Flint Safe Drinking Water Task Force Comments on Michigan Department of Environmental Quality (MDEQ) Draft Protocol for Collecting Water Samples at Schools for Lead Analysis; Dated October 21, 2015

This response is intended to identify how the comments received from the Flint Safe Drinking Water Task Force have been addressed.

On October 19, 2015, the MDEQ submitted a draft protocol for the collection of water samples at the Flint Public Schools. Based on the recommendations provided, state plumbing inspectors were assigned by the Michigan Department of Licensing and Regulatory Affairs to complete a plumbing assessment of the school to be sampled. Assessments were generally completed on a Friday with MDEQ staff, and the sampling was generally completed on the next day after the pipes were flushed late Friday afternoon by school personnel. The assessments included an evaluation of the plumbing plans that were available and an inventory of the fixtures and flow throughout the school. Sampling was sequenced to make sure that water in the pipes was not disturbed in obtaining the first draw samples. Subsequent to the first school that was sampled, the MDEQ returned the following week to conduct the sequential sampling recommended by the Task Force at two or three sites, depending on the plumbing assessment of that school. This was also completed at every public school that was subsequently sampled. As sampling proceeded, it became evident that the outdated fixtures were causing the release of lead identified by analysis of the samples. In some cases, the problem extended to brass piping that was found under the sinks. All public schools have now been sampled, and the decision was made is to replace all of the fixtures and any brass piping that was found in all of the schools. This process is underway and is expected to be completed in April 2016.

DRAFT – WORK IN PROGRESS

Protocol for Collecting Water Samples at Schools for Lead Analysis

The following is the procedure being used by the Michigan Department of Environmental Quality to ensure samples from schools on city of Flint water are collected in a systematic, consistent manner to provide meaningful results. By following the below procedures school and health officials will have information to be able to identify and correct sources that contribute lead into drinking water. The procedures being used are:

- With the assistance from Department of Licensing and Regulatory Affairs (LARA) staff, conduct an on-site assessment of the building plumbing to identify plumbing components of concern and prioritize sample sites.
- DEQ and LARA staffs collect the samples from prioritized sites and in the sequence recommended by LARA.
- Submit the samples and appropriate paperwork to the DEQ Drinking Water Laboratory.
- Laboratory performs analysis and informs DEQ (ODWMA) staff of the results.
- DEQ informs DHHS of test results, and they jointly interpret the results.
- DHHS and DEQ staff relays the results to school officials and confers on any follow-up or corrective remedies that may be needed.

Step 1 – Prepare for On-Site Assessment

In order to assist LARA staff to identify and prioritize sample sites, school staff are being asked to compile, collect, and review any records pertaining to the building plumbing. This includes building permits, plumbing permits, as built plans, and information about the service line and all potable water pipes, fixtures and appurtenances within the building. At a minimum, a diagram of each floor layout should be provided. In addition, answers to the following questions will help streamline the on-site assessment process.

- When was the facility built?

- Have new buildings or additions been added? If so, when were they added? If built since 1986, were lead-free plumbing and solder used?

- When were the most recent plumbing repairs made and where were they located?

- What are the potable water pipes in the facility made of and what is their location? Options include: lead, brass, copper, plastic, galvanized metal and other materials. What materials were used to solder the potable water pipes in the system? Are brass taps, fittings or valves used? Note the locations.

- How many of the following outlets provide water for consumption: Bubblers, ice makers, water coolers and kitchen taps. Note their location. Include taps that might be used for making coffee or preparing formula.

- What brands and models of water coolers (cooled drinking fountains) provide water in the facility and what is their location?

- Do faucets have accessible screens and have they been cleaned?

- Can you detect any signs of corrosion, such as leaks, rust-colored water or stains?

- Is any electrical equipment grounded to water pipes?

- Are there any records of previous water testing?

Step 2 – LARA Arranges for On-site Plumbing Assessment

LARA staff will contact school officials/staff and set a date and time for the assessment. A school representative familiar with the building layout and plumbing system should accompany LARA staff as they conduct the assessment. A room reserved for records review should also available. If possible, a DEQ staff person will also accompany and assist LARA staff performing the on-site plumbing inspection.

As part of the on-site assessment, LARA staff should identify if there is any water treatment being done in the building, i.e., point of use (POU) or point of entry (POE).

Step 3 – LARA Prioritizes Sample Sites and Sampling Sequence

This protocol is for all faucets, taps and outlets that are used regularly by students and staff for drinking, cooking, making coffee or food preparation to be sampled. Sampling locations include:

- Drinking Fountains (both bubblers and water cooler style).
- Kitchen Sinks, faucets or taps.
- Breakroom, classroom, teachers' lounge or other sinks known to be or visibly used for consumption (water glasses or coffeemaker and/or cups are nearby).

LARA staff will assign a sample site Identification (ID) number for each sample site and will determine the order in which each site is to be sampled. The ID number will reflect the type of tap/outlet and location. Each sampling location will be documented with digital photos, if possible. Staff should record any model number of faucets, valves, etc. that are accessible to inspection. If potential brass devices are seen they should be noted.

To determine the sampling sequence, LARA staff will identify the site closest to the service line to be collected first. LARA staff will then determine the appropriate sequence/order to sample each outlet beginning closest to the water main and continuing out farther from the service line until the site the farthest away is sampled last. This will minimize the chance that the piping may be flushed by a downstream or other sample location prior to collecting the samples at that site.

LARA staff will also identify any water coolers that should have been removed under the Lead Contamination Control Act (LCCA) in 1988. The LCCA mandated the repair, replacement or recall and refund of drinking water coolers with lead-lined water tanks. LARA staff will confirm that there are no recalled water coolers on-site. Any coolers that should have been removed will be marked for removal or replacement.

Step 4 - Labeling the Sample Sites and Preparing Labels for the Bottles

Coding Scheme for Water Outlets

A drinking water bubbler (DW) that was the 15th outlet counted, might be coded as follows.

- DW-015
- DW= drinking water bubbler
- WC = water cooler (chiller unit)
- CF = classroom faucet
- KC = kitchen faucet, cold
- KH = kitchen faucet, hot
- EC = home economics room, cold
- EH = home economics room sink, hot
- BF = bathroom faucet
- NS = nurse's office sink
- SC = service connector

In addition to the unique outlet code, a unique sample identifier is necessary since four samples will be taken from each outlet.

For example, the first draw (P1) and flush (F01) samples taken for the above outlet would be DW-015-P1, and DW-015-F01.

- P = primary (first draw) sample – P1 and P2
- F = flush
- 01 = first flush sample at 30 seconds
- 02 = second flush sample at 2 minutes

Step 5 – Prior to Sample Collection

Once LARA staff has labeled each outlet, school personnel should ensure that the labels are maintained. Even after the initial sampling, it will be important to keep a record of each tap designation so that any future or follow-up sampling can be correlated to the correct outlet. Digital photos will assist with this if necessary.

Also, since drinking water has not been consumed from taps within the school buildings for several weeks, it is important to flush the taps the day prior to the sampling. For purposes of these sampling events, at the time of the on-site assessment LARA staff will ensure that each sampling location is run for two minutes to clear the faucet. This should be sufficient as long as the sampling teams are scheduled to arrive the next day to collect samples.

Each outlet should be labeled and posted **"DO NOT USE"** so that no water is used before sampling occurs. The sample sequence will be determined by LARA so that sampling will occur closest to the water main/service line provided by the city.

Step 6 – Collect the Samples

After the sites and order of collection have been determined by LARA staff, and the taps flushed, samples will be collected the next day by DEQ and LARA staff. School personnel will be notified to ensure water is not used in the building. (Scheduling for sampling should confirm that there are no evening activities in the building or on-site the night before sampling). In addition, no outlets or water should be used in the building until sampling is completed. Use of bathrooms, etc. could draw fresh water through the piping system and alter the effects of stagnation.

A team of 3 is used for each sample collection location. Each team consists of one DEQ staff to keep water flowing/shut off at appropriate times and maintain pencil stream flow, plus one DEQ staff to collect the water samples, and one LARA inspector to ensure the proper order of unique sample locations and to keep official time for flushing periods. DEQ staffs will ensure accurate completion of labeling sample bottles and the Request for Analysis forms.

Arrange ahead of time to utilize a rolling cart for transporting sample units and water samples during the sampling event. After sampling has been completed, transport the samples from the rolling cart to the staff vehicle and return the rolling cart to the building. Staff may need to bring a folding wheeled cart if an on-site rolling cart is not available.

Sampling containers will be provided by the DEQ Drinking Water Laboratory.

1. Four samples will be collected from each designated sample site. There will be four 125 milliliter (ml) samples collected at each outlet. Sample units for this evaluation/survey will be designated 32CC.

2. Collect all water samples before proceeding with normal use of the water supply. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is collected.

3. Notes should be taken at each sampling location regarding any treatment device that may be present (e.g., is there an in-line filter at that location) and whether the outlet/tap has an aerator present. Document other noteworthy items for each location such as leaky faucet, rust stained sink, etc.

4. Do not remove the aerator if there is one.

5. The four samples from each site are to be collected as follows: 2 – consecutive first draw samples, after a 30 second flush, and a 2 minute flush as follows:

a. Before beginning the sampling process, write on each sample bottle's green label an identification code according to the sample tap coding, and type of sample collected (i.e. P1, P2, F01, F02) using a black Fine Point Sharpie permanent marker. To ensure clarity for the DEQ lab data coders draw a slash mark through each zero, the number one is a straight vertical line (no hat or foot), and cross each number seven.
b. Next, using a red Sharpie permanent marker, write '1' on the white cap of the sample unit marked as P1; write '2' on the cap of the unit marked as P2; write '3' of the cap for the unit marked as F01, and write '4' on the cap of the unit marked as F02.
c. The Request for Analysis forms will be pre-populated with necessary account billing number, name of building, school or owner, address and parameter to be tested. Each team must fill in the Date Collected, Time, Sampling Point (unique outlet location code provided by LARA), and Site Code (unique sample identifier [P1, P2, F01, F02]) using a pen, pencil or black Sharpie. If the testing parameter is not already populated for Lead and Copper analyses, mark as 32CC for the 125 ml sampling units.
d. Make sure to collect the water samples in this order: "P1" for the very first-draw, P2 as the second first-draw, F01 immediately following a 30 second flush period, and F02 immediately following a 2 minute flush period.
e. After the appropriate 8 – 18 hour stagnation time, place the first bottle under the tap, open the tap to produce a slow, steady "pencil thin" flow and fill the first bottle (P1) to the appropriate level and immediately fill a second bottle (P2) without a break in stream (do not turn off the tap between the first and second bottle and do not allow water to run down the drain in between the first and second bottle).
f. Turn off tap. Cap each sample unit checking to make sure to match P1 unit to '1' white cap, P2 unit to '2' white cap.
g. Turn on tap as before and after 30 seconds, fill the third bottle marked F01.
h. Turn off tap. Cap the sample unit checking to make sure the lid matches the third sample.
i. Turn on tap as before and after 2 minutes, fill the fourth bottle marked F02.
j. Turn off tap. Cap the sample unit checking to make sure the lid matches the fourth sample.

6. Secure the appropriate request for water analysis form to the appropriate bottle (refer to the example bottle provided for "instructions") with a rubber band.

7. Bundle the four samples collected at each individual sampling location (after the proper paperwork has been banded to each bottle) and secure the four samples together with a single rubber band.

8. Place each bundle of four samples in the plastic tub.

9. Collect the remainder of the samples from all designated sites in the pre-determined order as recommended by LARA.

How to Collect an Initial (First Draw) Sample (P1 and P2)

- Wash hands off site prior to sample collection to ensure cross contamination does not take place during the sampling event.
- Complete the Request for Analysis Form accompanying the sample units. For some events this form may have many fields already populated.
- Only use 125 milliliter (ml) Unit 32CC sample containers labeled for use specifically for lead and copper (CCUB) supplied by the DEQ Drinking Water Laboratory.
- Make sure the 125 ml container is labeled with the same sample location information as that recorded on the Request for Analysis form.
- Record the sample collection location code and any other pertinent identification (i.e. P1, P2) on the label of the 125 ml Unit 32CC sample using a fine point black Sharpie permanent marker.
- Each sample unit should not be uncapped until it is time to collect the water sample.
- Sampling units that have been compromised in any way, e.g., by being touched on the threads or the interior surfaces, must not be used.
- Keep food and drink away from the water sample collection area and its container (sample unit). {10/24/2015 sample team rule: no food or drink during the event}
- Make sure no water has been withdrawn from the tap or water fountain before you collect the sample.
- If a sink faucet is being sampled, ensure only the cold water is allowed to flow.
- If a drinking water bubbler is being sampled, place good effort to first estimate the anticipated path of the water stream, then immediately adjust the sample catch to fill the 125 ml container after the flow begins.
- Remove the cap and place the bottle under the faucet or drinking water fountain that is being tested before water starts flowing from the tap.
- Turn on the water and fill the 125 ml bottle without allowing any water to run down the drain.
- If collecting two consecutive first draw samples (P1, P2), fill the first unit labeled as P1, and then immediately fill the second sample unit labeled as P2 without allowing any water to flow down the drain.
- Turn off water when the 125 ml sample unit has been filled to the neck and immediately secure the cap(s) to the container(s).
- If collecting multiple samples from the same sink faucet or drinking water bubbler (first draw(s), 30 second, 2 minute flushing), using a red Sharpie permanent marker, label the cap with “1” for the first first-draw sample (a.k.a P1), and a number “2” for the second first-draw sample (a.k.a P2). Subsequent samples are labeled on the caps as 3 and 4.
- Fold and then wrap the Request for Analysis form to the corresponding sample unit securing the paper around the unit with a rubber band.

- If multiple samples from the same sink faucet or drinking water bubbler are collected, group all samples from that same sample location with a rubber band.

How to Collect Flush Samples

Before the first flush sample is collected, allow the water to run down the drain for 30 seconds. Then collect a sample using the same protocol as above. Do not turn off the tap or adjust the flow of water between the "flush" and collecting the sample. Mark the cap of the sample unit "3" using a red Sharpie permanent marker.

Before the second flush sample is collected, allow the water to run down the drain for 2 minutes. Then collect a sample using the same protocol as above. Do not turn off the tap or adjust the flow of water between the "flush" and collecting the sample. Mark the cap of the sample unit "4" using a red Sharpie permanent marker.

Group all four samples together with their individual Request for Analysis forms attached using a rubber band and place in the plastic tub for transport back to the DEQ laboratory.

Step 7 – Consecutive/Sequential Samples

Once all 125 ml samples have been obtained, sampling will begin to collect ten consecutive/sequential 1 liter samples at three locations.

Depending on the number of sampling taps in the building, select three locations as follows:

1. For a location close to the water main service: choose an outlet that is within 5 taps away from the water main.
2. For a mid-point location: choose an outlet this is within +/- 5 taps in the middle of the longest pipe run. This may or may not be the mid-point of a building or floor.
3. For an endpoint tap: select an outlet that is 2 to 4 taps from the identified end of the plumbing pipe run.

Consecutive/Sequential samples should be labeled as follows:

1. Samples taken at the closest tap to the water main should be labeled using "A" along with the appropriate sample number along with the tap identifier used previously for that location. For example, the first consecutive sample at the closest location to the water main would be "A1" and the sample would be identified as CF-015-A1.
2. Samples taken at the mid-point tap location should be labeled using "B" along with the appropriate sample number along with the tap identifier. For example, the first consecutive sample taken at the mid-point location would be "B1" and the sample would be identified as CF-015-B1.
3. Samples taken at the endpoint tap location should be labeled using "C" along with the appropriate sample number along with the tap identifier. For example, the first consecutive sample taken at the mid-point location would be "C1" and the sample would be identified as CF-015-C1.

At each sampling location, the procedure to collect ten consecutive/sequential 1 liter samples is as follows. Remember to adjust the numbering protocol (A, B, or C) depending on the sampling location:

1. Assemble 10 1-liter 36CC sampling units labeling with a Sharpie marker on the neck or bottle cap to indicate order of collection (example: A1, A2, A3 …. A10 for the first set; B1, B2, B3 …B10 for the second set, etc.).
2. Complete the Request for Analysis form for each bottle using test code 36CC.
3. Begin sampling the first liter bottle similar to a first draw sample.
4. Fill ten 1 liter bottles consecutively without letting the water run down the drain.
5. Wrap each request for water analysis form around the appropriate bottle and use a rubber band to secure it.
6. Place each bottle with their individual Request for Analysis forms attached in the plastic tub for transport back to the DEQ Drinking Water Laboratory.
7. Deliver the sample bottles to the DEQ Drinking Water Laboratory.

Step 8 - Laboratory Performs Analysis

Samples delivered to the DEQ Drinking Water Laboratory will be analyzed in accordance with the Laboratory Services Standard Operating Procedure Document SOP #800 Revision #4 Effective Date 10/2015.

Applicable analytical methods will be in accordance with the Method for Determination of Metals in Environmental Samples, Supplement I, U.S. Environmental Protection Agency, Method 200.8, 1999 Revision 5.5.

All Method Detection Limits shall be performed according to the Code of Federal Regulations, Title 40, Part 136, Appendix B.

Analytical quality control will be in accordance with SOP #800 Revision #4.

Step 9 – Laboratory reports results to DEQ – ODWMA and DHHS staff