



INDEPENDENT LEAD TESTING IN FLINT, MICHIGAN

Testing period 1

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Introduction

Under the settlement agreement approved by the court in *Concerned Pastors for Social Action et al. v. Khouri et al.*, 16-cv-10277 (E.D. Mich.), the parties to that litigation agreed to establish an independent monitoring program to conduct third-party household tap water monitoring for lead in Flint, Michigan. The data presented herein were collected as part of this agreement for a seven-month period starting August 28, 2017. The seventh month was allowed for sample collection as agreed upon by the parties (City of Flint, State of Michigan, and the plaintiffs).

Recruitment of Potential Volunteers

Potential volunteers were identified from lists provided by the City of Flint. These lists contained information on service line composition and the results of initial excavations to identify service line material conducted by the City's FAST Start program. More than 1500 letters were sent to occupants of homes that were listed as having lead service lines. In addition, canvassing of homes was done in October 2017 and again in February and March 2018. Over 300 homes were visited.

In addition, posters were prepared and distributed to churches, posted online on various social media sites, and a Facebook page was created.

Volunteer Education

Once a volunteer agreed to participate, they were given a sample kit which contained a 1 L wide mouth bottle to take the sample in, instructions on how to take the sample, and a chain-of-custody form. A phone number and email address was provided for residents to contact us if they had any questions.

Sampling and Analysis

The sampling procedure was in accord with that described in the US Environmental Protection Agency's Lead-Copper Rule. The instructions, as shown in the Appendix, informed the residents to take the samples after a stagnation period of at least six hours. The wide-mouthed plastic bottles used were provided by the laboratory doing the analysis and were cleaned in accordance with established procedures.

Samples were accepted from the residents and taken by Michigan State University employees to a certified laboratory where they were analyzed in accordance with EPA Method 200.8. All samples had a chain-of-custody form. The laboratory also conducted Quality Control/Quality Assurance measures in accordance with the method. Blind (i.e., the laboratory will not know the amount of Pb in these samples or that they are check standards) check standards were routinely sent to the laboratory for analyses. The reporting limit for the lead concentration is 1 ppb.

110 samples were retrieved and by checking the latest information available on service line materials we determined that eighteen of the samples were taken from houses that were later determined to not have a lead service line or from houses that did have a lead service line, but it was replaced prior to sampling. Based on the available government records the remaining 92 houses are Tier 1 residences.

Residents were informed of the results in writing as soon as practicable after results were received from the laboratory.

Results

Table 1 provides a summary of the Tier 1 results of this sampling effort. The 90th percentile for the Tier 1 homes is 3.9 ppb. The concentrations of these samples ranged from less than 1 (the reporting limit) to 26 ppb. 94.6% of the Tier 1 samples collected had a lead concentration equal to or less than 5 ppb. A map showing the distribution of the sampling locations in reference to the FAST Start Initiative sites is presented in Figure 2.

Table 2 provides a summary of the non-Tier 1 results. 89.9% of the non-Tier 1 samples collected had a lead concentration equal to or less than 5 ppb. The maximum concentration is 16 ppb. Samples that are noted as having a lead service line but listed as non-Tier 1 sites were taken after lead service line replacement.

Table 1 Concentrations of lead in Tier 1 homes in Flint

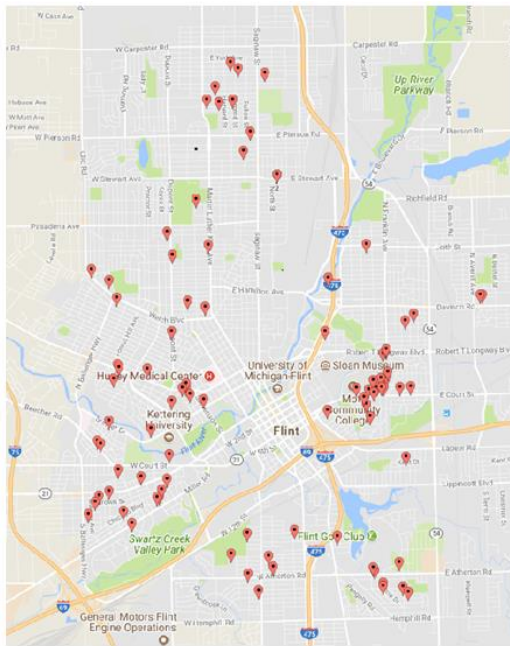
| Sample ID | Service Line Material | Date Sample Taken | Pb (ppb) |
|---------------|-----------------------|-------------------|----------|
| 2017-08-27-01 | Lead-Copper | 8/28/2017 | 4 |
| 2017-09-17-05 | Lead-Copper | 9/18/2017 | 4 |
| S03 | Lead-Copper | 9/22/2017 | <1 |
| 2017-09-24-04 | Lead-Copper | 9/28/2017 | <1 |
| 2017-09-24-01 | Lead-Copper | 10/1/2017 | <1 |
| 2017-09-24-03 | Lead-Copper | 10/4/2017 | <1 |
| 2017-09-17-02 | Lead-Copper | 10/8/2017 | 1 |
| 2017-10-01-02 | Lead-Copper | 10/8/2017 | 2 |
| 2017-10-08-04 | Lead-Copper | 10/10/2017 | 3 |
| 2017-10-01-03 | Lead-Copper | 10/14/2017 | <1 |
| 2017-09-24-05 | Lead-Copper | 10/15/2017 | <1 |
| 2017-09-24-06 | Lead-Copper | 10/15/2017 | <1 |
| 2017-10-08-02 | Lead-Copper | 10/15/2017 | <1 |
| 01-FNT-22 | Lead-Copper | 10/16/2017 | <1 |
| 01-FNT-21 | Lead-Copper | 10/23/2017 | <1 |
| 01-FNT-33 | Lead-Copper | 10/25/2017 | <1 |
| 01-FNT-49 | Lead-Copper | 10/29/2017 | <1 |
| 01-FNT-35 | Lead-Copper | 10/29/2017 | <1 |
| 01-FNT-31 | Lead-Copper | 10/29/2017 | 1 |
| 01-FNT-34 | Lead-Copper | 10/29/2017 | <1 |
| 01-FNT-32 | Lead | 10/29/2017 | 2 |
| 01-FNT-51 | Lead-Copper | 10/31/2017 | <1 |
| 01-FNT-42 | Lead-Copper | 10/31/2017 | 1 |
| 01-FNT-26 | Lead-Copper | 10/31/2017 | 3 |
| 01-FNT-57 | Lead-Copper | 11/1/2017 | 1 |
| 01-FNT-43 | Lead-Copper | 11/1/2017 | <1 |
| 01-FNT-54 | Lead-Copper | 11/4/2017 | 4 |

| Sample ID | Service Line Material | Date Sample Taken | Pb (ppb) |
|---------------|-----------------------|-------------------|----------|
| 01-FNT-55 | Lead-Copper | 11/4/2017 | <1 |
| 01-FNT-29 | Lead-Copper | 11/4/2017 | 26 |
| 01-FNT-28 | Lead-Copper | 11/4/2017 | 1 |
| 01-FNT-53 | Lead-Copper | 11/5/2017 | <1 |
| 2017-10-08-01 | Lead-Copper | 11/5/2017 | 9 |
| 01-FNT-45 | Lead-Copper | 11/6/2017 | 2 |
| 01-FNT-44 | Lead-Copper | 11/11/2017 | <1 |
| 01-FNT-38 | Lead-Copper | 11/15/2017 | <1 |
| 01-FNT-52 | Lead | 11/17/2017 | <1 |
| 01-FNT-68 | Lead-Copper | 11/19/2017 | 1 |
| 01-FNT-25 | Lead | 11/19/2017 | 2 |
| 01-FNT-36 | Lead-Copper | 12/1/2017 | 2 |
| 01-FNT-39 | Lead-Copper | 12/1/2017 | 1 |
| 01-FNT-60 | Lead-Copper | 12/1/2017 | 1 |
| 01-FNT-63 | Lead-Copper | 12/5/2017 | <1 |
| 01-FNT-79 | Lead-Copper | 1/14/2018 | <1 |
| 01-FNT-62 | Lead-Copper | 1/14/2018 | <1 |
| 01-FNT-78 | Lead-Copper | 1/20/2018 | 1 |
| 01-FNT-123 | Lead-Copper | 1/24/2018 | <1 |
| 01-FNT-106 | Lead-Copper | 1/27/2018 | 7 |
| 01-FNT-115 | Lead-Copper | 1/27/2018 | 2 |
| 01-FNT-125 | Lead-Copper | 1/28/2018 | <1 |
| 01-FNT-95 | Lead-Copper | 1/28/2018 | <1 |
| 01-FNT-91 | Lead-Copper | 1/28/2018 | 2 |
| 01-FNT-99 | Lead-Copper | 1/28/2018 | 1 |
| 01-FNT-87 | Lead-Copper | 2/2/2018 | <1 |
| 01-FNT-114 | Lead-Copper | 2/3/2018 | <1 |
| 01-FNT-107 | Lead-Copper | 2/3/2018 | 1 |
| 01-FNT-111 | Lead-Copper | 2/3/2018 | <1 |
| 01-FNT-98 | Lead-Copper | 2/3/2018 | 2 |
| 01-FNT-117 | Lead-Copper | 2/3/2018 | 1 |
| 01-FNT-122 | Lead-Copper | 2/3/2018 | <1 |
| 01-FNT-104 | Lead-Copper | 2/3/2018 | 7 |
| 01-FNT-105 | Lead-Copper | 2/3/2018 | 14 |
| 01-FNT-118 | Lead-Copper | 2/3/2018 | <1 |
| 01-FNT-102 | Lead-Copper | 2/3/2018 | 3 |
| 01-FNT-108 | Lead-Copper | 2/3/2018 | <1 |
| 01-FNT-120 | Lead-Copper | 2/4/2018 | 2 |
| 01-FNT-116 | Lead-Copper | 2/8/2018 | <1 |
| 01-FNT-103 | Lead-Copper | 2/11/2018 | <1 |
| 01-FNT-137 | Lead-Copper | 2/21/2018 | <1 |
| 01-FNT-121 | Lead-Copper | 2/23/2018 | <1 |
| 01-FNT-126 | Lead-Copper | 2/24/2018 | <1 |
| 01-FNT-119 | Lead-Copper | 3/4/2018 | <1 |
| 01-FNT-24 | Lead-Copper | 3/9/2018 | 2 |
| 01-FNT-84 | Lead-Copper | 3/13/2018 | <1 |

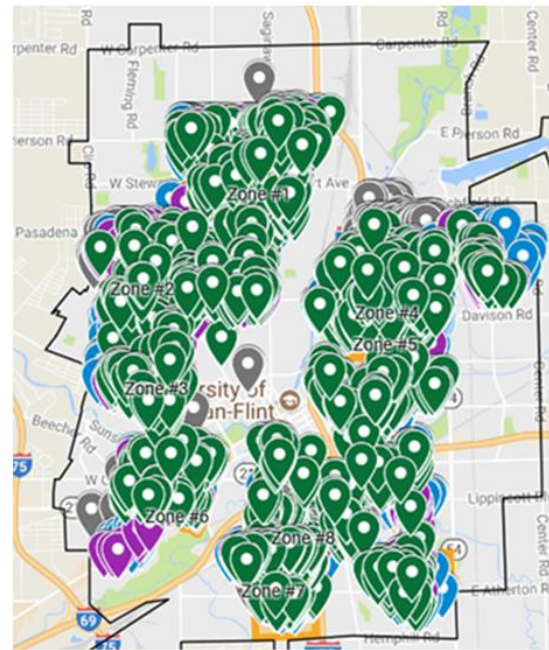
| Sample ID | Service Line Material | Date Sample Taken | Pb (ppb) |
|------------|-----------------------|-------------------|----------|
| 01-FNT-23 | Lead-Galvanized | 3/18/2018 | 4 |
| 01-FNT-129 | Lead-Galvanized | 3/18/2018 | <1 |
| 01-FNT-97 | Lead-Galvanized | 3/18/2018 | <1 |
| 01-FNT-101 | Lead-Galvanized | 3/20/2018 | 1 |
| 01-FNT-133 | Lead-Copper | 3/23/2018 | 5 |
| 01-FNT-90 | Lead-Copper | 3/23/2018 | <1 |
| 01-FNT-90 | Lead-Copper | 3/23/2018 | <1 |
| 01-FNT-128 | Lead-Galvanized | 3/23/2018 | <1 |
| 01-FNT-94 | Lead-Galvanized | 3/24/2018 | <1 |
| 01-FNT-89 | Lead-Galvanized | 3/25/2018 | 1 |
| 01-FNT-88 | Lead-Copper | 3/25/2018 | <1 |
| 01-FNT-109 | Lead-Galvanized | 3/26/2018 | 1 |
| 01-FNT-112 | Lead-Galvanized | 3/26/2018 | <1 |
| 01-FNT-130 | Lead-Galvanized | 3/26/2018 | 1 |
| 01-FNT-135 | Lead-Copper | 3/26/2018 | <1 |
| 01-FNT-83 | Lead-unknown | 3/28/2018 | <1 |
| 01-FNT-127 | Lead-Galvanized | 3/28/2018 | <1 |
| 01-FNT-139 | Lead-Galvanized | 3/28/2018 | <1 |
| 01-FNT-46 | Lead-Copper | 3/28/2018 | <1 |

Table 2 Concentrations of lead in Non-Tier 1 homes in Flint

| Sample ID | Service Line Material | Date Sample Taken | Pb (ppb) |
|---------------|-----------------------|-------------------|----------|
| 2017-09-17-01 | Lead-Copper | 9/21/2017 | <1 |
| 2017-09-17-06 | Lead-Copper | 10/8/2017 | <1 |
| 01-FNT-37 | Lead-Copper | 11/19/2017 | <1 |
| 01-FNT-41 | Lead-Copper | 10/31/2017 | 2 |
| 01-FNT-40 | Lead-Copper | 11/4/2017 | <1 |
| 2017-09-24-02 | Lead-Copper | 9/30/2017 | <1 |
| 01-FNT-136 | Copper | 2/27/2018 | <1 |
| 01-FNT-27 | Copper | 11/5/2017 | 2 |
| 2017-09-17-07 | Copper | 9/18/2017 | 4 |
| 2017-08-27-03 | Copper-copper | 9/17/2017 | 16 |
| 01-FNT-69 | Lead-Copper | 12/8/2017 | 2 |
| 2017-10-08-03 | Lead-Copper | 10/15/2017 | 2 |
| 01-FNT-30 | Copper-copper | 12/9/2017 | <1 |
| 01-FNT-64 | Lead-Copper | 11/14/2017 | 1 |
| 2017-09-17-04 | Unknown | 10/8/2017 | <1 |
| 01-FNT-58 | Copper | 11/4/2017 | <1 |
| 2017-08-27-02 | Galvanized | 8/31/2017 | 6 |
| 01-FNT-82 | Copper | 3/9/2018 | 3 |



Tier 1 sites sampled in this study



Sites in FAST program

Source: <https://www.cityofflint.com/fast-start/>

Figure 1 Comparison of location of Tier 1 sites sampled in this study with sites in the FAST Start Initiative Program.

Appendix
Sampling Brochure

Lead and copper sampling

State regulations require all community water systems to monitor for lead and copper in drinking water.

Unlike other contaminant monitoring, the samples must come from regularly used cold water taps inside customers' homes.

For more information:

About the independent monitoring program, call 517 884-8456 or email lcr.flint@gmail.com.

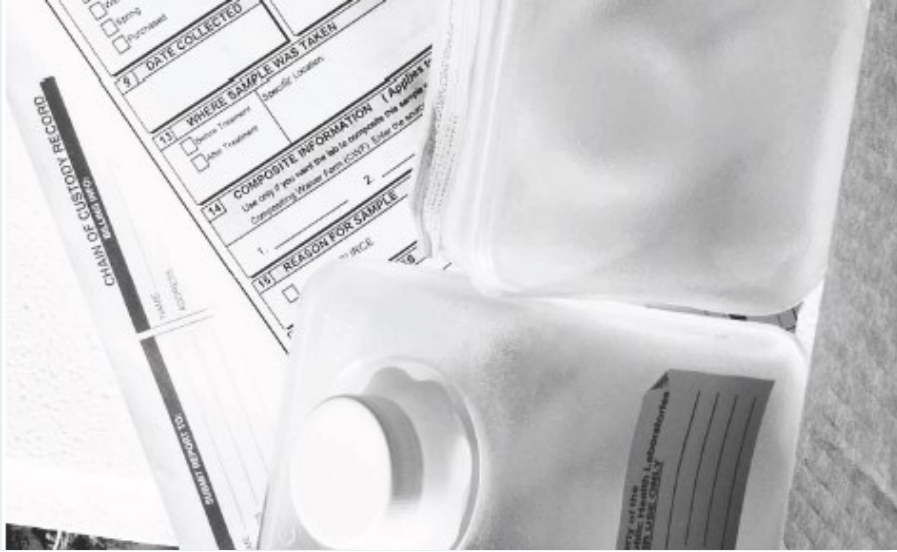
About lead and copper in your water supply, contact:

Genesee County Health Department
630 South Saginaw
Flint, MI 48502
810-257-3603

or check michigan.gov/flintwater



Lead and Copper Sampling Procedure



1 Prepare to collect the sample

- The sample must come from a regularly-used kitchen or bathroom cold-water faucet.
- The object is to get the “first draw” of the water that has been sitting stagnant in the pipes for at least 6 hours, but no more than 12 hours prior to sampling.
- To ensure stagnant water conditions exist, the best sampling times are first thing in the morning or after residents return home from work or school.
- Make sure that cold water is the last water to go through the faucet before the water sits stagnant in the pipes for the 6-12 hours prior to sampling.
- Do not remove the aerator from the faucet .
- When you receive the sample bottle, it will contain a small amount of liquid. The liquid is part of the test— please do not rinse the liquid from the bottle.

2 Collect the sample

- Do not run any water immediately before collecting the sample.
- Make sure that the water does not go through a hose, water softener or any kind of filter before it reaches the sample container.
- Place the open bottle below the faucet and gently and fully open the cold-water tap.
- Fill the sample container to the shoulder of the bottle or the line marked “1,000 mL” and turn the water off.
- Cap the bottle tightly.
- Dry outside of bottle and place it in the plastic bag that was provided.

3 Complete the lab form

- Print your name in the box for “sampler”
- Write the date and time the sample was collected next to the sample code.

4 Sample pickup

- When your sample is ready for pickup call 517 884-8456 or email lcr.flint@gmail.com
- Be sure to leave your name and contact information so we can arrange to pickup your sample.
- The sampler will need to be present for the pick-up. If that is not possible, please let us know so we can make alternate arrangements.

