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DIVISION OF WATER
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Conducting a Service Line Inventory

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A Start-up Guide for Public Water Systems

On December 17, 2021, the EPA published notice (86 FR 71574) that the Lead and Copper Rule Revisions (LCRR) became effective on December 16, 2021.

The LCRR calls for many changes in monitoring and managing lead and copper in drinking water. The first change to implement will be a required Service Line Inventory that all water systems must create and submit by October 16, 2024. Through the service line inventory process, water systems develop methods to identify the location of lead service lines (LSLs). Service line inventories must be made available to the public and must be included in the annual Consumer Confidence Report (CCR). Water systems serving over 50,000 must also make their service line inventories available online.

The Division of Water encourages all water systems to develop a process to create and maintain their Service Line Inventories. Service Line Inventory activities should be built into the day-to-day activities of a water system.

Service Line Inventory General Information

Every public water system is required to complete an inventory of service lines for both system-owned and customer-owned sections, and must identify:

- The primary material of each service line in the distribution system, e.g., lead, galvanized requiring replacement (GRR), non-lead (copper, PVC, etc.), or unknown, and
- The material of inactive and non-potable service lines, including those serving abandoned buildings, fire suppression systems, and irrigation systems

In order to complete the inventory, systems should reference previously-completed service line materials evaluations, existing records and resources, and when needed, on-site verification of service line material.

It will be important for water systems to proactively communicate with customers about what the service line inventory is and what the water system is doing to remediate lead in drinking water. Water systems will need to work with customers to identify and replace customer-owned lead service lines.

Benefits of a detailed, accurate inventory:

- Identify where lead is to better facilitate lead replacement
- Increase access to funding (additional lead State Revolving Funds are only available for 5 years)
- Essential for developing accurate LSL replacement plans, and for identifying underserved communities and areas with high lead concentrations
- Better inform customers to improve public health
- Improve asset management, including taking steps toward digitizing information to make it readily available for other asset management projects

Steps to Get Started

Follow these preliminary steps to prepare for a successful Service Line Inventory

Step 1: Designate a water system contact person or team to lead inventory efforts. Consider creating a Standard Operating Procedure (SOP) or other guidance document to standardize efforts.

Step 2: Evaluate what sources of information and records are available and most accessible. Available records will vary depending on the water system and the community it serves.
Possible sources are:

- Service line materials evaluations completed for prior SDWA requirements
- Records showing *date of construction* (service lines were not made of lead after 1987)
  - Construction records and subdivision plats
  - PVA records and Historic aerial photos
  - Real estate sales data
  - Building and plumbing codes and permits
  - Water system records showing the last date lead service lines were used
- Tap records (i.e., service line installation records)
- Distribution system maps and inspection records
- Area Development District records
- Building inspection records
- Past compliance sampling results

Step 3: Review available records and organize (rank) them into levels of validity and usefulness. Digitize any paper records if possible (scan the document or type the information into a database).

Step 4: Begin creating or updating a service line inventory database. DOW recommends using the Service Line Inventory template available on its website as a basis for development of the Service Line Inventory data management system.

- Start with a list of all taps and their addresses/locations.
- Add information to the database obtained from the records in Step 2 above.

Step 5: Evaluate how much information is still needed. From your list in Step 3, create two lists: 1/ all service lines that don't need further verification, and 2/ all the "unknown" service lines that need further verification either from more detailed/accurate records or a field visit.

> **Remember:** it will generally be more economical to search for records than to field verify each service line.

Step 6: Develop a verification plan by prioritizing lines with unknown materials, based on:

- Geographic sections of the system with more unknowns
- The age of the section of the system
- Reviewing lead and copper water sampling data collected since the 1991 Lead and Copper Rule (Historic lead sample results are available on Drinking Water Watch, or by emailing a request to DrinkingWaterCompliance@ky.gov.)
- Disadvantaged communities within the distribution system
- Sensitive populations affected (e.g., young children, pregnant women, or the elderly)

Step 7: Verify actual service line material by reviewing these or other documents.

- Tap, main, and meter installation records
- construction and plumbing codes
- construction/installation records
- permits (e.g., construction or plumbing)
- distribution system maps
- historical capital improvement plans
- historical master plans
- historical local ordinance changes
- community planning documents and maps
- inspection records
- PVA or tax records
- Board of Realty records

- historical SOPs
- water loss studies
- annual reports
- field/visual records
- pipe diameter (>2" usually not lead)
- aerial photos

Step 8: Field verification. Because this is the most expensive and time-consuming method of identifying service lines, it should be the last option used (except when materials can be verified during routine maintenance and operations). Water systems should take care not to disturb or damage the pipe during field verification, as this may increase lead in the customers' drinking water.

- Visual inspection of exposed pipe. This may be accomplished through the meter pit in some cases, or through use of excavation via hydroexcavation (e.g., use of vacuum truck), potholing, etc. Document with photographs.
- Private line inspection inside the foundation wall. Encourage customers to use a scratch or magnet test, and document with photos.
- CCTV camera, looking for the bulb-shaped "wiped joint" of a LSL (this is a less accurate method)
- Water quality sampling (see 2022 EPA guidance for details).

Step 9: Develop a process for ongoing updates of the Service Line Inventory. Examples include:

- Create a place on work orders to document service line materials during routine maintenance (Required under the LCRR: 40 CFR 141.84(a)(5))
- Use a survey app like Survey 123 or other to easily enable recording service line materials while doing routine maintenance in the field.
- Establish procedures to communicate with customers regularly about lead and to engage them in the service line inventory and replacement process.
- Create relationships with others who can assist, such as plumbers and plumbing inspectors, building inspectors, homeowners associations, Housing and Urban Development (HUD) staff, and public health departments.

Step 10: Customer communication plan. It is essential to work with customers throughout the development of the Service Line Inventory, and if service line replacements are necessary, customer involvement will continue to be important. Options include:

- Create a mailed or on-line survey (note that other Kentucky water systems have had limited customer response to mailed documents).
- Utility bill insert
- Phone calls for information or to request customer assistance in identifying service line material. Consider going door-to-door when safe.
- Online communication – website and social media
- Information to present to customers:
    - Purpose and need of the service line inventory
    - Dangers of lead
    - Where the service line might be visible in a residence
    - How to do a scratch or magnet test
    - How to submit a photo

Replacement Planning. Water systems that have lead in the distribution system (currently or in the past) will need to develop a replacement plan that includes lead service lines, lead connectors, and galvanized service lines that have ever been downstream from lead. DOW will be developing further guidance on replacement planning in 2023. Water systems that have the means should consider replacing LSLs as they are encountered during the inventory process, especially during field verification. Even if this is not an option, utilities are required to develop a replacement plan as they work on the Service Line Inventory.

Information for the Service Line Inventory*

1. Location information for every service line
   - Address
   - Latitude and longitude (x, y coordinates)
   - Sampling point number, if currently or historically used as a sampling point for compliance
   - Location identifier (optional, but may be required if there are privacy concerns regarding public disclosure of a private, physical address)

2. Material used in every service line (system-owned and customer-owned portions):
   - Lead
   - Galvanized requiring replacement (currently or historically downstream from a LSL)
   - Non-lead (provide specific material where possible)
   - Galvanized not requiring replacement (no history of being downstream of a LSL) or Galvanized Unknown (no information about upstream service line material)
   - Copper
   - Plastic (PVC, HDPE, etc.)
   - Asbestos-cement
   - Unknown (material to be verified later)

3. Date of construction/installation (separate data sets for utility vs. customer section of service line).
   (Note: this date not required to be posted on the Service Line Inventory submitted to DOW).
   - Key date: January 1, 1988 - lead pipe installation was banned in Kentucky. If the exact installation date is unknown, note whether the line was installed before or after January 1, 1988.
   - Any records detailing the last date lead service lines were used

4. List the method(s) used to verify the material of each service line.
   - Previous materials evaluation documents
   - Historical records
   - Construction codes
   - Plumbing codes
   - Permits (construction or plumbing)
   - Distribution system maps and inspections
   - Meter installation records
   - Historical capital improvement plans
   - Historical master plans
   - Inspection records
   - Tap records
   - PVA
   - Historic customer billing data
   - Field inspections
   - Senior staff knowledge (used to narrow search, not as final validation)

5. Type of building (necessary for tap sampling plan)
   - Single family residential
   - Multi-family residential
   - Child-care center
   - Elementary school
   - Middle or high school
   - Business
   - Industrial

6. Other useful information for developing the tap sampling plan (not required for every service line):
   - Gooseneck/connector material (note: The LCRR requires that these be replaced when found during routine work if they are made of lead)
   - Presence of lead solder in service line or premise plumbing
   - Tap sampling results (if service line has been used for lead and copper compliance)

* This is not an all-inclusive list. Water systems may have additional records that can be used to identify service line materials.

Other Important Information

No lead service lines (LSLs) in the distribution system

Water systems that can show a distribution system has no LSLs (for example, those which were built after 1987) must still submit a service line inventory by October 16, 2024. The inventory should list each service line in the distribution system and document that none are LSLs, galvanized requiring replacement, or service lines of unknown material. Under some circumstances, these systems may be exempt from the requirement to submit annual updates to the service line inventory.

Strategy to Identify Unknowns

The Division of Water recognizes that in many cases, water systems will be unable to identify the primary material of every system-owned and customer-owned service line by the compliance date. When developing the initial service line inventory, water systems should design and report a strategy for ongoing identification of service lines during routine operations and include a proposed timeline for completion when submitting their inventory for compliance. Water systems are required by the LCRR to provide a description of how they will continue to update their service line inventory; therefore, they should approach the service line inventory as an ongoing process that will continue after the 2024 deadline. **An initial service line inventory listing all service lines still must be submitted by October 16, 2024.** Any service line with unidentified material will be listed as 'Unknown' in the materials classification portion of the inventory. Any efficiency and organizational processes developed now will be very useful in the long term. Examples include a process to identify service line materials during main line or meter replacements, repair and maintenance operations, and other routine work on the distribution system. DOW strongly encourages establishing an electronic or GIS database to facilitate recording service line materials during routine operations.

Customer Communication

Compared to past rules, the LCRR requires expanded communication with customers about lead, including:

- A statement in the Consumer Confidence Report that a service line inventory has been prepared, and a notice that complete lead tap sampling data are available for review, and information on how to access both;
- Annual notice to, and educational materials for, consumers with known lead lines, galvanized lines that require replacement, *and lines of unknown materials*;
- Notice of any disturbances to known lead, galvanized requiring replacement, and unknown service lines; and,
- Outreach activities for systems with populations greater than 10,000 if the lead service line replacement goal is not met.

Educational materials should focus on including updated health effects language for lead, steps a household can take to reduce exposure to lead, and opportunities for replacement where necessary. Specific details on the public education and communication requirements, including a template for educational materials, can be found at eCFR :: 40 CFR Part 141 Subpart I -- Control of Lead and Copper (40 CFR 141.85).

In addition, as water systems are developing the service line inventories and replacement plans, it will be important to develop clear, ongoing channels of communication with customers to engage their support throughout the process. DOW is currently working to develop customer communication and education resources for water systems to use. Look for these to be available in 2023 on the DOW Compliance webpage.

Further Guidance

Lead and Copper Rule Revisions – eCFR :: 40 CFR Part 141 Subpart I -- Control of Lead and Copper

EPA (2022) Guidance for Developing and Maintaining a Service Line Inventory.

The Lead Service Line Replacement Collaborative is "a joint effort of 28 national public health, water utility, environmental, labor, consumer, housing, and state and local governmental organizations" that provides resources.

Email DOW at DrinkingWaterCompliance@ky.gov.