Flint, MI Filter Challenge Assessment

Attachment: ATSDR Letter to U.S. EPA Administrator
June 22, 2016
Prepared by U.S. EPA in coordination with the Unified Command Group

MDHHS Michigan Department of Health & Human Services

Genesee County Health Department
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Filter Challenge Assessment Summary

Executive Summary:

In January, 2016, the U.S. Environmental Protection Agency (EPA) initiated an assessment program to evaluate the efficacy of Brita and Pur Brand filters that are NSF certified to remove lead. These filters were distributed to residents who use the Flint Drinking Water system for consumption. The Unified Command Group (UCG) was specifically concerned about levels of lead in excess of 150 ug/L (or parts-per-billion, ppb) that may be entering these filters.

During its initial assessment, EPA collected samples of both filtered and unfiltered water from over 200 taps. Analysis revealed that these filters, when installed and operating properly, effectively reduce lead. Additionally, the maximum and average concentration of lead were exceptionally low, with most data showing lead through the filters at levels too low to be detected. The average concentration of lead through filters was just under 0.3 ug/L. (Note: approximately 80% of all results were below the detection level for lead. To calculate the average, the method detection limit was used when there was no detection.)

In mid-April, EPA briefed the UCG and requested that the health agencies review the data summary and determine if the filtered water was safe for consumption for all populations. The Agency for Toxic Substances and Disease Registry (ATSDR) recommended additional sampling at locations of full lead service lines and/or at risk populations, targeting homes with a lead service line and confirmed residency of a child less than 6 years of age (based on the Michigan Medicaid database) and homes with the highest Michigan Department of Environmental Quality (MDEQ) lead water results. ATSDR provided locations for EPA to collect samples at least 50 additional locations. The resulting data from this expanded sampling was nearly identical to the previous assessment. Lead levels in filtered water averaged less than 0.3 ug/L and all sample results were well below EPA's action level.

On June 22, 2016, ATSDR provided a summary of their review of EPA's data (attached). Their conclusion is that the Brita and Pur filters distributed in Flint are effective in consistently reducing the lead in tap water, in most cases to undetectable levels, and in all cases to levels that would not result in a significant increase in overall lead exposure. ATSDR also reported that the filter test data supports the conclusion that the use of filtered water would protect all populations, including pregnant women and children, from exposure to lead-contaminated water.

Background:

In January, 2016, as sample data from MDEQ's Residential Sampling Program was being reviewed, it became apparent that concentrations of lead in a small number of samples (less

than 1%) were greater that 150 ug/L. The NSF certified filters (Brita and Pur) were rated to remove lead to 150 ug/L or less. During initial discussions with field staff and subject matter experts, it was largely believed that these filters were likely effective at levels much higher than 150 ug/L based on (1) a study conducted by Virginia Tech University (Deshommes, 2010) and (2) the belief that the high level lead was due to particles containing high lead content as opposed to soluble lead (these particles are believed to be effectively trapped by the filters). However, out of an abundance of caution, the UCG advised a number of precautions until the filters could be further evaluated. EPA immediately proposed a "Filter Grab" sampling procedure to evaluate the filters at the tap in the City of Flint water distribution system.

Methodology:

The objective of the Filter Grab assessment was to determine if lead contamination in water in the Flint Distribution System, specifically in residential homes, is effectively removed or reduced to safe levels.

Sample locations were established by three methods:

1. Locations where MDEQ residential results indicated concentrations >150 ug/L (coded FG)
2. Locations where residents requested EPA to sample at their homes (coded FGW & FGC)
3. Locations where CDC/ATSDR requested samples at locations of full lead service lines and/or at risk populations (coded FH)

Samples were collected in accordance with the Quality Assurance Project Plan (QAPP), as described below:

Three samples are taken at the kitchen faucet and analyzed for total metals including lead:

1. Filtered Water, Existing Faucet Filter - One grab sample was collected through the existing water filter (if present). The type (brand) of the filter, status of the filter indicator, and available information from the resident regarding the time since the filter or cartridge was installed are all noted.
2. Unfiltered Water- The filter was removed, and an unfiltered water sample was collected as the first grab sample following removal of the filter and/or aerator. No cleaning or flushing was conducted prior to the unfiltered water grab sampling.
3. Filtered Water, New Faucet Filter- Following the collection of the unfiltered sample, a new filter or new filter cartridge was installed, and the water was allowed to run through the new filter for approximately two minutes. Following installation and flushing of the new filter or replacement filter cartridge, a grab sample was collected through the newly installed filter.

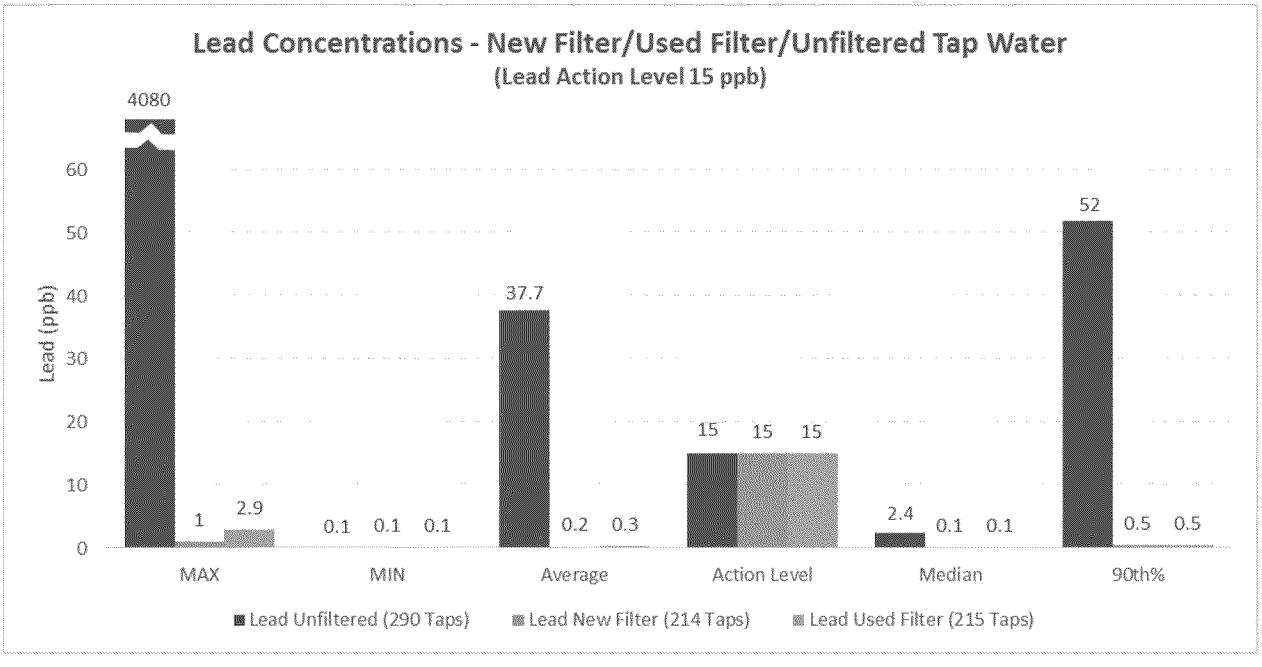
For each grab water sample, one 1,000-mL HDPE bottle was collected and field preserved (HNO3 to pH<2) for analysis of total metals including lead. Samples were then packed and shipped to the selected EPA laboratory or the PHILIS Contract Laboratory, for analysis as described in Appendix J of the QAPP.

If an expired filter was observed, based on filter indicator light or other indicators, a new filter was installed and flushed per field procedures described above. In those cases, an additional sample was collected from the expired filter.

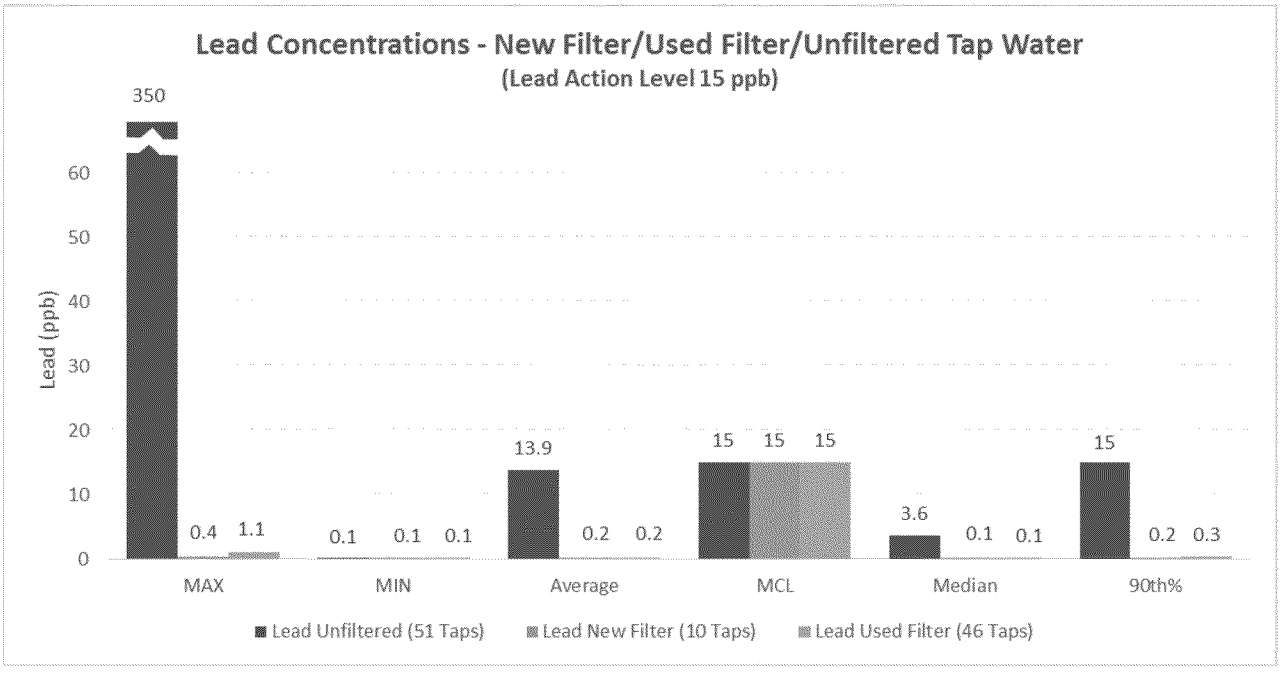
Results:

Raw data can be found on EPA's project web site: www.epa.gov/flint. The following tables and graphs summaries EPA's data for both filtered and unfiltered water.

Filter Grab (FG, FGC & FGW) Sample Results



*Health Request Filter Grab Sample Results**



*FH samples only included existing filter samples and unfiltered samples (no 'new' filter sample was collected unless the filter was already expired (in those cases, new and used filter samples were collected). In addition, in FH samples, the unfiltered portion was collect via the by-pass valve as opposed to removing the entire filter.

Conclusions:

EPA and ATSDR evaluated the resulting data and reported to the UCG. The following conclusions were drawn:

1) The field data collected by EPA indicate that the use of distributed Brita and Pur point-of-use faucet filters, when installed and maintained properly, are effective at removing lead. The resulting average concentration of filtered water is less than 1 ppb.

2) ATSDR reports that consuming filtered water at these lead levels would not cause significantly increased blood lead levels.

3) ATSDR continues to support the multi-agency recommendation to use filtered water for cooking and drinking. The filter test data supports the conclusion that the use of filtered water would protect all populations, including pregnant women and children, from exposure to lead-contaminated water (see attached letter from Patrick N. Breysse to EPA Administrator McCarthy).

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30329-4027

June 22, 2016

Dear Administrator McCarthy:

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) appreciates the close working relationship established in the past with the U.S. Environmental Protection Agency, which has been strengthened as we work on objectives for the health and safety of the citizens of Flint, Michigan.

EPA conducted additional water filter tests in the households of Flint residents that included pregnant women, nursing and bottle-fed children, and children under six. CDC requested this additional sampling to ensure that those Flint residents most vulnerable to health impacts of potential lead exposure were adequately represented in water testing. We appreciate EPA's collaboration in conducting these tests in addition to EPA's previously collected samples.

After reviewing the findings of all of the water filter tests taken, including those done for more vulnerable residents, CDC concurs with EPA that when using an approved and properly installed and maintained water filter, it is safe for residents of Flint to drink filtered tap water, including pregnant women, nursing and bottle-fed children, and children under six.

Sincerely,

Patrick N. Breysse, PhD, CIH
Director
National Center for Environmental Health
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention