Distribution System Materials Inventory and
Lead and Copper Tap Sampling Pool

Distribution System Materials Inventory

The original Lead and Copper Rule (LCR) required each impacted water supply (WS) to complete a materials evaluation of its distribution system and use the results to select proper sampling sites for LCR tap monitoring. Much has changed in the approximately 25 years since the original evaluations were conducted, therefore comprehensive review and updates are a high priority. Also note the LCR does not currently require distribution materials evaluations be submitted to the state.

Recommendations: To ensure distribution system components and service lines are properly identified and effectively inventoried, materials evaluations should be re-assessed and updated as needed.

- Within 3 months of effective date, WS must assess the accuracy of existing materials evaluation.
- Within 18 months of effective date, WS must complete and submit a final materials evaluation. WS shall submit the materials evaluation to the State in a form and manner specified by the State. Initial format may require an evaluation summary and certification; long-term may require additional detail and potential submittal to centralized data system, as a component of an asset management plan.
- Service line components of the materials inventory must be updated and submitted to the State quarterly until all LSLs are removed. Once no LSLs remain, the supply must submit an updated inventory, or certification that no changes have occurred, every five years. WS may incorporate updates into asset management and/or general plan updates.
- The water supply shall make information available to the public. For system serving >10,000, summary information shall be made available on WS website; owner-specific information shall be made available upon request.

Tap Sampling Pool

As stated above, the LCR requires each WS use their materials evaluation to identify a pool of sampling sites for lead and copper tap monitoring. A sufficient number of sites must be identified to meet minimum monitoring requirements, and sites must be selected using mandatory site selection criteria to ensure they represent high-risk locations. The LCR does not currently require sampling pools be submitted to the State.

Recommendations: To ensure proper sample site selection, sampling pools should be re-assessed and updated as necessary.

- Within 3 months of the effective date, WS shall assess the accuracy of existing sampling pool.
- Within 12 months of the effective date, WS shall complete and submit to the State an updated sampling pool, which includes at least as many sites as required under standard monitoring. WS shall submit the sampling pool to the State in a form and manner specified by the State.
- Sampling pool shall include rationale for site selection to demonstrate proper selection criteria were considered.
- WS may add new sites to the sampling pool when sites meeting selection criteria are available. WS must remove sites if they no longer meet selection criteria. Updates to sampling pool must be submitted to the State, including rationale for addition or removal of sites.

Lead Service Line Replacement

Lead Service Line Replacement

The LCR currently requires lead service lines (LSL) be replaced when a water supply (WS) continues to exceed the lead action level after installing corrosion control treatment. Under this requirement, WS must replace LSL at a rate of 7% per year as long as they are exceeding the action level. No other WS are required to replace LSL under the current rule. Efforts to remove lead from drinking water should be expanded to require removal of lead from service lines.

Recommendations: Remove all LSL (full, partial, pigtail/gooseneck), as well as galvanized service lines if connected to lead piping/goosenecks.

- Following completion of a final distribution system materials evaluation, require LSL replacement according to the following schedule:

Number of full or partial LSL	Period to Complete
5,000 or fewer	5 years
5,001 to 10,000	10 years
10,001 or more	15 years (or a longer period if approved by the State)

- If homeowner portion is lead or galvanized following lead components, the WS must offer to replace homeowner portion at WS expense.

Partial Lead Service Line Replacement

Recent studies have demonstrated that partial lead service line replacement can cause service line disruption that may increase exposure to lead (at least in the short-term). Partial LSL replacement should be avoided.

Recommendations: Prohibit partial LSL, unless an exception granted by the State.

- Prohibit partial lead service line replacements that do not remove all lead components and any galvanized piping that is connected to lead components.
- Allow exceptions (unless prohibited by future EPA rules) only in cases of emergency repair or when homeowner declines consent to replace homeowner portion. In cases of exception, WS must conduct **robust** mitigation activities. Details to be specified, but may include activities such as filters, flushing protocols, expanded sampling and resident education, etc.

Sample Site Selection &
Sampling Procedures

Lead and Copper Tap Sample Site Selection Criteria

LCR sample site selection criteria are intended to identify and sample from sites considered high-risk for contamination. Over the years, there have been federal and state clarifications to site selection criteria that should be included in regulatory updates.

Recommendations: Update site selection criteria to address recent guidance.

- Clarify that a WS with LSLs shall draw at least 50% (not limited to only 50%) of its samples from sites with LSL.
- Clarify that service lines with lead goosenecks or pigtails are considered Tier 1 sites.
- Specify that within Tier 1 sites, the following conditions should be given priority in site selection:
  - Full LSL, giving longer LSL preference
  - Partial LSL, particularly sites with galvanized service lines after lead components
  - Lead pigtail, gooseneck or other fitting
- If multiple, valid compliance samples are collected from the same site during a monitoring period, only the highest value will be included in the action level calculation. (?)
- Investigate removal of tiering criteria that gives preference to sites with copper plumbing with lead solder installed between 1983 and 1988.

Lead and Copper Tap Sampling Procedures

Sampling procedures required under the current LCR are challenging and, in some cases, do not address all that has been learned about how sampling techniques impact results. Recent guidance and lessons-learned should be included in regulatory updates.

Recommendations: Clarify and enhance required sampling procedures.

- For sample sites with LSL, require both a first-draw sample, followed by a second sample collected after up to 6 liters have been drawn through the tap. The highest level will be used in the 90th percentile calculation. Sample sites without LSL are only required to collect one first-draw sample as currently required by rule.
- Prohibit pre-stagnation flushing (to be defined in rule) within 7 days prior to sampling.
- Prohibit aerator cleaning within 7 days prior to sampling.
- Require use of wide-mouth sampling bottles.
- Continue to require existing sampling procedures, including:
  - At least 6 hours stagnation,
  - Collected in 1 liter bottles,
  - Acidification within 14 days of collection,
  - Collection from cold water kitchen or bath tap (residential) or interior tap typically used for consumption (non-residential)
  - Not be taken after point of use/entry treatment devices designed to remove inorganic contaminants.

Lead and Copper Tap Sampling
Number of Sites and Frequency

Lead and Copper Tap Sampling – Sites and Frequency

The current LCR allows water supplies (WS) with two 6-month rounds of sampling below both lead and copper action levels (AL), to reduce to annual monitoring and to reduce the number of sites sampled. After 3 annual rounds below the ALs, WS may further reduce to once per 3 years. The rule also allows reduction to 9 years under certain conditions, but the MDEQ has never exercised this option. Annual and triennial sampling is conducted during warm weather months (June through September).

Some proposals suggest WS should remain on annual monitoring and not allow a reduction in the number of sites sampled. Other stakeholders suggest basing the ability to reduce monitoring on whether the WS has experienced difficulty meeting ALs. Some utilities report difficulty finding households willing to participate in sampling and are concerned that requiring more frequent sampling at more sites will be difficult to sustain and may result in "sampling fatigue" among those willing to participate.

Recommendations: Require large supplies (>50,000) and/or those with corrosion control treatment (CCT), to remain on annual monitoring (no reduction to 3 years).

- Require large WS and/or those employing CCT to remain on annual monitoring. It is important to conduct sufficient monitoring to assess effectiveness of corrosion control efforts and address potential issues in a timely manner.
- Expand water quality parameter monitoring requirements at systems with CCT. See CCT recommendations for more detail.
- While not a rule revision, it should be noted that many consecutive water systems (sellers and wholesale customers), have sampled under an EPA-approved consecutive monitoring approach for LCR. This consecutive monitoring approach will likely be eliminated in the near future (timing TBD).

Lead Action and Advisory Levels

Lead Action Level

An action level is not the same as an MCL. An MCL is based on health effects; whereas an action level is a screening tool for determining when certain treatment technique actions are needed. The LCR action level is based on the practical feasibility of reducing lead through controlling corrosion. The current LCR sets the Lead Action Level (LAL) at a 90th percentile value of 0.015 mg/L (15 ppb). An exceedance of the LAL requires various actions be taken by the water supply.

Recommendations: Lower the LAL from 0.015 mg/L to 0.010 mg/L.

- Lower the LAL to 0.010 mg/L, effective 1/1/2021.

Household Advisory Level

The current LCR contains no site-specific level at which action should be taken to reduce lead exposure. While the current rule does require residents at all sites sampled be provided lead consumer notice information, it does not prioritize timing or content.

Recommendations: Establish a level at which households receive a more rapid response and are provided assistance in identifying and reducing lead exposure.

- Establish a Household Advisory Level (HAL) of 0.040 mg/L (40 ppb).
- If an individual sample exceeds the HAL, the follow should occur:
    - The owner/occupants of the household shall be provided lead consumer notice information within 3 business days (rather than 30 days as currently required).
    - Consumer notice information shall be enhanced to include information on how the occupant can request blood testing and/or an assessment of potential sources of lead in drinking water (household plumbing assessment).
    - Notification shall also be provided to the State and LHD within 3 business days.
    - MDEQ shall refer results exceeding the HAL to DHHS for escalated response.

Transparency and Public Information

Water System Advisory Councils (WSAC)

While the current LCR includes lead consumer notification, public education, and consumer confidence reporting requirements, these communications methods could be expanded to further educate consumers on the risks of lead and the shared responsibility of reducing lead exposure.

Recommendations: Establish Water System Advisory Councils per the following:

- Require individual water supplies and consecutive systems (sum population of sellers and customers) that serve greater than 50,000, to establish a WSAC or demonstrate that an existing community council meets membership/purpose criteria. Councils should:
  - Consist of at least 5 members representative of the community, serving X year terms, select a chair, and meet at least X times per year per Open Meeting Act.
  - Advise and consult with WS on implementation of the SDWA, and work with WS to ensure community involvement and transparency.
  - Develop a lead public awareness campaign, regardless of whether the action level is exceeded. A lead awareness campaign should include information on risks of lead, sources of lead, availability of lead-free fixtures, medical assistance information, unpredictability of lead release, and be tailored to meet community needs.
- Establish a statewide Advisory Council to provide services as described above. Provide public education campaign plans and materials to WSs without councils and provide support to large system WSACs. Require WS to distribute materials produced by the WASC.

Consumer Notice of Lead

The current LCR requires WS to provide consumer notice of lead results to each home sampled within 30 days of receiving the result. This notice does not require inclusion of copper results.

Recommendations: Expand notice requirements and reduce timeframe for delivery in select cases.

- Expand consumer notice requirements to include copper results.
- If a sample exceeds the HAL of 0.040 mg/L for lead, provide consumer notice within 3 business days (rather than 30 days as currently required).
- Require a lead compliance statement, including the most recent lead 90th percentile and any violations of LCR requirements, in billing statements.

Public Education

The LCR currently requires WS with a lead action level exceedance to deliver public education materials, meeting content and delivery requirements, to water customers within 60 days after the end of the monitoring period.

Recommendations: Expedite public notification of a lead action level exceedance. Clarify and expand content of public education materials.

- Note: A March 2017 amendment to Act 399 Sec. 325.1019 requires WS to issue public advisory within 3 business days of notification of a lead action level exceedance, followed by remaining PE requirements as currently required by rule.
- Reduce deadline for public education to 30 days from date of notification of lead ALE, but not later than 60 days after the end of the monitoring period.
- Require public education be posted on the supply's website if the WS serves >10,000 people (current rule requires this for WS serving >100,000).

Water Quality Parameter Monitoring and Corrosion Control Treatment

Water Quality Parameter (WQP) Monitoring

The current LCR requires ongoing entry point and distribution WQP monitoring for large water supplies with OCCT. These supplies must also operate within designated WQP ranges to ensure optimal levels are maintained. Small and medium supplies with OCCT are only required to monitor WQP during monitoring periods when an action level is exceeded.

Results of WQP monitoring are used to assess water corrosivity using methods such as the Langelier Saturation Index. Another indicator is the Chloride Sulfate Mass Ratio (CSMR). The current LCR does not require chloride or sulfate monitoring, therefore the CSMR method has not been widely used until recently.

Recommendations: Expand LCR WQP monitoring to include chloride and sulfate, to allow evaluation of the CSMR. Require more robust ongoing WQP monitoring at all WS employing OCCT and ensure WS are operating within designated ranges.

- Expand WQP monitoring to include chloride and sulfate.
- Require WQP monitoring for all water supplies employing optimal corrosion control treatment (OCCT). No exclusion for small/medium supplies with OCCT, regardless of action level.
- Establish and enforce WQP ranges at both entry point and distribution for all WS with OCCT.

Corrosion Control Treatment

The current LCR is does not clearly specify what constitutes a new versus existing water supply for purposes of maintaining OCCT. The current LCR also allows a substantial amount of time to evaluate, recommend, approve, and install OCCT.

Recommendations: Clarify what constitutes a new versus existing WS for the purposes of maintaining OCCT. Consider reducing time allowed to employ OCCT after an AL exceedance.

- Clarify that a water supply receiving the benefit of OCCT (for example, a customer water supply), must maintain OCCT if/when undergoing a change in source or treatment.
- Consider condensing time allowed for a WS to conduct a CCT study and install treatment.