

# Lead and Copper Rule: A Quick Reference Guide

Overview of the Rule	
Title <sup>1</sup>	Lead and Copper Rule (LCR) <sup>2</sup> , 56 FR 26460 - 26564, June 7, 1991
Purpose	Protect public health by minimizing lead (Pb) and copper (Cu) levels in drinking water, primarily by reducing water corrosivity. Pb and Cu enter drinking water mainly from corrosion of Pb and Cu containing plumbing materials.
General Description	Establishes action level (AL) of 0.015 mg/L for Pb and 1.3 mg/L for Cu based on 90 <sup>th</sup> percentile level of tap water samples. An AL exceedance is not a violation but can trigger other requirements that include water quality parameter (WQP) monitoring, corrosion control treatment (CCT), source water monitoring/treatment, public education, and lead service line replacement (LSLR).
Utilities Covered	All community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) are subject to the LCR requirements.

Public Health Benefits	
Implementation of the LCR has resulted in	<ul style="list-style-type: none"> <li>▶ Reduction in risk of exposure to Pb that can cause damage to brain, red blood cells, and kidneys, especially for young children and pregnant women.</li> <li>▶ Reduction in risk of exposure to Cu that can cause stomach and intestinal distress, liver or kidney damage, and complications of Wilson's disease in genetically predisposed people.</li> </ul>

Major Monitoring Provisions	
Lead and Copper Tap	
Applicability	▶ All CWSs and NTNCWSs.
Standard	<ul style="list-style-type: none"> <li>▶ CWSs and NTNCWSs must collect first-draw samples at taps in homes/buildings that are at high risk of Pb/Cu contamination as identified in 40 CFR 141.86(a).</li> <li>▶ Number of samples is based on system size (see Table 1).</li> <li>▶ Systems must conduct monitoring every 6 months unless they qualify for reduced monitoring.</li> </ul>
Reduced	▶ See Table 1 for sample number and Table 2 for criteria.

Water Quality Parameter (WQP)	
Applicability	<ul style="list-style-type: none"> <li>▶ Systems serving &gt; 50,000 people.</li> <li>▶ Systems serving ≤ 50,000 during monitoring periods in which either AL is exceeded.</li> </ul>
Standard	<ul style="list-style-type: none"> <li>▶ WQP samples at taps are collected every 6 months.</li> <li>▶ WQPs at entry points to distribution system (EPTDS) are collected every 6 months prior to CCT installation, then every 2 weeks.</li> </ul>
Reduced	▶ See Table 1 for sample number and page 2 for criteria. Does not apply to EPTDS WQP monitoring.

Table 1: Lead and Copper Tap and WQP Tap Monitoring

Size Category	System Size	Number of Pb/Cu Tap Sample Sites <sup>3</sup>		Number of WQP Tap Sample Sites <sup>4</sup>	
		Standard	Reduced	Standard	Reduced
Large	> 100K	100	50	25	10
	50,001 - 100K	60	30	10	7
Medium	10,001 - 50K	60	30	10	7
	3,301 - 10K	40	20	3	3
Small	501 - 3,300	20	10	2	2
	101 - 500	10	5	1	1
	≤ 100	5	5	1	1

<sup>3</sup> With written State approval, PWSs can collect < 5 samples if all taps used for human consumption are sampled.

<sup>4</sup> Two WQP tap samples are collected at each sampling site.

Table 2: Criteria for Reduced Pb/Cu Tap Monitoring

Annual	<ol style="list-style-type: none"> <li>1. PWS serves ≤ 50,000 people and is ≤ both ALs for 2 consecutive 6-month monitoring periods; or</li> <li>2. Any PWS that meets optimal WQPs (OWQPs) and is ≤ Pb AL for 2 consecutive 6-month monitoring periods.</li> </ol>
Triennial	<ol style="list-style-type: none"> <li>1. PWS serves ≤ 50,000 people and is ≤ both ALs for 3 consecutive years of monitoring; or</li> <li>2. Any PWS that meets OWQP specifications and is ≤ Pb AL for 3 consecutive years of monitoring; or</li> <li>3. Any PWS with 90<sup>th</sup> percentile Pb and Cu levels ≤ 0.005 mg/L and ≤ 0.65 mg/L, respectively, for 2 consecutive 6-month monitoring periods (i.e., accelerated reduced Pb/Cu tap monitoring).</li> </ol>
Every 9 years	PWS serves ≤ 3,300 people and meets monitoring waiver criteria found at 40 CFR 141.86(g).

Lead Consumer Notice	
Within 30 days of learning the results, all systems must provide individual Pb tap results to people who receive water from sites that were sampled, regardless of whether the results exceed the Pb AL, as required by 40 CFR 141.85(d).	
Consumer Confidence Report (CCR)	
All CWSs, irrespective of their lead levels, must provide an educational statement about lead in drinking water in their CCRs as required by 40 CFR 141.154. Must be in 2008 CCR (due July 1, 2009) if EPA is Primacy Agency, State adopts the rule by reference automatically, or adopts during 2008. Otherwise, this statement is required in the 2009 CCR (due July 1, 2010).	

<sup>1</sup>This document provides a summary of federal drinking water requirements; to ensure full compliance, please consult the federal regulations at 40 CFR 141 and any approved state requirements.

<sup>2</sup> The June 1991 LCR was revised with the following Technical Amendments: 56 FR 32112, July 15, 1991; 57 FR 28785, June 29, 1992; 59 FR 33860, June 30, 1994.

It was subsequently revised by: the LCR Minor Revisions, 65 FR 1950, January 12, 2000; and the LCR Short-Term Revisions, 72 FR 57782, October 10, 2007.



## Treatment Technique and Sampling Requirements if the AL is Exceeded<sup>5</sup>

<sup>5</sup> Based on 90<sup>th</sup> percentile level. Multiply number of valid samples by 0.9 (e.g., 10 samples x 0.9 = 9; thus, use 9<sup>th</sup> highest Pb and Cu test result to compare to AL). For 5 samples, average 4<sup>th</sup> and 5<sup>th</sup> highest results. For < 5 samples, use highest result.

### Water Quality Parameter (WQP)

Applicability	Refer to page 1.
Parameters	<ul style="list-style-type: none"> <li>▶ pH, alkalinity, calcium (<i>initial only, unless calcium carbonate stabilization is used</i>), conductivity (<i>initial monitoring only</i>), orthophosphate (<i>if inhibitor is phosphate-based</i>); silica (<i>if inhibitor is silicate-based</i>), and temperature (<i>initial monitoring only</i>).</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>▶ Systems installing CCT, must conduct follow-up monitoring for 2 consecutive 6-month periods.</li> <li>▶ WQP tap monitoring is conducted every 6 months, EPTDS monitoring increases to every 2 weeks.</li> <li>▶ After follow-up monitoring, State sets OWQP specifications that define optimal CCT.</li> </ul>
Reduced Tap Monitoring	<ul style="list-style-type: none"> <li>▶ Collect reduced number of sampling sites (see Table 1) if meet OWQPs for 2 consecutive 6-month periods.</li> <li>▶ Collect reduced number of sampling sites at reduced frequency if meet OWQPs for:               <ul style="list-style-type: none"> <li>- 6 consecutive 6-month monitoring periods can monitor annually;</li> <li>- 3 consecutive years of annual monitoring can monitor triennially.</li> </ul> </li> </ul>

### Public Education (PE)

Applicability	▶ Systems that exceed the Pb AL ( <i>not required if only the Cu AL is exceeded</i> ).
Purpose	▶ Educates consumers about lead health effects, sources, and steps to minimize exposure.
Delivery Method	<ul style="list-style-type: none"> <li>▶ CWSs: deliver materials to bill-paying customers and post lead information on water bills, work in concert with local health agencies to reach at-risk populations (children, pregnant woman), deliver to other organizations serving "at-risk" populations, provide press releases, include new outreach activities from list in 40 CFR 141.85(a)(2)(vi), and post to Web site (CWSs serving &gt; 100,000 only).</li> <li>▶ NTNCWSs: posting and distribution to all consumers (can be electronic with State permission). Can apply to CWSs such as hospitals and prisons where population cannot make improvements.</li> </ul>
Timing	<ul style="list-style-type: none"> <li>▶ Within 60 days <i>after end of monitoring period</i> in which Pb AL was exceeded if not already delivering PE.<sup>6</sup></li> <li>▶ Repeat annually except: water bill inserts - quarterly; press releases - 2x/year, and Web posting - continuous.</li> <li>▶ Can discontinue whenever ≤ Pb AL but must recommence if subsequently exceed Pb AL.</li> </ul>

<sup>6</sup>State may allow extension in some situations. Also, State may require approval of message content prior to delivery.

### Source Water Monitoring and Source Water Treatment (SOWT)

Applicability	▶ Systems that exceed Pb or Cu AL.
Purpose	▶ Determine contribution from source water to total tap water Pb and Cu levels and need for SOWT.
Timing	<ul style="list-style-type: none"> <li>▶ One set of samples at each EPTDS is due within 6 months of first AL exceedance.</li> <li>▶ System has 24 months to install any required SOWT.</li> <li>▶ State sets maximum permissible levels (MPLs) for Pb and Cu in source water based on initial and follow-up source water monitoring.</li> </ul>
Standard	▶ Ground water PWSs monitor once during 3-year compliance periods; surface water PWSs monitor annually.
Reduced	▶ Monitor every 9 years if MPLs are not exceeded during 3 consecutive compliance periods for ground water PWSs or 3 consecutive years for surface water PWSs.

### Corrosion Control Treatment (CCT)

Applicability	<ul style="list-style-type: none"> <li>▶ All large systems except those meeting requirements of 40 CFR 141.81(b)(2) or (b)(3).</li> <li>▶ Medium and small systems that exceed either AL; may stop CCT steps if ≤ both ALs for 2 consecutive 6-month periods but must recommence CCT if subsequently exceed either AL.</li> </ul>
Study	<ul style="list-style-type: none"> <li>▶ All large systems except as noted above.</li> <li>▶ If State requires study for small or medium systems, it must be completed within 18 months.</li> </ul>
Treatment	<ul style="list-style-type: none"> <li>▶ Once State determines type of CCT to be installed, PWS has 24 months to install.</li> <li>▶ Systems installing CCT must conduct 2 consecutive 6 months of follow-up tap and WQP monitoring.</li> </ul>
OWQPs	▶ After follow-up Pb/Cu tap and WQP monitoring, State sets OWQPs. <i>Refer to WQP section above.</i>

### Lead Service Line Replacement (LSLR)

Applicability	<ul style="list-style-type: none"> <li>▶ Systems that continue to exceed the Pb AL after installing CCT and/or SOWT.</li> <li>▶ Can discontinue LSLR whenever ≤ Pb AL in tap samples for 2 consecutive 6-month monitoring periods; must recommence if subsequently exceed.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>▶ Optional: Sample from LSL to determine if line must be replaced. If all samples are ≤ 0.015 mg/L, line is considered "replaced through testing"; must reconsider these lines if Pb AL is subsequently exceeded.</li> <li>▶ Required: Sample from any LSLs not completely replaced to determine impact on Pb levels.</li> </ul>
Replacement	<ul style="list-style-type: none"> <li>▶ Must replace at least 7% of LSLs annually; State can require accelerated schedule.</li> <li>▶ If only portion of LSL is replaced, PWS must:               <ul style="list-style-type: none"> <li>- Notify customers at least 45 days prior to replacement about potential for increased Pb levels.</li> <li>- Collect samples within 72 hours of replacement and provide results within 3 days of receipt.</li> </ul> </li> </ul>

For additional information on the LCR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA Web site at <http://water.epa.gov/drink>; or contact your State drinking water representative.