

## **LEAD AND COPPER IN THE WATER SUPPLY SUMMARY**

### **LEAD & COPPER RULE ESTABLISHED:**

The Lead and Copper Rule was originally published in 1991 and has been modified several times. It created action levels for lead of .015 mg/L and for copper of 1.3 mg/L which, when exceeded, indicates the need for corrosion control and lead line replacement. Before this rule was implemented, the maximum containment level was 50 mg/L at the point of entry into the water system. There has been confusion in the units that the test results are reported in. Since one liter of water weighs exactly one kilogram which equals one million milligrams, we report in parts per million or mg/L. The US Environmental Protection Agency often expresses small levels in parts per million or micrograms (ug/L) which can give the impression a sample was 1,000 times more potent - which is misleading.

### **SAMPLING PARAMETERS:**

One-liter samples must be drawn after water has sat motionless at least six hours in the plumbing of the structure on the approved testing site list. Samples are based on population size and are reduced by fifty percent when the water system is in reduced monitoring. By totaling, sample results from each residential test location, the 90<sup>th</sup> percentile for a water system is established. If more than ten percent of samples are above the action level, the state may require a corrosion control study. Samples are required every six months until the levels are sufficient to reduce monitoring. Two consecutive six-month test results below action levels allow for yearly testing, and three consecutive yearly tests below action levels allow testing every three years, which is the minimum allowed. Reducing monitoring is also allowed after two consecutive six-month samples below .005 mg/L for lead and below .65 mg/L for copper. The cooperation of residents is critical as the sample must not be drawn from a point of entry that has a treatment device connected, and each sample has only a fourteen-day shelf life.

### **SAMPLE SITE SELECTION:**

Sites are selected after researching every record available to establish the location of lead, copper, and galvanized steel in the water system. Tier one sample sites must be single-family structures that contain copper pipes with lead solder installed or built after 1982 or that have lead in their plumbing systems or have the greatest possibility of having lead in their plumbing systems. These are homes built typically before 1930. The sample site plan is to be reviewed and corrected if needed before each sample set. The Eureka Springs Lead and Copper Sample Site Plan was researched and expanded in 2017 to identify the most likely high lead and copper concentrations. We added thirty additional sites and approved that site can never be removed from the site plan.



### **CORROSION CONTROL STUDY:**

If sampling determines a corrosion control study is required it must evaluate the efficiencies of the following treatments: alkalinity and pH adjustments, calcium hardness adjustments, and the addition of a phosphate or silicate-based corrosion inhibitor at a sufficient level to maintain an effective residual in all test tap sample sites. A corrosion control study must include the test of required water quality parameters before selecting a treatment option.

### **OUR ONGOING CONCERN:**

The City of Eureka Springs had exceeded the action level for lead in 2006 and was in increased monitoring. We began a lead service line replacement program after identifying that a number of lead service lines from our mains to residential meters existed on Ridgeway and Linwood streets. We replaced every identified lead line in the area and requested that property owners flush their lines and then determine if their plumbing contained any lead. The consecutive tests were below action levels, and we have been on a reduced three-year monitoring period since. We increased public education through articles by Becky Gillette in the Independent, placed educational information on our City website, and continued to replace lead service lines when identified.

The City of Eureka Springs concerns over lead levels predates the Flint Michigan lead disaster of 2014. When we were informed that the State of Arkansas was considering fluoride as an additive to water supplies, our concern became vocal opposition to this consideration. The Cities of Eureka Springs, Hot Springs, and Fort Smith were allowed to testify at the hearings on fluoride at the Arkansas Department of Health, however, our vocal opposition was to no avail. We worked with Olsen Engineering researching the effects the addition of fluoride would have to increase the corrosion factor of our water system. Eureka Springs is by far the oldest water system in the Carroll Boone District. The study, while raising real concerns, was not enough to modify state requirements. Since the Department of Health does not consider that the addition of fluoride changes water parameters, additional testing was not required after the injection of fluoride began. We again presented articles in the Independent newspaper and contacted the schools in our community and made them aware of the situation. Eureka Springs was the only city in the state that requested and received permission to run extra lead and copper samples after the addition of fluoride. The lead and copper tests conducted in the fall of 2018 were extremely close but still below the action level of 0.015 ppm. By this time the City of Harrison exceeded lead test parameters to the extent they were ordered to start a corrosion control study which resulted in the injection of ortho-phosphates to the water supply by the City of Harrison.



YEAR	LEAD - Part Per Million	ACTION LEVEL THRESHOLD	
2006	0.032 ppm	0.015 ppm	AR Dept. of Health placed Eureka Springs in increased monitoring status.
2007	Not on file	0.015 ppm	Eureka Springs in increased mandatory accelerated lead testing imposed by AR Dept. of Health.
2008	0.007 ppm	0.015 ppm	Lead line replacement within the city distribution system in Ridgeway and Linwood neighborhoods.
2009	0.007 ppm	0.015 ppm	Eureka Springs on increased mandatory accelerated lead testing by AR Dept. of Health.
2010	0.007 ppm	0.015 ppm	Eureka Springs taken off mandatory accelerated lead testing by AR Dept. of Health.
2011	0.007 ppm	0.015 ppm	Eureka Springs continued to monitor lead levels in the distribution system.
2012	0.004 ppm	0.015 ppm	Eureka Springs continued to monitor lead levels in the distribution system.
2013	0.004 ppm	0.015 ppm	Eureka Springs continued to monitor lead levels in the distribution system.
2014	0.004 ppm	0.015 ppm	Fluoride additive hearings began at State level. Eureka Springs in vocal opposition to this pending legislation. Eureka Springs continued to monitor lead levels in the distribution system.
2015	0.011 ppm	0.015 ppm	Mandated fluoride additive enacted by the State of Arkansas. Eureka Springs enacted self-imposed annual lead test monitoring - AR Dept of Health informed Eureka Springs it was the only City in the State that requested to increase testing above the federal requirements.
2016	0.011 ppm	0.015 ppm	Eureka Springs continued self-imposed annual lead test monitoring.
2017	0.011 ppm	0.015 ppm	Eureka Springs continued self-imposed annual lead test monitoring.
2018	0.014 ppm	0.015 ppm	Eureka Springs continued self-imposed annual lead test monitoring.
2019		0.015 ppm	Eureka Springs begins bi-annual lead test monitoring.



### **BEYOND LEAD/OTHER CONTRIBUTING FACTORS:**

While the State mandates the water provider to add chemicals, the State also requires the individual water systems to be responsible for any exceeding of test results. We ran a complete set of water parameters on our distribution system, and the pH and fluoride were in the proper range, the Langelier Index, as well as the Ryznar Stability Index. The Ryznar quantifies the relationship between calcium carbonate and scale formation. This led to a meeting with the Carroll Boone Board, Tyson and the cities of Eureka Springs, Berryville, Green Forest, and Harrison where Carroll Boone Water District offered to adjust the alkalinity and pH of the source water. This treatment was approved by the state and postponed Harrison of their pending treatment requirements. This process is being eased in, the hope is this adjustment will protect our pipes from corrosion. Future water tests will determine our next course of action if required. Injecting phosphates, if required due to the Carroll Boone water treatment, could lead to wastewater phosphate test results exceeding the one mg/L limit. The city has been meeting its wastewater requirements for several years, and any addition of phosphates could cause secondary issues at the wastewater treatment plant and substantial budget increases.

### **WHERE WE ARE TODAY:**

Transmission water mains are testing lead-free, and as city lead service lines are removed, it leaves the vast majority of lead being in private residential plumbing. Lead plumbing lines were banned in the 1920s but local plumbing codes allowed lead until the 1980s. Lead solder was banned in 1986 and lead in brass fittings were banned in 2014. If you know your home plumbing has lead, we strongly suggest you participate in have your water tested. Based on your test results and factoring in if small children, the elderly, or those with weakened immune systems are residing there will allow you to make the best choices, whether that be adding a home filter or beginning plumbing upgrades. We continue to monitor the water quality and will be running lead and copper sampling again this spring 2019. Since the corrosion correction plan has begun, each water system that receives water from Carroll Bonne will be required to test to determine the efficacy of the corrosion control treatment. Since the alkalinity of the water will be changed, every city will begin their test cycle again starting with six-month intervals - including the cities that do not contain older plumbing and have never been close to exceeding the action levels.

The revision of the Lead and Copper Rule was postponed again in 2018 but, once implemented, it is expected to make major changes in the law requirements. Consult our website or call us at Public Works 479.253.9600 if you have any questions or concerns on determining the safety of your water or how to improve it. Historic homes are one of the many things that set us apart from other cities but with them comes the responsibility of owning and maintaining historic plumbing. While we are glad we have kept lead results below action levels, the goal is to reach zero lead at each tap. The pending Lead and Copper Rule revisions will have federal funding attached, and we believe our efforts have placed Eureka Springs in a prime position to receive a portion of those funds for our citizens.



## IMPORTANT LEAD INFORMATION:

Lead exposure affects everyone, infants, young children, and pregnant women are especially vulnerable.

Lead seldom occurs naturally in water sources and most likely is caused by corrosion in lead service lines, lead solder, and brass fixtures.

Boiling water will not remove lead and may increase the concentration.

Lead cannot be absorbed through water contact with our skin.

Only use cold water for drinking, cooking, and making baby formula and cereal.

Most importantly, flush your cold water tap if it had not been used for several hours. Always flush until the water runs cool to the touch. The longer the water has been sitting in your home's pipes, the more lead it could potentially contain.

Routinely disassemble faucet aerators and rinse them. Sediment and debris may contain contaminants.

Lead service lines were routinely installed until the 1940s. Most homes built before the 1980s have lead solder connecting copper pipe, and brass fixtures were not required to be lead-free until 2014.

The City of Eureka Springs is committed to the complete removal of all lead and asbestos-concrete piping from its Distribution System. As health concerns are identified during this program, consumers will be notified.

If you have knowledge or concerns that you have lead corrosion in your plumbing system, please contact The Eureka Springs Water Department at 479-253-9600 for advice on the following:

- Finding an approved laboratory, as testing is the only way to know the severity of corrosion.
- When installing a water filter, it must be NSF/ANSI 53 approved and correctly maintained.
- When replacing lead service lines, as a partial replacement can cause increased lead levels and we strongly recommend complete replacement.
- When identifying the type and size of lines supplying water to your home.
- When determining the scope of needed plumbing upgrades.