To: Biedrzycki, Paul[PBIEDR@milwaukee.gov]
From: Deltoral, Miguel
Sent: Tue 8/2/2016 8:08:34 AM
Subject: Fw: three-bottle sampling procedure
Evaluating the Effects of Full and Partial LSLR (EST Trueman June 2016).pdf

Apologies Paul, I should have copied you on this as well.

Miguel A. Del Toral
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Chicago, IL 60604
Phone: (312) 886-5253

From: Deltoral, Miguel
Sent: Tuesday, August 2, 2016 03:04 AM
To: Lewis, Carrie
Subject: Re: three-bottle sampling procedure

Hi Carrie,

Sorry for the late response, I've been out of the office since July 17.

There are two 3-sample protocols with different purposes that might be getting mixed up.

The first 3-sample protocol is being used by Chicago for residential testing as follows:

- **Following the minimum 6 hour stagnation period, a 'first-draw' sample is collected.**
- **The water is allowed to run for an additional 3 minutes and a '3 minute flushed' sample is collected.**
- **The water continues to run for a total run time of 5 minutes and a '5 minute flushed' sample is collected**

Chicago has also conducted some follow-up sequential sampling and has been posting all results online at the following website: http://chicagowaterquality.org/

This sampling protocol is not intended to characterize the amount of lead that may be present in residents' homes. The first sample is collected using the Lead and Copper Rule compliance protocol (first-draw sample) and the 3 and 5 minute flushed samples are intended to inform residents of how effective flushing can be at reducing lead levels coming into their homes if they allow the water to run for 3 minutes or 5 minutes following non-use.

The second 3-sample protocol is being used by Virginia Tech in Flint as follows:

- **The water is allowed to sit for at least 6 hours prior to the start of sampling.**
- **Following the minimum 6 hour stagnation period, a 'first-draw' sample is collected.**
- **The water is allowed to run for an additional 45 seconds and a '45 second flushed' sample is collected.**
- **The water continues to run for a total run time of 2 minutes and a '2 minute flushed' sample is collected.**

This sampling protocol also uses the Lead and Copper Rule compliance protocol (first-draw sample) as well two flushed samples. However, the 45-second and 2-minute flushed samples attempt to capture water that has resided within the service lines (45 second and 2 minute flushed samples). This sampling protocol is hit/miss at any given site (home) due to differences in the plumbing lengths/volumes between the kitchen tap and the water main but is useful for evaluating lead levels in aggregate across the system, provided a sufficient number of homes are sampled.

Also, in case you have not seen it, a peer-reviewed study on the effectiveness of full vs. partial lead service line replacement was just published. Since that is the issue we are grappling with I am attaching a copy of that as well.

If I can be of any further assistance please let me know.

Miguel A. Del Toral

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From: Lewis, Carrie <Carrie.Lewis@milwaukee.gov>
Sent: Monday, August 1, 2016 4:21:33 PM
To: Deltoral, Miguel
Subject: RE: three-bottle sampling procedure

Hello, me again. If there is any way you can help with this before noon on Tuesday, that would be awesome. MWW and the Health Department have a meeting to select a sampling protocol.

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Tuesday, July 19, 2016 2:53 PM
To: Lewis, Carrie <Carrie.Lewis@milwaukee.gov>
Subject: Re: three-bottle sampling procedure

Hi Carrie,

Apologies for not getting back to you. I'm out in Flint through Friday. I'll try to dig this up and get it to you.

Miguel A. Del Toral

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On Jul 19, 2016, at 12:49 PM, Lewis, Carrie <Carrie.Lewis@milwaukee.gov> wrote:

Hi Miguel, I just realized I have a couple different email addresses for you, so maybe I sent

this to the wrong one initially.

Hoping to hear from you.

From: Lewis, Carrie
Sent: Thursday, July 14, 2016 4:17 PM
To: Deltoral, Miguel (deltoral.miguel@epa.gov) <deltoral.miguel@epa.gov>
Cc: Couillard, Lon <Lon.A.Couillard@milwaukee.gov>
Subject: three-bottle sampling procedure

Hi Miguel,

I hope this email finds you well and enjoying summer.

On our recent conference call (thank you again, so much, for participating), you talked about a sampling protocol that was in use, I believe in Flint. You said it was proving quite informative.

You spoke about a 6-hour stagnation, then collection of the first draw 1L, letting water run for 2 minutes and collecting another 1L sample, then letting run for 3 more minutes and collecting a third 1L sample.

1) Did I remember the procedure correctly?

2) Is there a written procedure, or some reference to it, that would give it "enhanced credibility"? We are looking for ways to reduce down from the "12 consecutive 1L samples plus 13th well-flushed sample" in some situations, and your protocol sounds quite promising.

I would surely appreciate any info you can provide.

Carrie

Carrie Lewis, Superintendent

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