FACT SHEET

EPA's Final Lead and Copper Rule Improvements Technical Fact Sheet: Tap Monitoring Requirements

October 2024

This fact sheet highlights the changes in the lead and copper tap sampling requirements for community water systems, non-transient non-community water systems, and States under the final Lead and Copper Rule Improvements (LCRI). Tap sampling results can trigger systems to take additional actions to reduce lead and copper exposure, such as reducing the corrosivity of water in a system by installing or re-optimizing optimal corrosion control treatment (OCCT), or through public education.

What are water systems required to do before sampling under the LCRI?

By the start of the first lead and copper tap monitoring period under the LCRI, all water systems must submit an updated sampling plan to their State. The plan must include:

- A pool of tap sampling sites from the highest tier available based on the materials of service lines and connectors (gooseneck or pigtail) in their service line inventory (refer to Table 1).
- A list of water quality parameter (WQP) entry point and distribution system sampling locations.

The State may review and require systems to modify their plan, but States are not required to approve the plan for water systems to use it. However, water systems must collect samples in accordance with the plan.

Where must water systems collect tap samples?

The LCRI revises the tiering criteria to prioritize where tap samples must be collected based on which sampling sites have the greatest likelihood of capturing the highest lead levels at the tap (see Table 1). Tier 1 denotes the highest priority tier and Tier 5 the lowest. Water systems with lead service lines (LSLs) and/or premise plumbing made of lead **must collect all samples** from sites served by LSLs and/or with premise plumbing made of lead (Tiers 1 and 2), if a sufficient number of sites are available (see text box). Systems without LSLs or premise plumbing made of lead must collect samples from sites in the highest available tier.

Water systems do not need to sample from a site in the sample plan after a customer refusal or two outreach attempts with no response from the customer. The number of refusals and non-response from customers must be reported to the State.

Table 1. Revised Tiering Criteria under the Final LCRI

Sample Site Tier	Description
Tier 1	Single-family structures (SFS) with premise plumbing made of lead and/or served by an LSL.
Tier 2	Buildings, including multiple-family residences, with premise plumbing made of lead and/or served by an LSL.
Tier 3	SFS served by a lead connector. SFS served by a galvanized service line or containing galvanized premise plumbing identified as ever having been downstream of an LSL.
Tier 4	SFS that contain copper premise plumbing with lead solder installed before the effective date of the State's applicable lead ban.
Tier 5	SFS or a building in which the plumbing materials used at that site would be commonly found at other sites served by the water system (i.e., representative of sites throughout the

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Sample Site Tier	Description
	distribution system).

What is the sampling protocol under the LCRI?

Tap samples requested by consumers and those collected as follow-up to a single lead result above 0.010 mg/L do not have to follow this sampling protocol.

General Requirements

The LCRI retains the Lead and Copper Rule (LCR) requirement for samples to:

- Be collected from an interior kitchen or bathroom sink cold-water tap for residential buildings or an interior cold-water tap from which water is typically used for human consumption for nonresidential buildings.
- Have stood motionless in the plumbing system and/or service line for at least six hours.

The LCRI requires that:

- Sample collection instructions cannot direct the sample collector to remove or clean the aerator or flush taps prior to the start of the minimum six-hour stagnation period.
- Samples be collected in a wide-mouth bottle that is defined as one liter in volume and has a mouth with an inner diameter of at least 40 millimeters.

Water Systems with Lead Service Lines

Under the final LCRI, water systems with LSLs must collect an additional fifth-liter sample at the same time as the first-liter sample (i.e., first-liter- and fifth-liter-paired sample) at sites served by an LSL. The fifth-liter sample increases the likelihood that samples capture water that has been sitting in contact with LSLs. Both the first- and fifth-liter samples must be analyzed for lead. The first-liter sample is also analyzed for copper when both contaminants are required to be monitored (see "When are samples collected?").

To collect a first-liter- and fifth-liter-paired sample, the sample collector (e.g., water system or consumer) must:

- Fill the first numbered wide-mouth sample bottle with tap water.
- Immediately slide the second bottle under the tap without turning the water off and repeat the process for bottles three through five in consecutive order.

Water Systems with No Lead Service Lines

Water systems without LSLs must follow the "General Requirements" described above, collect a **first-liter sample only** from the highest available tiered site, and analyze the sample for lead and copper where both contaminants are required to be sampled (see "When are samples collected?").

When must samples be collected?

Tap monitoring period and tap sampling period

The **tap monitoring period** determines the frequency that a water system must conduct tap sampling and ranges from six months to nine years. The **tap sampling period** is the time period within the tap monitoring period during which the system must collect the samples. There is one tap sampling period per tap monitoring period.

Systems that must conduct standard monitoring

Standard monitoring consists of six-month *tap monitoring* periods of January - June or July - December.

Beginning January 1, 2028, the following systems must conduct standard monitoring for at least the next two consecutive six-month tap monitoring periods:

- Systems with lead and/or GRR service lines, unless they already follow the LCRI tap sampling protocols prior to the LCRI compliance date. In the latter case, the water system can remain on its existing sampling schedule.
- Systems that exceed the revised lead action level of 0.010 mg/L or copper action level of 1.3 mg/L in their most recent tap monitoring period as of the LCRI compliance date.

In addition, a system must conduct standard monitoring for at least two consecutive six-month monitoring periods at any time if it meets any of the following criteria:

- Exceeds a lead or copper action level.
- Fails to operate at or above the minimum value or within the range of values for the State-designated optimal water quality parameters (OWQPs) for more than nine days in any tap monitoring period.
- Becomes a large water system (i.e., grows to serve more than 50,000 people) and has no corrosion control treatment (CCT).
- Is a large water system, has no CCT, and its 90th percentile lead level exceeds the lead practical quantitation limit (PQL) of 0.005 mg/L.
- Installs or re-optimizes optimal corrosion control treatment (OCCT) or adjusts OCCT following a Distribution System and Site Assessment. Systems must continue standard monitoring until the State designates new OWQPs.
- State has designated new values for OWQPs.
- Installs source water treatment.
- Notifies the State of an upcoming addition of a new source or long-term change in treatment, unless the State does not require more frequent monitoring.
- Has no lead or GRR service lines in its inventory but subsequently discovers such a service line, unless the line(s) are replaced prior to the start of the next tap monitoring period.

Systems that qualify for reduced tap monitoring

Systems on reduced monitoring must sample during the *tap sampling period* of June - September, unless the State has approved a different tap sampling period.

- Water systems can qualify to conduct tap monitoring annually if they do not exceed the lead and copper action levels for two consecutive six-month tap monitoring periods and meet their OWQPs (if applicable). Systems must sample for lead at the **standard number** of sites and for copper at the **reduced number** of sites.
- Water systems can qualify to conduct tap monitoring every three years at the **reduced number of sites** for both lead and copper if they meet their OWQPs (if applicable) and:
  - For systems serving 50,000 or fewer people, they do not exceed the lead and copper action level for three consecutive years.
  - For any water system, their 90th percentile lead and copper levels do not exceed the lead PQL of 0.005 mg/L and copper PQL of 0.65 mg/L, respectively, for two consecutive tap monitoring periods.
- Prior to conducting triennial monitoring, systems must receive a written determination from the State

approving triennial monitoring.

- The LCRI did not modify the provisions for systems serving 3,300 or fewer people to qualify for monitoring every nine years at the reduced number of sites.

How many samples are required?

The final LCRI did not change the minimum number of tap samples that a system must collect (see Table 2).

Table 2. Minimum Number of Required Lead and Copper Samples

System Size (number of people served)	Standard number of sites	Reduced number of sites
≤100	5	5
101 - 500	10	5
501 – 3,300	20	10
3,301 – 10,000	40	20
10,001 – 100,000	60	30
>100,000	100	50

Is sample invalidation allowed under the LCRI?

The LCRI retains the ability for States to invalidate samples from LCRR with some modifications. Under LCRI, States now have the authority to invalidate samples that do not meet the site selection criteria (e.g., when sites of a higher tier were available and were not sampled) and/or the sample collection criteria, including minimum stagnation time.

What samples must be used to calculate the 90th percentile levels?

The 90th percentile levels of a system's lead and copper tap samples are compared against the respective action levels of 0.010 mg/L for lead and 1.3 mg/L for copper. If a system exceeds either of these levels, the system must undertake steps to install or re-optimize OCCT and educate the public. A description of the LCRI modifications to the 90th percentile calculation with examples follows.

Which samples are included in the 90th percentile calculation?

Include: Compliance samples and consumer-requested samples if they are collected from the highest available tier(s) and meet the sampling protocol.

Exclude: Samples collected as follow-up to a single lead result above 0.010 mg/L or after service line replacement.

First, systems must compile eligible sample results for the 90th percentile calculation.

- Samples are eligible to be included if they are: 1) collected according to the LCRI compliance tap sampling protocol; 2) collected during the appropriate tap sampling period; and 3) are from the highest tiers with available samples.
- The highest sample from each site collected during that tap sampling period must be included. For sites with LSLs, only the higher of the first- or fifth-liter sample can be included.

Second, systems must calculate the 90th percentile levels according to the system characteristics below:

Systems with Sufficient Tier 1 and 2 sites

- Tier 1 samples are eligible. Only when Tier 1 sites are exhausted can systems include samples from Tier 2, unless the system has 20% or more of residential sites in Tier 2.

- Samples from Tiers 3 through 5 are not eligible.
- The 90th percentile levels must be calculated using all eligible sample results.

Example: A system with LSLs serves 10,001 people and is required to sample at 60 sites. The system collects samples from 62 Tier 1 and 2 sites and samples from 8 Tier 3 sites. All samples meet the sampling protocol requirements. All available Tier 1 sites are exhausted.

Question: Which samples must be included in the 90th percentile calculation?

Answer:

- *For lead, the higher of the first- or fifth-liter sample result from each of the 62 Tier 1 and 2 sites.*
- *For copper, the first-liter sample results from the 62 Tier 1 and 2 sites.*

Systems with an insufficient number of Tier 1 and 2 sites

- Samples from Tiers 1, 2, and the next highest tier(s) (sufficient to supply enough sites to meet the minimum number of samples required) are eligible. Only when Tier 3 sites are exhausted can systems include samples from Tier 4, and only when Tier 4 is exhausted can systems include samples from Tier 5.
- The 90th percentile level is calculated using the highest results from the eligible samples, equal to the minimum number of samples required (see Table 2).

Example: A system with LSLs serves 10,001 people and is required to sample at 60 sites. The system samples at a total of 65 sites: 50 Tier 1 and 2 sites, 12 Tier 3 sites, and 3 Tier 4 sites. All samples meet the sampling protocol requirements.

Question: Which samples must be included in the 90th percentile calculation?

Answer:

- *Since sites from Tiers 1 through 3 are sufficient to meet the minimum number required, Tier 4 samples are not included.*
- *For lead, the highest 60 samples (the minimum number of required samples) from Tiers 1, 2, and 3. For each Tier 1 and 2 sample, only consider the higher of the first- and fifth-liter sample result.*
- *For copper, the highest 60 first-liter sample results from Tiers 1, 2, and 3.*

Systems with no Tier 1 and Tier 2 sites

- Tier 3 samples are eligible. Only when Tier 3 sites are exhausted can systems include samples from Tier 4, and only when Tier 4 is exhausted can systems include samples from Tier 5.
- The 90th percentile levels for lead and copper must be calculated using all eligible sample results.

Example: A system with no Tier 1 or Tier 2 sites serves 10,001 people and is required to collect 60 samples. The system collects a total of 70 samples: 30 samples from Tier 3 sites and 40 from Tier 4 sites. All samples meet the sampling protocol requirements. All available Tier 3 sites are exhausted.

Question: Which samples are included in the 90th percentile calculation?

Answer:

- *For lead, the first-liter sample results from the 70 Tier 3 and 4 samples.*
- *For copper, the first-liter sample results from the 70 Tier 3 and 4 samples.*

Systems Collecting Five or Fewer Samples

- Systems collecting five samples must use the average of the highest and second highest sample results. This has remained unchanged from the LCR.
- The LCRI clarifies that systems collecting fewer than five samples must use the **sample result with the highest concentration** as their 90th percentile value if they:
    1. Have been approved to collect multiple samples from the same site on different days during the same tap sampling period; or
    2. Failed to collect the required minimum number of samples.