

January 2016 Lead Sampling Study in Detroit Service Area

*Elin Betanzo, Northeast-Midwest Institute
Dr. Marc Edwards, Virginia Tech
Dr. Jeff Parks, Virginia Tech
Anurag Mantha, Virginia Tech*

In January 2016, Virginia Tech and the Northeast-Midwest Institute initiated a random sampling effort to measure lead in drinking water at homes served by the Great Lakes Water Authority (GLWA) in the Detroit metropolitan area. The results of these tests can be considered a baseline for lead levels that would have been found in Flint homes if corrosion control had continued uninterrupted from April 2014 through October 2015. These results also indicate the potential for future lead levels in Flint homes as effectiveness of corrosion control is restored, and the pipes form a protective scale to minimize lead release in service lines and household plumbing.

Twenty-four homes in the Detroit area built in 1910 through 1964 were sampled using the same 3 sample protocol that Virginia Tech used in collaboration with Flint residents. The water sampled at these homes comes from one or more of the treatment plants operated by the GLWA, which can originate from Lake Huron or the Detroit River. The GLWA uses orthophosphate for corrosion control, and use of corrosion control has been consistent at the GLWA treatment plants. The samples were analyzed by Virginia Tech.

The sampling sites were selected based on age with a focus on homes built prior to 1950; these sites also represent a spatial distribution of neighborhoods throughout the GLWA service area. Older homes were selected for the probability of lead service lines being present, but lead service lines were not confirmed through this study. Thus, this data set may, or may not, represent the highest risk homes for lead exposure in the GLWA service area.

For 1 liter first draw samples, which are comparable to compliance samples taken for the Lead and Copper Rule (LCR), the 90th percentile for this set of homes was 4.1 ppb. For reference, The 2014 Water Quality Report for the Detroit Water and Sewer Department (DSWD) reported 2.3 ppb as the 90th percentile for DWSD. The 2014 DWSD Water Quality Report reflects sampling within the City of Detroit, whereas the sampling pool for this study encompasses additional communities. The 90th percentile for the second sample, which is intended to measure water from lead service lines when present, was 4.3 ppb. The third sample provides an estimate of lead concentrations that can be achieved by flushing, for which the 90th percentile measured was 1.3 ppb. None of the samples taken for this study in the Detroit area exceeded the USEPA action level of 15 ppb.

	First Draw 90 th percentile (Range)	45 second flush 90 th percentile (Range)	5 minute flush 90 th percentile (Range)
Detroit 2014 Water Quality Report	2.3 ppb (0-not reported)	Not reported	Not reported
2016 Sampling	4.1 ppb (0-7.3)	4.3 ppb (0-7.9)	1.3 ppb (0-7.7)

It is notable that the 90th percentile for this set of random sampling sites is somewhat higher than the 90th percentile reported in the DWSD 2014 Water Quality Report. Compliance samples for the LCR should be taken at high risk homes (at least 50%) with confirmed lead service lines. In addition, the samples in this study were taken in January; lead concentrations measured in the summer are expected to be higher due to higher solubility and dissolution reaction rates associated with warmer temperatures.



