



# INDEPENDENT LEAD TESTING IN FLINT, MICHIGAN

Testing period 2

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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 May 20, 2018.

## Recruitment of Potential Volunteers

Potential volunteers were identified from lists provided by the City of Flint, as detailed below. Door-to-door canvassing of homes was done throughout the seven-month period. More than 900 homes were visited.

## Volunteer Education

Once a volunteer agreed to participate, they were given a water sampling kit that contained a 1 L wide mouth polypropylene bottle to take the sample in, instructions on how to take the sample, and a chain-of-custody (COC) form. A phone number and email address were provided for residents to contact us if they had any questions and to inform us when the sample was ready to be picked up.

## Methodology

MSU personnel began distributing sample kits as part of the Phase II effort on May 19, 2018. Two lists were used for this effort: the list of residents participating in Phase I and the list of residents whose service lines had been identified using hydrovac excavation. As the latter list provided the most accurate information regarding service line material, our goal was to contact residents before service line material replacement began during the Summer of 2018. The initial effort was very successful, with 100% of the 33 residents we visited agreeing to participate in the sampling effort.

As per instructions from the NRDC, MSU personnel stopped distributing kits after June 16, 2018 and stopped contacting residents to collect the kits that had been distributed. Kits were collected only if the resident contacted the MSU staff to request collection. MSU staff resumed distributing kits on August 18, 2018 after the new contract for an additional independent monitor, the University of Notre Dame (UND), was established. A summary of the number of sample kits distributed and collected by month is provided in Table 1. Below is a summary of some of the issues that arose during the new collection period and of the specific efforts taken to find new potential Tier 1 homes:

- The number of residents willing to participate decreased over the summer. The reasons provided by the residents included: (1) unwilling to participate due to the number of lawsuits, (2) lack of interest, and (3) that they did not see the need for further testing.
- By the end of the summer, most of the homes on the “hydrovacked but not replaced” list had service lines replaced. The residents of all homes on the “hydrovacked” list had been visited and/or called.

- The Phase V list was provided on August 16, 2018. The legend explaining abbreviations used in the list was provided the week of September 16, 2018. On that list, there were only 357 homes designated as having lead service lines (i.e., Tier 1 sites). The list was provided to the UND team to use to begin canvassing and distributing sample kits.
- On November 1, 2018, the updated Phase V list was requested from Mr. William Kim (City of Flint) so that the UND team could cross-examine the past and current lists to avoid visiting homes that had been either delisted as a Tier 1 site (because the site had been misidentified as a Tier 1 site) or had their lead service lines (LSLs) replaced. The list was provided by Mr. Kim on November 3, 2018; however, the “updated Phase V” list contained only a few homes that were on the original Phase V lists. Nonetheless, the UND team used these two lists as a starting point for their canvassing effort. The UND team visited Flint on November 3 and 4, 2018, and again on December 1 and 2, 2018, exhausting the Phase V list. A significant number of the homes had visible lines of ground excavation, indicating potential LSL replacement. These homes were not listed on the updated Phase V list provided by the City. As such, the UND team did not rely on the “updated Phase V” list, but rather focused on visiting only homes on the original Phase V list provided on August 16, 2018. Additionally, numerous addresses on the Phase V list were not applicable because those homes were either unoccupied, no home existed on the property, or the address was a business property. From the Phase V list, UND distributed 14 sample kits and 13 of these were retrieved.
- On December 14, 2018, the Team requested from Mr. Kim the ArcGIS shapefiles and database used to create the FAST Start online ArcGIS map of all homes that had their service lines explored and/or replaced (<https://www.cityofflint.com/fast-start>). The files were delivered on December 18, 2018. This data (i.e., Phases I-V) was compared with the ArcGIS files prepared by Professor Kaufman of UM-Flint, which document the predicted LSLs based on historical data (i.e., home age, city records, etc.). Approximately 300 addresses with potential LSLs were identified – these addresses were not on the FAST Start website. Of these, two hundred and seventy-six (276) homes were visited by the MSU team on January 13 and 14, 2019. All addresses either had their pipes replaced, were abandoned, or were not residences. To the best of our knowledge, without access to the Phase VI list, this exhausted all available potential Tier 1 LSL addresses.

### 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.

Fifty-six samples were accepted from the residents and taken by either MSU or UND employees to a certified laboratory where they were analyzed in accordance with EPA Method 200.8. All samples had a COC form. The laboratory also conducted Quality Control/Quality Assurance measures in accordance with the method. Blind (i.e., the laboratory did not know the amount of Pb in these samples or that they were check standards) check standards were

routinely sent to the laboratory for analyses. The reporting limit for the lead concentration is 1 ppb.

After results were received from the laboratory, the Teams informed the residents in writing as soon as practicable. If the results exceeded 15 ppb lead, as per the contract with the NRDC, the residents were contacted by phone.

## Results

Table 1 provides a summary of the Tier 1 results of this sampling effort. The 90<sup>th</sup> percentile for the Tier 1 homes is 4.0 ppb. The concentrations of these samples ranged from less than 1 (the reporting limit) to 923 ppb. 94% of the Tier 1 samples collected had a lead concentration equal to or less than 5 ppb. The two homes with lead values above 15 ppb had their service lines replaced after sampling and collection. A map showing the distribution of the sampling locations is presented in Figure 1. Table 2 provides a summary of the monitoring results of homes that were verified as non-Tier 1 sites. These homes were sampled under the impression that they still had LSLs (i.e., Tier 1), but after post-validation using updated FAST Start data, these were found to have their LSLs replaced prior to sampling and, thus, were non-Tier 1 homes.

**Table 1. Concentrations of lead in Tier 1 homes in Flint.**

Sample ID	Date Sample Taken	Pb (ppb)
02-FNT-35	5/20/2018	<1
02-FNT-48	5/21/2018	<1
02-FNT-19	5/21/2018	<1
02-FNT-49	5/22/2018	<1
02-FNT-30	5/22/2018	<1
02-FNT-33	5/24/2018	1
02-FNT-32	5/25/2018	<1
02-FNT-37	5/26/2018	<1
02-FNT-28	5/26/2018	1
02-FNT-23	5/26/2018	<1
02-FNT-21	5/26/2018	63
02-FNT-17	5/26/2018	3
02-FNT-27	5/26/2018	3
02-FNT-38	5/27/2018	<1
02-FNT-18	5/27/2018	<1
02-FNT-44	5/28/2018	2
02-FNT-24	5/29/2018	<1
02-FNT-26	5/29/2018	<1
02-FNT-41	5/31/2018	<1
02-FNT-46	6/2/2018	<1
02-FNT-20	6/3/2018	4

Sample ID	Date Sample Taken	Pb (ppb)
02-FNT-25	6/3/2018	<1
02-FNT-57	6/4/2018	1
02-FNT-75	6/8/2018	<1
02-FNT-43	6/9/2018	<1
02-FNT-53	6/9/2018	<1
02-FNT-70	6/12/2018	2
02-FNT-52	6/16/2018	1
02-FNT-63	6/18/2018	2
02-FNT-22	6/18/2018	<1
02-FNT-47	6/23/2018	3
02-FNT-74	6/23/2018	6
02-FNT-71	7/14/2018	2
02-FNT-66	7/21/2018	<1
02-FNT-109	8/22/2018	<1
02-FNT-61	8/24/2018	<1
02-FNT-95	8/24/2018	2
02-FNT-96	9/12/2018	5
02-FNT-91	9/12/2018	1
02-FNT-100	9/12/2018	923
02-FNT-105	9/22/2018	4
02-FNT-98	9/22/2018	<1
05-FNT-01	11/6/2018	1
05-FNT-08	12/1/2018	<1
05-FNT-02	12/1/2018	<1
05-FNT-06	12/2/2018	1
05-FNT-09	12/2/2018	<1
05-FNT-20	12/2/2018	<1
05-FNT-07	12/2/2018	1
05-FNT-10	12/2/2018	<1
05-FNT-11	12/9/2018	<1

**Table 2. Concentrations of lead in non-Tier 1 homes in Flint.**

Sample ID	Date Sample Taken	Date Line Replaced	Pb (ppb)
02-FNT-36	6/9/2018	11/3/2016	<1
05-FNT-05	12/1/2018	06/08/2018	<1
05-FNT-22	12/2/2018	8/15/2018	<1
05-FNT-24	12/8/2018	06/20/2018	12
05-FNT-23	12/15/2018	8/16/2018	<1

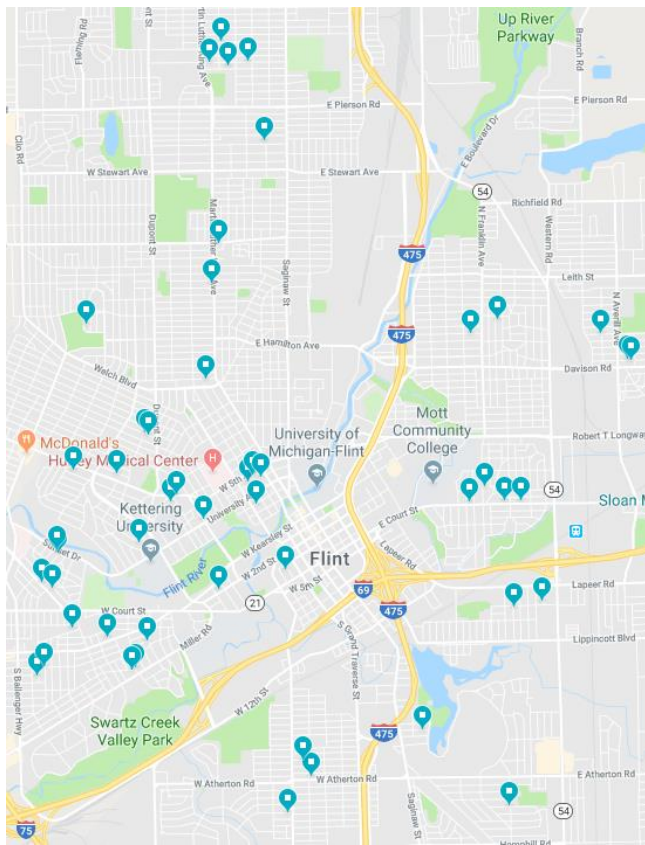


Figure 1. Tier 1 sites sampled in this study.

**Appendix**  
Sampling Brochure