

*Lead and Copper Rule
Short Term Revisions and
Overview*

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Purpose

Established in June 1991 to protect public health by minimizing Lead and Copper levels in drinking water, primarily by reducing water corrosivity.

The benefits of which is the reduction in risk of exposure to lead, which can cause damage to the brain, red blood cells, and kidneys, and copper which can cause stomach and intestinal distress, liver and/or kidney damage, as well as, complications of Wilson's Disease.

Lead and Copper Sampling Requirements

- ◆ Number of sample sites is based on the system's population.
- ◆ Samples must be first draw, 1 liter in volume, at cold water taps, and have stood motionless in the plumbing at each sampling site for at least six hours in homes/buildings that are at most risk based on a Tier criteria.
 - ◆ Systems unable to collect first draw samples based on operational restraints (i.e. continuous operation) may substitute non-first draw samples provided notification is made to the DWS in writing.

Sampling Requirements Con't

System Size (# of People Served)	# of Sites (Standard Monitoring)	# of Sites (Reduced Monitoring)
Greater than 100,000	100	50
10,001 – 100,000	60	30
3,301 – 10,000	40	20
501 – 3,300	20	10
101 – 500	10	5
≤ to 100	5	5

For consecutive systems, the number of sampling sites shall be based on the total population of the consecutive system and the supplier's system.

Tier Criteria

If You Are a CWS	If You Are an NTNC
<p>Tier 1 – sampling sites are single family structure:</p> <ul style="list-style-type: none"> - with copper pipes with lead solder installed after 1982 or contain lead pipes; and/or - that are served by a lead service line. <p>NOTE: When multiple-family residences (MFR) comprise at least 20% of the structures served by a water system, the system may count them as Tier 1 sites.</p>	<p>Tier 1 – sampling sites consist of buildings:</p> <ul style="list-style-type: none"> - with copper pipes with lead solder installed after 1982 or contain lead pipes; and/or - that are served by a lead service line.
<p>Tier 2 – sampling sites consist of buildings, including MFRs:</p> <ul style="list-style-type: none"> - with copper pipes with lead solder installed after 1982 or contain lead pipes; and/or - that are served by a lead service line. 	<p>Tier 2 - sampling sites consist of buildings with copper pipes with lead solder installed before 1983.</p>
<p>Tier 3 – sampling sites are single family structures with copper pipes having lead solder installed before 1983.</p>	<p>Tier 3 – Not applicable.</p>

2007 LCR Revision

- ◆ CFR 141.80c3v - Minimum Number of Samples Required
 - ◆ Clarified and maintained that 5 samples per monitoring period is the minimum number of samples required for systems serving 100 people or fewer.
 - ◆ However, the revision gives the State discretion in allowing certain qualifying systems to collect fewer than 5 samples within a monitoring period. The sample with the highest result would be the sample in which Action Level compliance would be determined.
 - ◆ Qualifying systems would be those with fewer than 5 taps for human consumption, and have been granted permission in writing from the State.

Compliance

- 💧 The Lead and Copper Rule applies to all Community and Non-Transient Non-Community Public Water Systems. Compliance for Lead and Copper is based on an Action Level exceedance. The Action Level for Lead is 0.015 mg/L and 1.3 mg/L for Copper. An exceedance is determined by the 90th percentile of tap water samples.

2007 LCR Revision

- 💧 CFR 141.2 - Definition Clarification;
 - 💧 Compliance Period means a three-year calendar year period within a compliance cycle. (January 1, 2008 to December 31, 2010).
 - 💧 Monitoring Period means the specific period in which water systems must conduct the required monitoring. (CP 1/1/2008 to December 31, 2008; MP June, July, August, September of 2008)

Compliance Con't

- ◆ Standard monitoring is conducted on a 6 month frequency.
- ◆ Systems are eligible for reduced monitoring to an annual frequency if the system meets both action levels during two consecutive 6 month monitoring periods.
- ◆ Systems are eligible for reduced monitoring to a triennial frequency if the system meets both action levels during three consecutive annual monitoring periods.
 - ◆ Those systems on reduced monitoring must collect all samples during the months of June, July, August or September.

Compliance Con't

- 💧 Calculating the 90th percentile result.
 - 💧 For systems collecting more than 5 samples;
 - 💧 Place PB or CU results in ascending order.
 - 💧 Assign each sample a number, 1 for the lowest value.
 - 💧 Multiply the total number of samples by 0.9
 - 💧 Example: 20 samples X 0.9 = 18, so the 18th result is your 90th percentile sample to be compared to the Action Level.

Compliance Con't

- 💧 Calculating 90th percentile result for system that collect 5 samples:
 - 💧 Rank results in ascending order and assign a number to each 1 being the lowest.
 - 💧 Calculate the average of the highest and second highest results. The result of which is then compared to the Action Level.

Compliance Con't

💧 Example: 90th Percentile – 10 lead samples

Site 1: 0.005 mg/L

Site 2: 0.015 mg/L

Site 3: 0.005 mg/L

Site 4: 0.014 mg/L

Site 5: 0.017 mg/L

Site 6: 0.005 mg/L

Site 7: 0.011 mg/L

Site 8: 0.002 mg/L

Site 9: 0.018 mg/L

Site 10: 0.004 mg/L

What is the 90th percentile value?

Compliance Con't

- Order and Rank results from lowest to highest:

No.1 – Site 8 – 0.002 mg/L	No.6 – Site 7 – 0.011 mg/L
No.2 – Site 10 – 0.004 mg/L	No.7 – Site 4 – 0.014 mg/L
No.3 – Site 6 – 0.005 mg/L	No.8 – Site 2 – 0.015 mg/L
No.4 – Site 3 – 0.005 mg/L	No.9 – Site 5 – 0.017 mg/L
No.5 – Site 1 – 0.005 mg/L	No.10 – Site 9 – 0.018 mg/L

Multiply the number of samples by 0.9:

$0.9 \times 10 \text{ samples} = 9$ Therefore, the 9th sample is the 90th percentile result to compare to the Action Level.

No.9 = 0.017 mg/L – Action Level for Lead is 0.015 mg/L

Lead Action Level Exceedance

Compliance Con't

💧 Example: 90th Percentile – 5 copper samples

Site 1: 0.891 mg/L

Site 2: 1.50 mg/L

Site 3: 0.960 mg/L

Site 4: 0.003 mg/L

Site 5: 0.462 mg/L

What is the 90th percentile value?

Compliance Con't

- Order and rank results from lowest to highest:

No.1 – Site 4 – 0.003 mg/L

No.2 – Site 5 – 0.462 mg/L

No.3 – Site 1 – 0.891 mg/L

No.4 – Site 3 – 0.960 mg/L

No.5 – Site 2 – 1.500 mg/L

Average the highest and second highest results:

$$\frac{0.960 \text{ mg/L} + 1.50 \text{ mg/L}}{2} = 1.23 \text{ mg/L}$$

Compare value to Copper Action Level – 1.3 mg/L

Copper Action Level Compliance Achieved

Action Level Exceedance

- ◆ An exceedance of either action level triggers additional requirements:
 - ◆ Water Quality Parameters Monitoring
 - ◆ Source Water Monitoring/Treatment
 - ◆ Lead Public Education (lead exceedance only)
 - ◆ Tier 2 Copper Public Notification
 - ◆ Corrosion Control Treatment Evaluation and Installation
 - ◆ Lead Service Line Monitoring and/or Replacement (repeated lead exceedance after treatment installation)

Water Quality Parameters (WQPs)

- 🔥 Required by all systems which exceed either Lead or Copper Action Levels and for those systems who serve >50,000
- 🔥 Used to determine water corrosivity and aide in determining Corrosion Control evaluation
- 🔥 Parameters include pH, Alkalinity, Calcium, Conductivity, orthophosphate, silica, and temperature.

Water Quality Parameters (Con't)

- ◆ Number of samples is determined by population served.
- ◆ Samples are collected in the distribution system as well as each entry point.
- ◆ WQPs required as a result of an ALE must be collected during the same monitoring period in which the exceedance occurred. For example, if a system is conducting PB/CU sampling on an annual or triennial frequency and exceeds either Action Level, WQPs must be collected before September 30th of that monitoring period.

Source Water Monitoring

- ◆ Required by all systems that exceed either Action Level
- ◆ System shall conduct Lead and Copper monitoring at each entry point within six months of the end of the monitoring period in which the exceedance occurs
 - ◆ Based on the results, the State may require source water treatment in which the system would have 24 months to install. The State may also set maximum permissible levels for source water lead and copper

Lead Public Education

- ◆ Required for all systems that have incurred a Lead Action Level Exceedance.
- ◆ Educates customers about the health effects of lead and how to reduce exposure.
- ◆ Lead education materials must be delivered within 60 days of the monitoring period in which the exceedance occurred. Distribution of materials is an annual requirement, although may be discontinued once Action Level compliance is achieved through the most recent 6-month monitoring period.

2007 LCR Revision

- ◆ CFR 141.85 - Public Education Requirements
 - ◆ Revisions made in the areas of message content, delivery requirements, and Consumer Confidence Report.
 - ◆ Message content revised to make it shorter and easier to understand.
 - ◆ Delivery requirements revised to deliver materials to new organizations, engage in new outreach activities, post lead info on water bills, issue two press releases during periods of lead action level exceedances.
 - ◆ Modify the CCR such that all systems would have to include info regarding the risks of lead in drinking water in their CCRs on a regular basis.

2007 LCR Revision

- ◆ CFR 141.85 (d) – Requirements to provide a consumer notice of Lead tap water monitoring results to consumers who occupy homes or buildings that are tested for Lead.
 - ◆ Systems must provide written notification to household occupants within 30 days after PWS learns of the results collected at those locations, and post or otherwise notify occupants of non-residential buildings of the results of lead testing.
 - ◆ Notification must include an explanation of lead health effects, steps consumers can take to reduce exposure, utility contact info, and the Lead Action Level.
 - ◆ Within 3 months following the end of the monitoring period, systems must submit a sample copy of the notification and a certification that the system met the delivery requirements to the State.

Copper Public Notification

- ◆ Required for systems that exceed the Copper Action Level.
- ◆ Tier 2 – The system shall notify consumers of the concentration no later than 30 days after the system learns of the exceedance.
- ◆ A copy of the notice and certification must be submitted to the DWS.
- ◆ The Public Notification must be repeated every three months for as long as the exceedance exists. If the notice is posted, it must remain in place until the situation is resolved but, for no less than 7 days. The system is also required to submit certification of delivery or posting during these situations.

Corrosion Control Treatment

- 🔥 Required of all systems who exceed either Action Level.
- 🔥 PWS is required to submit a treatment proposal within 6 months of the end of the monitoring period in which the exceedance occurred.
 - 🔥 A proposal must include treatment beyond existing treatment, maintenance of existing treatment, fixture replacement, etc.

Corrosion Control (Con't)

- Once a proposal has been received and accepted, the PWS will have 24 months from the end of the exceedance period to submit plans, specifications, a general application form, and obtain DWS approval prior to installation.
- Once installation is complete, follow up Lead and Copper tap monitoring is required for two consecutive 6 month monitoring periods.
- Tap water monitoring during the Corrosion Control Treatment Steps is not required until the previous step is reached, however tap monitoring on a 6 month frequency is suggested. If a system is able to achieve two consecutive 6-month monitoring periods in which both the Lead and Copper Action Levels are met, the system can halt all CCTS, and reduce their monitoring frequency to annual.

Lead Service Line Replacement

- 💧 If a system continues to exceed the Action Level after CCT or SWT installation, the system must proceed with Lead Service Line Replacement/Monitoring.
 - 💧 LSL Replacement – System must replace 7% of LSLs per year that contribute more than 0.015 mg/L of Lead to the system's tap water levels.

Lead Service Line Replacement (Con't)

- 💧 If only a portion of the LSL is replaced, the PWS must:
 - 💧 Notify customers served by LSL being replaced about the potential for increased Lead levels at least 45 days prior to replacement.
 - 💧 Collect samples within 72 hours of replacement and mail/post results within 3 days of receipt of results.

Lead Service Line Replacement (Con't)

- ◆ Lead Service Line Monitoring – Two types associated with LSL Replacement:
 - ◆ Optional – Monitoring from LSL to determine need for replacement. If all Lead samples from the line are ≤ 0.015 mg/L then the LSL does not need to be replaced and also then is considered replaced and can be included in the 7% annual replacement requirement.
 - ◆ Required – Monitoring when partial LSL replacement occurs. Sample collected must be representative of water in partially replaced line.

Lead Service Line Replacement (Con't)

- 💧 Systems can discontinue Lead Service Line Replacement whenever Lead Action Level compliance is achieved for two consecutive 6-month monitoring periods of tap samples.

2007 LCR Revision

- ☛ CFR 141.84 (b)(2) – Reevaluation of lead service lines deemed replaced through testing.
 - ☛ Requires systems to reevaluate lead service lines classified as “replaced through testing” if resuming LSLR program.
 - ☛ Applies to systems that had initiated a lead service line replacement program, discontinued the program, and subsequently resumed the program.

2007 LCR Revision

- 💧 CFR 141.81 – Advanced Notification and Approval Requirements for Systems that intend to make any long-term change in water treatment or add a new source.
 - 💧 Mainly revised to prevent water systems from notifying the State and requesting approval for changes that are operational in nature or are made on a daily basis.
 - 💧 EPA has provided examples of long-term changes in CFR 141.90(a)(3)



Additional Information

- Department of Public Health Website
ct.gov/dph
- Environmental Protection Agency: Lead in
Drinking Water

<http://www.epa.gov/OGWDW/lead/index.html>

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