




Proposed Lead and Copper Rule Improvements (LCRI)  
NDWAC Consultation Meeting  
November 30, 2022

# What is the purpose of today's meeting?



- To provide the National Drinking Water Advisory Council (NDWAC) with information on the development of the proposed Lead and Copper Rule Improvements (LCRI) National Primary Drinking Water Regulation (NPDWR)
  - Discuss basics of lead in drinking water
  - Provide an overview of the Lead and Copper Rule Revisions (LCRR) published in January 2021
  - Discuss cost information
  - Discuss key areas of consideration for potential LCRI requirements
- Solicit input from National Drinking Water Advisory Council (NDWAC) and their members on the proposed Lead and Copper Rule Improvements (LCRI)



# Background on Lead in Drinking Water and the Lead and Copper Rule

# What do I need to know about lead in drinking water?



- Lead in pipes, solder, and faucets can dissolve in water or break off as particles.
- When present, lead service lines are the most significant source of lead in drinking water.
- In children, exposure to lead can cause serious health effects like lower IQ, learning and behavioral problems.
- In adults, health effects can include higher risk of heart disease, high blood pressure, and kidney or nervous system problems.

# What is the Lead and Copper Rule?




- The Safe Drinking Water Act (SDWA) authorizes EPA to establish regulations for public water systems.
- EPA first established the Lead and Copper Rule in 1991 to reduce exposure to lead and copper in drinking water.
- Applies to ~68,000 community (CWS) and non-transient non-community (NTNCWS) public water systems serving over 300 million people.
- The rule requires some water systems to treat drinking water to keep lead in place when lead (or copper) levels in water require action. This is called corrosion control.
- When corrosion control is not enough to reduce lead levels, the LCR requires water systems to take additional actions including lead service line replacement and public education.

# What is the Lead and Copper Rule?



- Maximum Contaminant Level Goal (MCLG) for lead: 0  $\mu\text{g}/\text{L}$ 
  - The MCLG is zero because there is no level of exposure to lead that is without risk.
- Action Level (AL) for lead: 15  $\mu\text{g}/\text{L}$ 
  - The AL is set at a level based on feasibility.
- The LCR requires water systems to test water at the tap in certain homes that have lead in the plumbing.
- Water systems must compare the 90<sup>th</sup> percentile of lead sample results to the AL to determine if they need to take actions to reduce lead exposure.



# Overview of the Lead and Copper Rule Revisions (LCRR)

# The Lead and Copper Rule Revisions (LCRR)



- The LCRR was promulgated on January 15, 2021.
- EPA extended the effective date to December 16, 2021, to conduct a review of the LCRR in accordance with Executive Order 13990.
- EPA delayed the compliance date of the LCRR until October 16, 2024, to:
  - Maintain the same time period between the effective date and compliance date in the LCRR, and
  - Provide drinking water systems with adequate time to take actions needed to assure compliance with the LCRR after it takes effect.



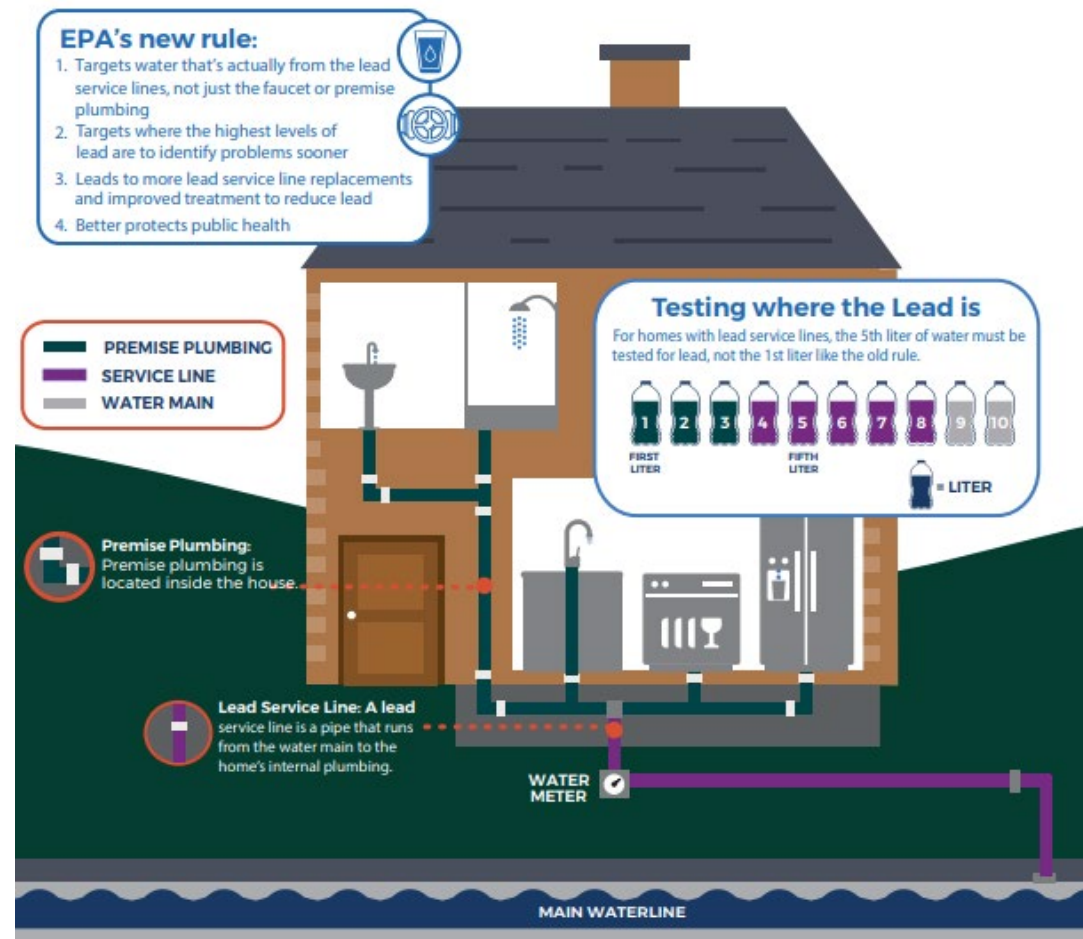
# LCRR Lead Service Line Inventory



- Requires water systems to develop a lead service line (LSL) inventory.
- Service line inventories must be publicly available (online for systems serving > 50,000 people).
- Water systems must notify customers annually if they have an LSL, galvanized requiring replacement (GRR), or unknown.

# LCRR Tap Sampling

- Requires water systems to sample for lead at homes served by lead service lines (LSLs).
  - 5<sup>th</sup> liter sample
- Prohibits water systems from providing instructions that may temporarily reduce lead levels before sampling.
- Requires the use of wide-mouth sampling bottles.



# LCRR Lead Trigger Level



- Establishes a new Trigger Level (TL) of 10  $\mu\text{g}/\text{L}$  in addition to the AL.
- Systems that exceed the TL are required to take actions sooner:
  - If a system does not have corrosion control treatment (CCT), they must conduct a study which prepares the system to install CCT if they later exceed the AL.
  - If a system has CCT, they must make adjustments, so it is more effective at reducing lead levels.
  - If a system has LSLs, they must start a goal-based replacement program and inform the public of opportunities to have their LSLs replaced.

# LCRR Monitoring Frequency



- Systems above the TL must monitor for lead at least annually. They must continue annual monitoring for at least two years after the last monitoring period above the TL.
- Systems above the AL must monitor every six months. They must continue six-month monitoring for at least two years after the last monitoring period above the AL.
- Systems with a source water or long-term treatment change must monitor every six months.

# LCRR Corrosion Control Treatment



- Improves CCT requirements.
- Removes provisions allowing water systems to stop the CCT installation process if they drop below the lead AL.
- “Find-and-Fix” requires water systems to evaluate individual sites with lead tap sample results greater than 15 µg/L.
  - Water system must determine if a “fix” is needed (e.g., localized adjustment to CCT, flushing, etc.).
  - The fix may be outside of the system’s control (e.g., premise plumbing) but they must provide documentation to the State.

# LCRR Replacing Lead Service Lines



- Water systems that exceed the AL must fully replace LSLs to count towards the mandatory replacement rate (3%).
- Eliminates loopholes that allowed LSLs to remain in place (e.g., test out provisions) after replacement requirement is triggered.
- Water systems serving > 10,000 people that exceed the TL must implement a goal-based lead service line replacement (LSLR) program.
- Water systems serving > 10,000 people must conduct LSLR if they exceed the AL regardless of CCT status.
  - Must conduct LSLR until the system is at or below the AL for two years.

# LCRR Small System Flexibility



- Applies to small community water systems (CWSs) serving  $\leq 10,000$  people and non-transient non-community water systems (NTNCWSs).
- If a water system exceeds the TL, they must choose a compliance option and obtain approval from the State.
- The water system must implement the approved option if they later exceed the lead AL.
- Compliance options:
  - Install and maintain optimized CCT.
  - Replace all LSLs within 15 years (cannot stop once started).
  - Install and maintain point-of-use devices (POUs).
  - Replace all lead-bearing plumbing.

# LCRR Public Education and Notifications



- Requires water systems to notify customers within 24 hours if the system exceeds the lead AL (WIIN Act).
- Water systems must notify customers whose individual tap sample  $> 15 \mu\text{g/L}$  within 3 days.
- Requires water systems to deliver public education materials to impacted consumers during water-related work that may disturb LSLs.
- Revises the Consumer Confidence Report requirements:
  - Clear health effects language
  - Statement on availability of LSL inventory
  - Range of tap sample levels and public access to results



# LCRR Sampling for Lead in Schools



- Requires CWSs to test for lead in elementary schools and child care facilities.
  - Develop a list of all licensed schools and child care facilities they serve.
  - Elementary schools and child care facilities are sampled once over a 5-year period.
  - Secondary schools are sampled if they request it.
- After one 5-year round, the water system must sample for lead in any school or child care facility on request.
- Systems must provide a copy of EPA's 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities.
- EPA does not have the statutory authority under SDWA to require schools and child care facilities to take remediation actions or conduct additional sampling.



# Cost Information for Actions to Reduce Drinking Water Lead Levels

Planned revisions to the LCRR under the LCRI would result in more actions to sample and reduce lead in drinking water. The following slides present cost and other information about these potential actions.

# Tap Sampling and Point-of-Use



- Tap Sampling
  - Per household estimated sampling costs range from \$49 to \$109 (2021\$).
  - Includes average lab costs, costs for providing and delivering sampling materials, and sample pick-up costs
  - These estimates were developed for the LCRR. We expect revisions to the sampling protocol to increase costs.
- Point-of-Use Devices (POU)
  - The annual average cost of POU's ranges between \$125 - \$128 per household per year (2021\$)
  - Includes device purchase, scheduling and installation labor, labor for maintenance, and replacement filters
  - These estimates were developed for LCRR and may change based on LCRI requirements.

# Estimated Number of LSLs by System Size Category



System Size (Population Served)	1991 RIA, Adjusted <sup>a</sup>			Cornwell <i>et al.</i> , 2016 <sup>b</sup>		
	Number of Systems with LSLs	Total Number of LSLs	Average Number of LSLs per System for Systems with LSLs	Number of Systems with LSLs	Total Number of LSLs	Average Number of LSLs per System for Systems with LSLs
≤100	1,750	41,000	20	2,430	9,000	5
101-500	3,110	292,000	90	3,180	56,000	20
501-1,000	2,090	559,000	270	1,190	64,000	50
1,001-3,300	3,120	690,000	220	1,730	223,000	130
3,301-10,000	2,090	965,000	460	1,040	402,000	390
10,001-50,000	1,470	1,639,000	1,120	1,270	2,696,000	2,130
50,001-100,000	240	564,000	2,330	290	728,000	2,540
100,001-1M	250	2,504,000	9,790	200	1,444,000	7,290
> 1M	10	1,984,000	146,010	10	666,000	57,050
<b>TOTAL</b>	<b>14,130</b>	<b>9,239,000</b>		<b>11,340</b>	<b>6,287,000</b>	

RIA = Regulatory Impact Analysis.

**Source:** See “Derivation of LSL Number CWS”, available in the docket at EPA-HQ-OW-2017-0300 at [www.regulations.gov](http://www.regulations.gov).

<sup>a</sup> USEPA. 1991. Drinking Water Regulations; Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Regulatory Impact Analysis. RIN 2040-AB51. The total number of LSLs and average number of LSLs per system were adjusted to account for mandatory and voluntary LSLR and system consolidation since 1988. See Section 4.3.4 of the LCRR Economic Analysis document for additional information on the adjustments.

<sup>b</sup> Cornwell, D.A, R.A. Brown, and S.H Via. 2016. National Survey of Lead Service Line Occurrence. Journal American Water Works Association. 108(4): E182-E191.

EPA computed the number of systems with LSLs using information on the percentage of all systems with LSL.

# Example Costs for LSLR



<b>Low and High Estimates for LSLR Unit Costs (2021\$)</b>			
<b>Type of LSLR</b>	<b>Average</b>	<b>Low</b>	<b>High</b>
Utility-Side	\$5,000	\$2,700	\$6,300
Customer-Side	\$3,900	\$2,800	\$4,300
Full Replacement	\$5,600	\$4,400	\$6,600
Utility-Side, Planned	\$4,000	\$2,200	\$5,000
Full Replacement, Planned	\$4,500	\$3,500	\$5,300

1. Values are based on utility reported estimates (total of 38 utilities, converted to 2016\$ then inflated to 2021\$ with GDP price deflator). Values are rounded.
  2. The planned costs in the last two rows are further adjusted downward 20 percent to represent replacements that are part of planned capital improvements
  3. The low value is the 25<sup>th</sup> percentile and the high value is the 75<sup>th</sup> percentile
  4. Source: Exhibit 3-A of the Economic Analysis Appendices for the final LCRR.
  5. EPA intends to update these numbers for the LCRI EA
- Full LSLR costs range from \$3,500 to \$6,600 per line.

# CCT Cost Information



## Initial Capital and Annual O&M Cost for Systems Installing CCT by System Size Category

Population Served	Initial Capital Cost	Annual O&M (per year)
> 500,000	\$621,000 to \$8,268,000	\$237,000 to \$3,067,000
100,001 to 500,000	\$233,000 to \$2,372,000	\$68,000 to \$598,000
50,001 to 100,000	\$174,000 to \$1,770,000	\$31,000 to \$269,000
10,001 to 50,000	\$83,000 to \$681,000	\$11,000 to \$79,000
3,301 to 10,000	\$69,000 to \$324,000	\$5,000 to \$26,000
501 to 3,300	\$25,000 to \$196,000	\$3,000 to \$16,000
25 to 500	\$23,000 to \$93,000	\$3,000 to \$7,000

1. Costs originally reported in 2017\$ and are inflated to 2021\$ with GDP price deflator
2. Capital costs are initial, one-time costs
3. Costs reflect installing and operating a new CCT for systems that do not currently have CCT in place. Systems that adjust or reoptimize existing CCT would have lower costs
4. Annual O&M costs are in dollars per year
5. Costs assume the same CCT technology is applied at all entry point to the distribution system
6. The range of costs shown reflect variations in the following: WBS model component cost level (low, mid, or high), choice of CCT technology (phosphate addition, pH adjustment, or both), water source (ground water or surface water), variations in starting and target pH

# CCT Cost Information (cont.)



## Annualized Costs for Systems Installing and Maintaining CCT by System Size Category

<b>Population Served</b>	<b>Annualized Cost at 3%</b>	<b>Annualized Cost at 7%</b>
> 500,000	\$277,000 to \$3,618,000	\$294,000 to \$3,842,000
100,001 to 500,000	\$82,000 to \$756,000	\$89,000 to \$821,000
50,001 to 100,000	\$42,000 to \$388,000	\$46,000 to \$436,000
10,001 to 50,000	\$16,000 to \$124,000	\$19,000 to \$143,000
3,301 to 10,000	\$11,000 to \$49,000	\$12,000 to \$57,000
501 to 3,300	\$7,000 to \$30,000	\$8,000 to \$35,000
25 to 500	\$5,000 to \$13,000	\$5,000 to \$15,000

1. Costs originally reported in 2017\$ are inflated to 2021\$ with GDP price deflator
2. Annualized costs are total capital costs, annualized at the discount rate shown over the useful life of the technology, plus annual O&M Costs





Lead and Copper Rule  
Improvements  
Key Discussion Topics



# Lead and Copper Rule Improvements



- Propose Lead and Copper Rule Improvements (LCRI) in 2023 and finalize by October 16, 2024.
- Key areas:
  - Replacement of lead service lines (LSLs) while equitably improving public health protection.
  - Improving the methods to identify and require action in communities that are most at risk of elevated drinking water lead levels.
  - Exploring ways to reduce the complexity of the regulation.
- Other options may include the LCRR provisions for
  - small system flexibility,
  - school and child-care sampling,
  - risk communication, and
  - corrosion control treatment.

# Identifying and Replacing Lead Service Lines: Key Questions



What are the opportunities and challenges related to identifying and replacing service lines:

- **Achieving 100% LSLR**
  - How quickly can systems achieve 100% LSLR?
  - What factors impact a system's rate of LSLR?
  - What barriers exist for engaging customers about full LSLR?
  - How can systems ensure equity in replacements?
- What are the most effective and equitable ways for water systems replace lead service lines?

# Tap Sampling and Compliance: Key Questions



What are the opportunities and challenges related to tap sampling and compliance:

- Should EPA require systems to collect both 1<sup>st</sup> and 5<sup>th</sup> liter samples at lead service line sites and use the higher concentration in the 90<sup>th</sup> percentile calculation for lead?
  - What potential challenges may systems face when complying with an updated tap sampling protocol?

# Reducing Rule Complexity: Key Questions



- What are the opportunities and challenges related to complying with a revised action level and trigger level construct:
  - What potential revisions to the AL/TL construct could reduce rule complexity?
  - Should EPA maintain the TL?
  - What is a feasible AL lower than 15 ppb?
  - Should additional steps be required to be taken to protect public health in systems with sustained levels of lead above the AL?

# Small System Flexibility: Key Questions



What are the opportunities and challenges related to the small system flexibility:

- If the LCRI requires small systems to replace LSLs regardless of their 90<sup>th</sup> percentile lead level, should the LSLR remain a small system compliance option for small systems exceeding the lead AL?
  - Should other compliance options be added for small system flexibility? If so, what would such compliance options be?
  - Should EPA reduce the small system flexibility threshold from 10,000 (e.g., to 3,300 or fewer) for all or some of the compliance options?

# Additional Questions



- Is there any additional information or concerns you would like to share with EPA?
- EPA would appreciate any information and data that you are able to provide on their experiences with:
  - Inventory and lead service line replacement
  - Sampling programs
  - Public education
  - Corrosion control treatment
  - Sampling for lead in schools and child care facilities
  - Other aspects of drinking water lead control programs

# Next Steps



- In addition to this consultation, EPA is seeking input from other key stakeholders and entities to inform the proposed LCRI.
  - Science Advisory Board, Small Business Advocacy Review Panel, UMRA/Federalism, tribal government officials, environmental justice-related organizations, and others
- EPA anticipates publishing the proposed rule for public comment in 2023 and promulgating a final rule by October 16th, 2024.

# Questions



- Consultation questions and follow-up:
  - Michael Goldberg, EPA Office of Ground Water and Drinking Water ([Goldberg.Michael@epa.gov](mailto:Goldberg.Michael@epa.gov))
  - Hannah Holsinger, EPA Office of Ground Water and Drinking Water ([Holsinger.Hannah@epa.gov](mailto:Holsinger.Hannah@epa.gov))
- Additional information on the LCRR/LCRI:
  - <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>
  - <https://www.epa.gov/ground-water-and-drinking-water/lead-and-copper-rule-improvements>