the EPA as a result of a 1993 suit by the AWWA and years of lobbying. Partial pipe replacement, it was found, actually *increased* the potential of lead poisoning the water.

NBC News reported, “Partial pipe replacements can physically shake loose lead fragments that have built up and laid dormant inside the pipe, pushing them into the homeowners’ water, and spiking the lead levels, even where they previously were not high. In addition, the type of partial replacement that joins old lead pipes to new copper ones, using brass fittings, ‘spurs galvanic corrosion that can dramatically increase the amount of lead released into drinking water supplies…’”

The practice that Edwards terms “gifting,” in which ownership of lead service lines is transferred from the public utilities to property owners, is a despicable ploy used by water utilities to evade EPA regulations which call for their replacement.

After the lead-in-water crisis of 2001-2006 in Washington, D.C., Edwards and his research partner Yanna Lambrinidou, who played the critical role in exposing the crisis, expressed concerns that the D.C. water system would escape responsibility for the lead pipes remaining in the system, having “gifted” them to homeowners.

Most homeowners or tenants, particularly those who live in older buildings, had nothing to do with the installation of internal pipes or fixtures. Replacing them is impossible for a huge portion of the population which lacks the financial means, and logically, a higher percent of that population lives in housing with lead pipes.

Cost estimates for replacing all lead public water delivery pipes varies from $30 to $50 billion, however private homes which contain lead pipes are not counted in such reports. It is no surprise then that the ASCE report avoids talking about lead pipes given the scope of the problem and the immense resources which would need to be expended to guarantee everyone safe drinking water free of lead.