# UTILITY GUIDELINES ON HOW TO COLLECT AND ANALYZE SEQUENTIAL PROFILE SAMPLES

## INTRODUCTION

The growing emphasis on the Lead and Copper Rule (LCR) has led the Illinois Environmental Protection Agency (IEPA) to ask Community Water Systems (CWS) serving over 50,000 people to begin sequential lead profile sampling. Sequential sampling is used to determine if a CWS should conduct a corrosion control study to optimize their corrosion control treatment. In addition, systems with lead services serving less than 50,000 people, may wish to consider sequential sampling to determine the source of lead.

**Sequential profile sampling helps identify sources of lead in homes and service lines. 1-liter samples are collected consecutively and continuously to determine if high concentrations of lead are found at the faucet fixture, home plumbing, service line, etc.**

## SUMMARY

This document contains instructions for a sampling protocol used to create a lead profile of household plumbing. “Profiling” is a sampling strategy to identify the location(s) and source(s) of lead contributing to lead in household drinking water, including lead solder or a lead water service pipe. To create the profile, twelve or more one-liter samples of tap water will be collected one after another from the kitchen faucet (or main faucet) in the home. Each of these one-liter samples will be analyzed for total lead concentration.

## MATERIALS FOR SAMPLE COLLECTION

Prepare a kit for sample collection with the following suggested items:

- Twelve (or more) one-liter wide mouth sample bottles, glass or polypropylene. Prepare bottles (clean and acid washed) and label as per normal lead collection procedures. Do not add a preservative (acid) to the sample prior to collection.
- Permanent marking pen or sample bottle labels.
- Jar opener pad to help remove faucet aerator. Provide new replacement aerators if desired by customer.
- Lead-free wet wipes for hand cleaning (optional).
- Data collection form/chain of custody.

**<u>The following two pages can be printed for easy instructions on site:</u>**

## PREPARATION

Select the home to be sampled.

1. If possible, have two people available for sampling. Taking a profile requires rapidly handling the twelve (12) or more bottles without losing any water. The number of liters required depends on the water volume for the particular house to get to the main. Having one person to collect water from the faucet and another to handle bottles is highly recommended.
2. Use only wide-mouth bottles (1 liter, typically high-density polyethylene or equivalent).
3. **Choose the time for the sample collection event after the home plumbing system has not been used for at least six hours**. This is typically early morning before any water has been used, including shower, toilet, automatic sprinklers, etc. If the home is vacant during the day, and water is stagnant in the home plumbing for six hours, it is possible to collect the samples in the late afternoon.
4. Read through this protocol to be sure your bottles are ready and that you understand the procedure. Once the tap is open and sampling begins, sample collection must be completed. If the process is interrupted, the entire collection must be rescheduled for another day using clean bottles.

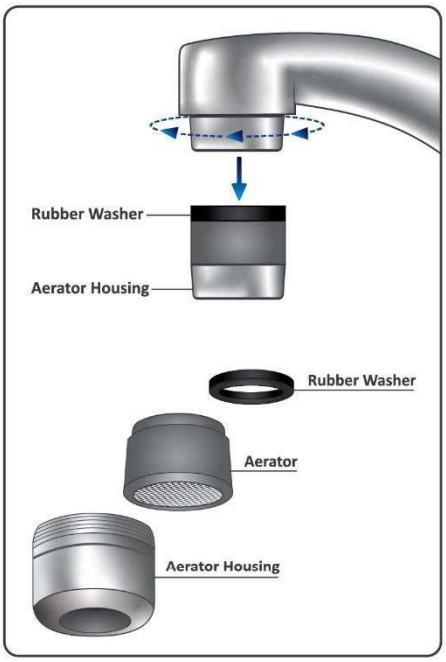
**Set up sample containers before you start. The faucet must run continuously while you fill the twelve (12) containers without allowing any water to flow to drain.**

5. Select a water faucet from which to sample.
   a. The faucet should be one that is used often by the family, such as the kitchen sink faucet.
   b. Faucet used for sampling either should not contain an aerator or screen or has an aerator/screen that can be removed prior to sampling (recommend removing aerator prior to more than 6-hour stagnation period).
   c. On the date of sampling, all the water from the faucet will need to be collected in bottles. Therefore, it will not be possible to test how to turn on the faucet unless this is done the day before or earlier. It is important to be familiar with the sink and faucet, via interviews with the customer or experimentation on site in days prior to sampling event, to verify how to ensure only COLD water is running – Do not sample hot water - and to adjust flow rate. The latter is described qualitatively as being like filling a glass of water. Quantitatively, this is about 1 gpm or about 4 L/min which is the "normal" flow rate estimated for customer use.

6. Verify that there is adequate room to arrange both empty and full sample bottles.
7. Label the sample bottles (e.g., “1” through “12”) with marker or on container labels before sampling. Do not rely solely on labeling the bottle cap.
8. When ready to collect profile samples, set all twelve (12) bottles with caps removed near the sample tap so the sampling can be done without interruption. Align them numerically 1 - 12 and place on one side of the sink to facilitate filling.
9. Make sure there is adequate room to handle sample bottles quickly without spilling them.

## PROCEDURE

**NOTE:** We recommend taking the aerator off so that particles do not get caught in the aerator while sampling. This step is optional and the IEPA may request that you leave the aerator on. So, you should check with IEPA on their current preference.




1. Fill out data form to record time and location of sampling event.
2. Wipe hands with wet wipes (optional). Set bottle labeled “1” under the faucet and open faucet to allow cold water to flow at a rate that would be normally be used by the homeowner — **cold water only.** Do not adjust flow at any time during the sampling period. As soon as the faucet is turned on, all water must be collected – don’t let any water flow to the drain. The water should remain flowing at a constant rate until all twelve (12) containers are filled.
3. Fill bottles “1,” and then “2,” etc. to one-liter mark until all twelve (12) bottles are filled, not allowing any water to go down the drain between bottles.
4. Once all of the sample bottles are collected:
   a. Turn off water.
   b. Cover each sample container tightly.
   c. Re-attach the faucet aerator/ screen using a new washer or aerator if needed.
5. Review the sample tracking sheet.
   a. Are all the bottles accounted for?
   b. Is the information for each sample bottle complete?
   c. Were there any difficulties with the sample protocol to note?
6. Transport sample bottles to the laboratory and prepare the samples for analysis as normal.