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Comments to the record of USEPA's proposed Lead and Copper rule revision.

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I was Director of the Drinking Water Standards Division in 1989 when the original LCR was proposed and am very familiar with the rationale for its design. The goal for this new proposal should be to provide improvements to make the LCR more implementable and enforced, rather than more complex and costly.

As stated early in the preamble, the U.S. child population lead exposure has been significantly reduced over time and since the 1991 LCR. Median child blood leads are now more than 95% lower since the 1976-1980 NHANES II, from about 15 ug/dL to much less than 1 ug/dL today. The mean blood levels for children aged 1 to 5 had rapidly dropped by 80% to 3.2 ug/dL by the 1988-1991 NHANES III phase 1 national survey[1]. That should be an important factor for understanding the significance of drinking water as a contributor to exposures in 1991 and today. Its percentage contribution to the averages is probably higher than it was in 1976-1980 or 1988-1991, but the absolute value is much smaller and the total exposure is smaller because numerous positive actions have occurred including removals of several million lead service lines[2]. Those authors (Cornwell et al) estimated that as of their study in 2013, about 6-7% of the community water system population lives in homes with either a partial or full lead service line, and about 30% of community water systems still had some lead service lines. Having a lead service line does not equate to excess lead releases and exceeding the LSR, if the water is not corrosive.

EPA should begin at that point to describe the actual significance of the remaining exposures. It is well known that there are still older homes with non-mitigated lead painted surfaces, and that exposure to paint dust in old houses and during renovations of old houses is the cause of most of the high values of blood lead that occur. There remain some number of very high blood lead levels up to and exceeding 45 ug/dL, whose causes (probably usually old lead paint) definitely need to be reduced quickly. So, the important questions are: what is the best continuing lead reduction strategy today, and what are the marginal benefits of each approach, relative to costs. There is some number of water supplies that are still not compliant with the 1991 LCR, so the issue is: why not, and how to improve the outcome with a reasonable chance of success.

Stating that there is no safe level begs the question of what should be done now to further reduce all lead exposures and also in some drinking water associated with water that is excessively corrosive toward leaded brass fixtures, accumulated in old galvanized iron pipe sediments, and lead service lines in homes. All substances have dose-related risks, and there is debate on the magnitude of subtle small IQ losses as the endpoint that has been stated by some studies in the 5 ug/dL child blood vicinity. CDC has reduced 'Concern Levels' over the years down to 10 ug/dL.

They then determined, as of 2012, that the 'Reference Level' was 5 ug/dL; the Reference Level is defined as the level of the 97.5th percentile. Recommended actions in both cases are identical, to locate the source and reduce it. Medical intervention by chelation therapy may be considered at 45 ug/dL. The Reference Level will probably be reduced since the national median is now well below 1 ug/L.

The EPA proposal glosses over these well known matters, and does not articulate the specific causes of remaining non-compliance of the 1991 Lead and Copper Rule, 29 years later. The proposal is fundamentally the same as the 1991 rule; it retains the 15 µg/L first draw stagnant sample in higher risk home locations which are now specified, and the 90th percentile system value. However, it becomes more lengthy and complicated, and proposes additional costly and not necessarily effective additional reporting and record keeping that does not deal directly with the reasons for the remaining non-compliance. Whatever the fundamental compliance problem has been, reporting is not the likely or only solution to rectify it. Ultimately, the failing has been the inadequate oversight by some regulators and incomplete commitment to compliance by some unknown number of water suppliers. So, the proposal should explain how compliance can be improved and also, determine whether some adjustments in monitoring or other processes could facilitate lead reduction actions, and provide needed technical assistance while simplifying the rule itself.

EPA should logically approach a proposal with something like this sequence:

1. What is the history of implementation of the LCR since the 1991 rule?

The LCR has not been fully implemented, as far as we know, and in fact we really do not know the extent, since EPA has not stated it. We know that comprehensive data have not been generated for a variety of unacceptable reasons, but there should be a reasonably quantitative assessment estimate of the current situation, with ranges of numbers of community water system compliers and non-compliers by size and water type categories, e.g., water system size and groundwater/surface water. That critical information should be prominent in the preamble.

2. What have been the problems with implementation of the 1991 LCR? Why have some states and communities apparently not been fully successful?

The causes could logically include:

- in house (residential) monitoring difficulties due to access requirements, inconvenient sampling requiring at least 6 hour stagnation first draw, before any water has been used in the home,
- compliance and technology complications because water characteristics are diverse and several technologies might need to be evaluated in some situations,
- incomplete state oversight which has apparently allowed some water systems to not carry out the basic regulatory requirements, including monitoring and reporting,

- practical feasibility especially in small systems with limited or no professional expertise; costs, which would also impact small systems most,
- or, even lack of perception of potential risks, thus reduced incentive.

3. How does the proposal specifically address each of those issues?

How could it simplify the technical elements and improve the reliability of the sampling data:

- modifying the sample collection monitoring methodology,
- requiring that samples be collected by experienced officials,
- encouraging sampling during the day by appointment, after 6 hours of stagnation,
- enhancing enforcement by requiring that states comply with their primary enforcement requirement legal responsibilities and report regularly to EPA,
- by providing for additional technical assistance,
- additional support funds via the State Revolving Fund.

Additional Comments

Since the current proposal does not include all of numbers 1-3 above, how can it determine with any assurance of success what corrective actions are needed and their consequences and costs? The proposal is extremely lengthy and complex and difficult to understand, and the additional reporting seems oppressive to the extent that it would likely set back compliance, as well as raise costs for the communities and the states.

Only one regulatory action level should be specified. The addition of an ambiguous 10 ug/L action level, if adopted, would add to the confusion. It would be like having two regulatory requirements, 10 ug/L and 15 ug/L with similar actions. That part of the proposal should be deleted. Instead a logical statement to the effect that if the 90th percentile testing result approaches the 15 ug/L regulatory action level, it is in the best interest of the water supplier to determine the factors and begin to reduce the potential that it could be exceeded in the future. If there is any consideration of 10 ug/L as a regulatory action level, it would be necessary to carry out detailed impact assessments, and probably require a re-proposal, which would further slow down the process..

The proposal's projected annual impact costs are very high and perhaps not commensurate with benefits in the current low range of child blood lead levels, and water contributions, which are different/lower than they were in 1991. One area that needs to be simplified and facilitated is the monitoring procedure. It is important to know what the consequences are of corrosive water in plumbing because people drink that water, not the water leaving the plant or in the distribution system. Thus, it is necessary to have a stagnation period (>6 hr in the LCR) as a virtual worst

case screening process. It would be better if the sampling was done by qualified people rather than the home owners. That requires permission for access.

The state should collect data on actual blood lead consequences of a community not being in compliance. Many communities have routine lead-in-blood sampling for infants and young children. That data should be mined with respect to compliance status and individual homes where higher blood leads are found or where lead service lines exist. Homes with higher results should be examined to determine whether their problem is old lead paint, or other contributors like old lead service line or old galvanized pipe.

Some might suggest changing from the current LCR first draw stagnant water testing, which is a surrogate for excessive corrosivity, leading to corrective actions, to an MCL for lead applied to tap water, as is done in some countries. The LCR is more protective than such an MCL would be because it is driven by virtual worst case corrosion effects, rather than assumed water that is consumed. Some of those countries often have old lead pipe in the home plumbing, as well as a likely lead service line. Compliance would generally be determined by random monitoring of flowing tap water without significant stagnation time, and they are intended to attempt to address water that is routinely consumed. That would simplify the monitoring, but it would require establishing an MCL based upon some quantitative health based linkage between tap water concentrations and blood lead levels, absent other sources. Problems include generally trying to establish that linkage, and not locating the major lead contributors. The implementation could be easily perverted by simply running the water sufficiently prior to sampling, so that lead concentrations would never likely be substantial at the tap. That would not be supportable and would require a radical reassessment and totally new proposal.

Conclusion and Recommendations

The overall recommendation is that:

- EPA should provide the supporting analyses and information as described above,
- simplify the proposal and reporting requirements, and reaffirm the existing LCR,
- reaffirm the state responsibilities and commit to greater oversight and compliance,
- commit to providing more training for mitigation personnel, and providing technical support,
- re-examine the monitoring and sampling methodology to determine if it can be modified so that it can be facilitated. Such an adjustment would not require re-proposal, and probably not a reopening of the comment period.
- Additional practical suggestions are described in reference 3 and incorporated here by reference.

Considering changing the lead service line replacement schedule to 3% per year from 7% per year is irrational if there is a risk to be abated. One could argue that even 7% per year is too slow

(about 14 years), although it has been 29 years since the 1991 LCR. So that begs the risk reduction issue.

Requiring a 5th liter 2nd draw sample is arbitrary and not necessarily going to draw water from the service line in many homes because of the variety of distances from the tap to the service line. A better and more useful option would be to draw the 2nd sample when a noticeable temperature change was noted from the flowing tap water. In addition, concurrent analysis of iron in both samples would give an indication of the presence of old galvanized iron plumbing in the home and the potential that it could be contributing lead at the tap from mobilizing sediments with accumulated lead from the service line or from incoming distributed water. Washington DC, found that there was a high correlation between high lead and high iron in compliance sampling results and the presence of galvanized pipe in the older homes.

Corrosion control can be a very complex process so technical support should be a major component of the final rule. Corrosion adjustments must be an especially difficult problem especially for a small groundwater supply that has corrosive source water, and does not currently treat the water, but just pumps with perhaps just chlorination.

It may well be that the best and most cost effective approach for finally reducing remaining lead exposures from drinking water would be legislation to include lead service lines and possibly galvanized iron plumbing mitigation as part of normal real estate transactions, like radon and lead paint mitigation that is now often required. That would automatically accelerate the attrition of those plumbing features, and the cost would be hidden in the sale price and effectively shared between the buyer and seller.

I also concur with the comments to the record on inadequate enforcement provided by Cynthia Giles, and generally support comments from AWWA.

References

1. Pirkle, JL, et al. (1994). The Decline in Blood Lead Levels in the United States. The National Health and Nutrition Examination Survey (NHANES). JAMA 272(4): 284-291.

2. Cornwell, DA et al. (2016). National Survey of Lead Service Line Occurrence. JAWWA 108(4). 68 (expanded summary). doi.org/10.5942/jawwa.2016.108.0086 pp.E182-E191.

3. Cotruvo, JA (2019). Lead Reduction is a National Success Story. JAWWA 111(4): 73-75. https://doi.org/10.1002/awwa.1277.