Water NSF Matters

Lead and the Corrosion It Leaves Behind: What the Washington, D.C., Case Taught Us

By Tom Bruursema

Recent events in Washington, D.C. regarding lead contamination have created an enormous amount of concern, controversy, and reflection on the frailty of our nation's drinking water supplies. Perhaps the overwhelming reaction was a bit exaggerated, considering it happened at the hub of the media world when it comes to pack journalism. In spite of this, no one can argue that this is yet another validation of the potential risk consumers face with drinking water.

Throughout these events, the matters of water quality and water treatment quickly became a household topic. While the media may have misdirected the issue in some ways, for the most part the numbers spoke for themselves. The lead contamination was widespread—as was the source, i.e., lead pipes in distribution lines and residential plumbing—and the concentrations were at levels that crossed the regulated threshold of safe water. The April 2 proposal by the District of Columbia Water and Sewer Authority (DC-WASA) was to "remove all known lead service lines from the public space no later than Sept. 30, 2010." This was for the public distribution system only and not for residences. According to DC-WASA, an estimated 23,000 homes are connected by lead service lines, representing 15 percent of households. Another 21,000 have service lines whose connection service is unknown. Sampling conducted last year showed 67 percent of 6,118 samples exceeded the regulated level of 15 parts per billion (ppb). A major problem is an understatement. Compounding the issue was the obvious problem of no easy fix to immediate health risk.

Available solutions

The obvious need has been for immediate, readily available options to consumers, thus avoiding reliance on the contaminated public water supply. Water treatment systems and bottled water soon became the obvious target of interest and information gathered by the media and consumer. Several local media companies interviewed NSF including local newspapers, a radio talk show, and participation in online chats. The questions posed to NSF were obvious—What is available to me as options? More importantly, how do I know that these options are any better or safer than what I was told was safe before? Standards and certification became the talking points that brought this assurance to the consumers when choosing these readily available options.

For those familiar with NSF/ANSI standards, you will appreciate that lead—like all metal contaminants—is tested at two pH levels, 6.5 and 8.5. This ensures both the more soluble form of lead at lower pH levels and the more colloidal form of lead at higher pH levels are reduced to safe levels. In addition, the maximum effluent concentration allowed in all samples is 10 ppb (micrograms per liter, µg/L) rather than the regulated level of 15 ppb, giving an added safety factor to account for other sources of lead. In the case of media-based systems, they must perform out to 200 percent of the stated capacity, unless they have a performance indication device where they must reach 120 percent. Those are the major points of conservatism and safety built into the standards, though there are others like cycle times, inlet pressures, duplicate testing, etc., alongside material safety and structural integrity. These all reinforce the high performance bar that must be achieved by certified water treatment systems.

All aspects of standards, in addition to independent testing and certification, were vitally important in not only delivering readily available solutions to Washington, D.C., residents, but also delivering peace of mind in choosing those options. Such standards and certification gave authorities, including the U.S. Environmental Protection Agency (USEPA), the Centers for Disease Control and Prevention (CDC), the Washington, D.C., Emergency Information Center and DC-WASA, the confidence to inform consumers that filters were available to help them, and equally important to choose those that have been independently certified (see *Newsreel* this issue). The fol-

lowing websites provide the language used by each agency:

• EPA: www.epa.gov/safewater/lead/leadfactsheet.html

• EPA: www.epa.gov/dclead/

• CDC: www.cdc.gov/nceh/lead/spotLights/lead inwater.htm

• Washington, D.C. Emergency Information Center http://emergencycenter.dc.gov/eia/cwp/view.asp?a=3&Q= 562978&PM=1

• D.C. Water and Sewer Authority: www.dcwasa. com/lead/faq.cfm

In addition, thanks to the generosity of two certified companies, DCWASA not only cites filters as a solution, but also saw to the distribution of certified filters to all 23,000 residences connected by lead service lines.

Lead levels too high?

The one aspect of standards, however, that may not have been a perfect match with Washington, D.C.'s needs was the influent test challenge. This question arose frequently, and NSF clarified that the standard—whether for media-based systems, reverse osmosis or distillation—was set at an influent concentration of 150 ppb. The NSF/ANSI standards generally establish influent concentration levels at the 95 percent occurrence level, as established by the U.S. Geological Survey (USGS). In other words, it represents 95 percent of the highest levels detected by the USGS. Why not 100 percent? The NSF/ANSI standards are minimum standards. Incredibly conservative? Absolutely. They have to be; however, expecting them to treat every possible contaminant level known to exist is neither practical nor necessary for nearly the entire population.

So, how did the standards fare in Washington, D.C.? Looking at the numbers, as reported in the Washington, D.C. "Interim Report of the Interagency Task Force on Lead in Drinking Water," we find that 18 out of 6,836 first-draw samples exceeded 150 ppb, and 34 out of 6,836 second-draw samples exceeded 150 ppb. That's 0.26 percent and 0.50 percent, respectively. In other words, treatment systems certified to NSF/ANSI standards for lead reduction could properly treat 99.5 percent of those taps sampled. Clearly, this is well below the 5 percent established by the USGS and used in NSF/ANSI standards. This reinforces the approach of the NSF Joint Committee to properly apply test challenge levels to fit the majority of the country's needs, even under such unusual situations as Washington, D.C.

What the future may hold

It will be a long time before Washington, D.C., solves its lead problem, and far longer before residents regain their confidence in drinking tap water. And what about the same problem occurring in other parts of the country? While still under investigation, a prominent theory as to the cause of the problem in Washington, D.C., was related to changes in water treatment from chlorine to chloramines. The change was theorized to be enough to impact the long accumulated scale on the surface of lead pipes, leaving them more exposed and open to corrosion of lead. If true, is this an isolated case? You can imagine there are many who fear it's not.

On April 7, Sen. Jim Jeffords made a statement to the Senate and to the committee chairman responsible for the Army Corps of Engineers and the USEPA, announcing he would be introducing legislation to modify the Safe Drinking Water Act (see *Pipelines*, this issue) in the following ways:

• Require immediate notification of all homes with elevated lead level results;

• Require public water systems to provide in-home filters where lead is a problem;

• Prohibit lead in plumbing fixtures;

• Require immediate nationwide testing of public water systems, and

• Eliminate lead service lines and lead pipes.

While some may argue this is an exaggerated reaction, it's the fear and demands of the consumer for safe drinking water that will drive this issue at the policy-setting level. The recognition of the potential size of this problem, and the health risk it poses, can certainly place it in the category of national concern.

Conclusion

With or without wide sweeping legislation, we can expect to hear a lot more about lead. And what about other contaminants? Where will perchlorate conclude? Are we better prepared now for terrorist threats to our water supplies? Water quality is a global issue that no one, including the United States, has solved. With the continued growth and industrialization of the world, we can expect that problem to only increase. It's safe to assume that treatment in the home will be an ever-increasing solution to a growing problem. And this, too, has its shortcomings and potential for failure if we don't fully appreciate and tend to the needs of the market. Most important is consumer education including proper selection, installation, use and maintenance of drinking water treatment units. It's a task many of us have already embarked on and need to maintain as a priority. Combining this with the well-established platform of testing and certification to American National Standards, the industry will continue to be recognized as the solution to safer drinking water.

About the author

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