

Rennaker, Joanne (DEQ)

From: plevine@gcms.org
Sent: Tuesday, November 24, 2015 4:39 PM
To: Reynolds, Lawrence
Cc: Laura Sullivan; Michael Glasgow; Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Higgins, Deborah; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Michael Wright; larry.koehler@mcc.edu; Prysby, Mike (DEQ); Schock, Michael; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Busch, Stephen (DEQ); rosejo@msu.edu; Thompson, Sheryl D. (DHHS); Samir Matta; Shawn Patrick McElmurry; Warren Green; swalser@senatedems.org; Karen Weaver
Subject: Re: Technical Advisory Committee Meeting

I think that is a great idea.

Sent from my iPhone

On Nov 24, 2015, at 4:29 PM, Reynolds, Lawrence <LawrenceR@mottchc.org> wrote:

I agree . If all else fails , we can use Mott 12-2pm as planned

From: Laura Sullivan [mailto:dr.laura2@gmail.com]

Sent: Tuesday, November 24, 2015 12:20 PM

To: Michael Glasgow

Cc: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Higgins, Deborah; donna. cole; dykema; Eden Wells (DHHS); edwardsm; George Krisztian (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Reynolds, Lawrence; Michael Wright; larry.koehler@mcc.edu; Mike Prysby (DEQ); Reynolds, Lawrence; Schock, Michael; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; Pete Levine; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Stephen Busch (DEQ); rosejo@msu.edu; thompsons2@michigan.gov; Samir Matta; Shawn Patrick McElmurry; Warren Green; swalser@senatedems.org; Karen Weaver

Subject: Re: Technical Advisory Committee Meeting

Mike,

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Laura Sullivan

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Sincerely,

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Mike Glasgow
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Flint, MI 48502
(810)766-7135 ext. 2602

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Laura L. Sullivan, Ph. D.
3101 Hawthorne Drive
Flint, Michigan 48503
dr.laura2@gmail.com

Human(kind). Be both.

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From: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>
Sent: Tuesday, November 24, 2015 10:10 AM
To: Andy Leavitt; Schock, Michael; Michael Glasgow; Amy Hovey; Brent Wright; Lytle, Darren; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Lawrence Reynolds; Laura Sullivan; Wright, Michael; larry.koehler@mcc.edu; Prysby, Mike (DEQ); Lawrence Reynolds; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; Pete Levine; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Busch, Stephen (DEQ); rosejo@msu.edu; Thompson, Sheryl D. (DHHS); Samir Matta; Warren Green; swalser@senatedems.org; Karen Weaver; Prof. Susan Masten
Subject: Re: Technical Advisory Committee Meeting

This meeting should not be cancelled. There are still many issues that remain unanswered. At the least, we need to review the latest water quality results (Pb, chlorine residual, TTHM, etc.). Waiting until January is not appropriate when public health is of concern.

I understand the DPW is undergoing changes and this meeting may be difficult. However, if we are to provide technical advising we need to meet regularly and review data as it becomes available. I propose we meet as originally scheduled on Dec. 9th.

Shawn

Shawn P. McElmurry, Ph.D., P.E.
 Associate Professor
 Wayne State University
 Dept. of Civil and Environmental Engineering
 2158 Engineering Building
 5050 Anthony Wayne Dr.
 Detroit, Michigan 48202
 Phone: 313-577-3876
 Fax: 313-577-3881
 Skype: s.mcelmurry
www.eng.wayne.edu/mcelmurry

From: Andy Leavitt
Sent: Tuesday, November 24, 2015 9:51 AM
To: Schock, Michael; Michael Glasgow; Amy Hovey; Brent Wright; Lytle, Darren; Deborah Higgins; donna. cole; dykemal; Eden Wells (DHHS); edwardsm; George Krisztian (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Lawrence Reynolds; Laura Sullivan; Wright, Michael; larry.koehler@mcc.edu; Mike Prysby (DEQ); Lawrence Reynolds; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; Pete Levine; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Stephen Busch (DEQ); rosejo@msu.edu; thompsons2@michigan.gov; Samir Matta; Shawn Patrick McElmurry; Warren Green; swalser@senatedems.org; Karen Weaver
Subject: Re: Technical Advisory Committee Meeting

I echo Mr. Schock's sentiment. Seems like a great time to let the technical folks like he and others with a similar skill-set get past politics and focus on building public trust.

On Tue, Nov 24, 2015 at 9:42 AM Schock, Michael <Schock.Michael@epa.gov> wrote:

Mike;

That's unfortunate, we were planning our travel around the meeting, and it seems like there is a lot of coordination and planning to do for the many possible studies being proposed.

--Mike

Michael R. Schock

U.S. Environmental Protection Agency

ORD, NRMRL, WSWRD, TTEB

26 West Martin Luther King Drive

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Phone: 513.569.7412

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"Let's eat grandma!" "Let's eat, grandma!" Respect grammar; commas save lives!

From: Michael Glasgow [<mailto:mglasgow@cityofflint.com>]

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From: Sygo, Jim (DEQ)
Sent: Monday, November 23, 2015 1:06 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Fwd: Flint Task Force Comments on MDEQ Residential Sampling Instructions
Attachments: Task Force Comments on MDEQ Residential Sampling Instructions 11-20-15.pdf; ATT00001.htm

EPA comments for tomorrow's phone call.

Sent from my iPhone

Begin forwarded message:

From: "Kaplan, Robert" <kaplan.robert@epa.gov>
Date: November 23, 2015 at 12:40:59 PM EST
To: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
Subject: Flint Task Force Comments on MDEQ Residential Sampling Instructions

Jim,

Thanks for the opportunity to comment on the MDEQ Flint Residential Sampling Instructions. Attached please find the Task Force comments.

- Bob

Flint Drinking Water Task Force (FTF 15-2)

Task Force Comments on Flint's Residential Drinking Water Lead & Copper Sampling Instructions

EPA received the draft of Flint's Residential "Drinking Water Lead & Copper Sampling Instructions" for comment from Jim Sygo, MDEQ, on November 13, 2015. Below are comments from EPA's Flint Safe Drinking Water Task Force.

General

It should be clearly stated that these sampling instructions are for LCR compliance monitoring – from now on without the pre-flushing.

Specific Comments

1. The Task Force agrees with the removal of pre-flushing.
2. In the "Dear Resident" cover paragraph, we suggest changing the text "...provide a more accurate gauge of the amount of lead exposure...", because though this is a much better representation of the water intended to be captured by the LCR, it DOES NOT REPRESENT EXPOSURE. We suggest: "The new method is designed to provide a more accurate gauge of lead levels at the tap under normal household use using the current regulatory sampling requirements." We recommend that when the residents are sent their results, that it includes an explanation that the result does not represent lead exposure and that first draw samples have been found to underestimate lead levels in direct contact with a lead service line. It is recommended that customers continue to use the water filters that have been provided to minimize lead exposure.
3. Item 1 needs to require that samples be unfiltered/untreated. Samples may be taken from either a kitchen or bathroom faucet commonly used for drinking, provided the faucet used has no filter attached or the filter has been bypassed. Instructions need to be provided on how to bypass the faucet mount filters that have been distributed. Other home treatment devices must be bypassed too. If the resident has questions about how to bypass a treatment device, they should call the water supply.

Depending on which Flint and MDEQ feel would be more easily understood by residents, the following are two potential alternatives to current Item 1 that would ensure only untreated/unfiltered samples are collected:

Alternative 1

Select an unfiltered/untreated faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT use a faucet that has a filter attached to it unless you bypass the filter. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or a hose spigot as these samples cannot be used by your utility.

Flint Drinking Water Task Force (FTF 15-2)

Alternative 2

1: Does the kitchen tap have a faucet mount filter or a reverse osmosis unit on it? If NO, go to

1a. If YES, go to 1b.

a) Select a faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or hose spigot as these samples cannot be used by your utility.

b) Select a BATHROOM faucet that is commonly used and does not have a treatment device attached to it. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or hose spigot as these samples cannot be used by your utility.

There should be a question on the form asking if the resident has installed a faucet mount filter, so this can be recorded (see suggested change to 4C in comment 6 below). [Note: Installing the faucet mount filter would require the removal of the faucet's aerator. Does MDEQ know if the faucet mount filters being used have an aerator screen in the unit?]

4. On Item 2, the LCR currently has no upper limit on standing time, and we have published research data showing that under normal usage conditions, lead release may not have even reached equilibrium at 12 hours. The minimum of 6 hours stagnation time is used rather than a longer time so as not to discourage people from volunteering to take lead and copper samples. Therefore, for consistency with the text of the rule, we recommend just leaving it at "Wait at least 6 hours..." We understand it's not useful to collect from totally inappropriate conditions, such as vacant houses and immediately after extended vacations, but the introductory paragraph clarifies that it represents the water they would "typically drink." If it is necessary to have a maximum stagnation time, then we recommend that you use a maximum of 24 hours which is consistent with the approach that was discussed with the National Drinking Water Advisory Council Working Group as an option in 2014.

5. Again in Item 2, there must be an instruction to not use the water anywhere in the house during the stagnation period. Depending on the house plumbing configuration and pipe inside diameter (ID), using other taps, toilets, bathtubs, dishwashers, etc. may draw water from the zone of plumbing captured in a 1 liter sample. That will usually cause a low bias to the results, by bringing in fresh water. Only rarely is LSL water brought precisely into that volume captured by the sample. So, instructions need to be clear about no water use in the house.

6. Recommended language for Item 4C (for inventory purposes and to verify that the sample was unfiltered/untreated):

- Does this faucet have a faucet mount filter such as the lead filters provided to the community? Yes/No

Flint Drinking Water Task Force (FTF 15-2)

- If Yes, was the faucet mount filter bypassed during the sampling? Yes/No
- Is this faucet connected to a reverse osmosis unit? Yes/No
 - If Yes, was the reverse osmosis unit bypassed during the sampling? Yes/No
- Does the house have a home treatment device, such as a water softener or iron removal device or any other type of water treatment? Yes/No
 - If Yes, please describe _____
 - Was this home treatment device in use during sampling or the day before sampling? Yes/No

7. In our experience, and in the experience of other utilities who try to use the LCR monitoring data to assess effectiveness of their treatment for the control of lead release, the form should ask for the resident to note the approximate time of last use of that faucet from which the sample is taken, as well as the time the bottle is filled. Since the typical 6-12 hour period is not really at equilibrium in most cases, soluble lead could differ by a substantial amount from a 6 hour standing sample to, say, a 10 or 12 hour standing sample. When interpreting the data, that is good to know.

8. Not covered by the questions, but a recommendation we need to make, is to suggest that there is good research evidence that higher flow rates are the typical conditions for when consumers turn their faucets on. More particulate lead can be eroded in some circumstances, so using a wide-mouth bottle allows a much more representative sample to be collected for the conditions of consumer use. Our understanding is that MDEQ furnishes the bottles, so we recommend to change the type of bottle provided. The furnished bottles with the smaller mouth can only be filled without splashing at flow rates that are much lower than what someone normally uses to fill glasses, coffee pots, pots for cooking, etc.

These changes should be made to all of the sampling recommendations or instructions from MDEQ to all systems, not just Flint.

Rennaker, Joanne (DEQ)

From: Pete Levine <plevine@gcms.org>
Sent: Friday, November 20, 2015 8:41 PM
To: Michael Glasgow
Cc: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Lawrence Reynolds; Laura Sullivan; Michael Wright; larry.koehler@mcc.edu; Prysby, Mike (DEQ); Lawrence Reynolds; Schock, Michael; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Busch, Stephen (DEQ); rosejo@msu.edu; Thompson, Sheryl D. (DHHS); Samir Matta; Shawn Patrick McElmurry; Warren Green; swalser@senatedems.org; Karen Weaver
Subject: Re: Technical Advisory Committee Meeting

Mike, I thought we were going to meet to talk about how to sample and various other issues. It seems a shame not to continue the bit of momentum achieved at the last meeting.

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society
 4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone:810-7339925
 Fax:810-2303737
 email:plevine@gcms.org

On Fri, Nov 20, 2015 at 4:35 PM, Michael Glasgow <mglasgow@cityofflint.com> wrote:
 Advisory Team,

I am contacting everyone in regards to the Technical Advisory Committee meeting that is scheduled for December 9th at 2:00 p.m. At this time we have decided to postpone the meeting until after the start of the new year.

The city is on schedule to have the additional corrosion control measures in place in early December. We will update the committee on the implementation and the impacts we are observing throughout the water distribution system at the next scheduled meeting. We continue to have our City Hall lobby information window staffed along with an information screen, water filters, replacement cartridges, and sample bottles.

Sincerely,

--
 Mike Glasgow
 Utilities Administrator
 City of Flint

1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, November 20, 2015 5:23 PM
To: Krisztian, George (DEQ); Shaler, Karen (DEQ)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: RE: Weekly Activity

George/Karen - I don't believe action steps were drafted for this week. Hopefully a summary of activities will suffice.

I would add to those listed below:

Provided comments on final draft of DHHS residential sampling protocol for EBL investigations.

Provided comments on draft Flint compliance sampling protocol to EPA task force for comment (Jim – I thought that's what you mentioned this afternoon).

School sampling at Neithercut Elementary to occur on Saturday, November 21, 2015.

Liane

From: Busch, Stephen (DEQ)
Sent: Friday, November 20, 2015 5:08 PM
To: Prysby, Mike (DEQ); Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Subject: RE: Weekly Activity

George,

I don't have the action steps, but here are some additional activities:

- Emailed EPA on 11/19 regarding City of Flint request for guidance on corrosion control treatment evaluation for KWA source water use at Flint Water Treatment Plant. Meeting now scheduled for December 11.
- Plumbing Assessment of Neithercut Elementary School completed on 11/20.
- School reports for Eisenhower, Brownell, and Pierce Elementary schools are in progress.
- Staff meetings with Office of Auditor General legislative audit team and provided requested documentation
- Met with Governors Task force on 11/18. Documents provided on 11/16.
- Developed Partnering Plan 11/15 and 11/19

Stephen Busch, P.E.
 MDEQ Lansing District Coordinator
 Office of Drinking Water and Municipal Assistance
 Lansing and Jackson District Supervisor
 517-643-2314
buschs@michigan.gov

From: Prysby, Mike (DEQ)
Sent: Friday, November 20, 2015 4:43 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)

Cc: Busch, Stephen (DEQ)

Subject: Weekly Activity

George, Liane

Below is a summary of actions taken during the week of November 16th-20th based on the most recent action steps.

Action Step 9 - Draft letter to city of Flint documenting Stand-by Operation requirements:

Letter drafted. Letter will be completed and sent to the city following receipt review comments from LDO staff.

Action Step 11: - Continue evaluating city of Flint Service line record status and comparison to sampling pool:

The city received our Nov. 9th 2015 letter. The city contacted me concerning clarification with spreadsheet that was provided to assist the city in completing the comparison. The city also acknowledged that completion of this endeavor is a high priority item.

Action Step 18: Conduct Sampling at Durant-Tuuri-Mott Elementary and Central Kitchen:

Sampling for lead analysis was completed at the Durant-Mott Elementary school and the Central Kitchen on November 14, 2015.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, November 20, 2015 5:08 PM
To: Prysby, Mike (DEQ); Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
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Stephen Busch, P.E.
 MDEQ Lansing District Coordinator
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 517-643-2314
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Sent: Friday, November 20, 2015 4:43 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Weekly Activity

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Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

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From: Prysby, Mike (DEQ)
Sent: Friday, November 20, 2015 4:43 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Weekly Activity

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Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Friday, November 20, 2015 4:36 PM
To: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); jmikewright; Gerald (Jed) Natzke; James Henry; Jamie Gaskin; John O'Brien; JoAnne Herman; Kirk Smith; Kevin J. Keane; Lawrence Reynolds; Laura Sullivan; Michael Wright; larry.koehler@mcc.edu; Prysby, Mike (DEQ); Lawrence Reynolds; Schock, Michael; Mike Lane; Natasha Henderson; Norb Birchmeier; Robert Bincsik; Pete Levine; MVALACAK@gchd.us; Sean Kammer; Russell Hudson; Busch, Stephen (DEQ); rosejo@msu.edu; Thompson, Sheryl D. (DHHS); Samir Matta; Shawn Patrick McElmurry; Warren Green; swalser@senatedems.org; Karen Weaver
Subject: Technical Advisory Committee Meeting

Advisory Team,

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The city is on schedule to have the additional corrosion control measures in place in early December. We will update the committee on the implementation and the impacts we are observing throughout the water distribution system at the next scheduled meeting. We continue to have our City Hall lobby information window staffed along with an information screen, water filters, replacement cartridges, and sample bottles.

Sincerely,

 Mike Glasgow
 Utilities Administrator
 City of Flint
 1101 S. Saginaw St.
 Flint, MI 48502
 (810)766-7135 ext. 2602

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, November 20, 2015 4:25 PM
To: Brandon, McAndrew (OAG); Hess, Elmer (OAG)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: attachments
Attachments: LeadCopperRptConsNotice_294665_7.pdf; Flint 2015 additional results not included in 90th.pdf; Flint Bacteriological Sample Siting Plan.pdf

Elmer & Brandon, attached for the City of Flint is the Bacteriological Sample Siting Plan, excluded sample results for 2015 Lead/Copper monitoring, and the Lead & Copper Certification form with instructions that indicate the Tier and Sample Category definitions.

thank you,

Adam Rosenthal, EQA
MDEQ – Office of Drinking Water and Municipal Assistance
Lansing District – Constitution Hall 1SW
PO Box 30242
Lansing, MI 48909
517-284-6644
fax: 517-241-3571

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**LEAD AND COPPER REPORT AND
 CONSUMER NOTICE OF LEAD RESULT
 CERTIFICATE FOR COMMUNITY WATER SUPPLY**



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
 Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: _____
2. County: _____ 3. WSSN: _____
4. Population: _____ 5. Monitoring Period: From: _____ To: _____
6. Minimum # of Samples Required: _____ 7. # of Samples Taken: _____
8. Name of Certified Laboratory: _____

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☐	a. Are the same sampling points used as in the previous monitoring period?	
☐	☐	b. Are all samples from Tier 1 sites?	For more information see <i>Instructions</i> paragraph 11, subparagraph "Sample Category."
☐	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☐	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☐	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	
Comments:			

10. NAME:

Name: _____

Title: _____ Phone: _____ Date: _____

12. CONSUMER NOTICE OF LEAD RESULT CERTIFICATION: Each Community Water Supply (CWS) must deliver a Consumer Notice Of Lead Result to occupants of each location sampled within 30 days of knowing the sample result under R 325.10410(5).

Not later than 3 months following the end of the monitoring period, each CWS must mail a sample copy of the Consumer Notice Of Lead Result to the DEQ along with a certification that the notice has been distributed under R 325.10710d(f)(3).

Instructions:

- A. Use the Consumer Notice template on the next page or another approved by the DEQ.
- B. Complete one Consumer Notice for each home or building that was sampled.
- C. Mail each Consumer Notice to its corresponding home or building sampled.
- D. Select **one (1) example copy** of a notice sent to a consumer. On the bottom of the Consumer Notice, certify that:
 - A Consumer Notice was sent to persons served at each of the taps that was tested
 - Delivery was by mail or another method approved by the DEQ
 - Delivery was within 30 days of knowing the result
 - Consumer Notice includes required content:
 - The result of lead tap water monitoring for the tap that was tested
 - An explanation of the health effects of lead
 - Steps consumers can take to reduce exposure to lead in drinking water
 - Contact information for the public water supply
 - The maximum contaminant level goal and the action level for lead and the definitions for these two terms
- E. Send only **one (1) certified completed example copy** to the DEQ district office*

* For district office addresses, visit www.michigan.gov/deq and click on Contacts.

Consumer Notice of Lead Result in Drinking Water

Water Supply Name: _____

County: _____

WSSN: _____

Sample Location: _____

Date Sampled: _____

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	
	Copper (ppb)	1300	1300	

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 0.25 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: _____

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification:

WSSN: _____

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Signature _____

Title _____

Date Sent to Consumer _____

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

Instructions for Completing Lead and Copper Report Form

1. **WATER SUPPLY NAME:** Enter the name of the public water supply where sampling is being conducted.
2. **COUNTY:** Enter the name of the county in which the public water supply is located.
3. **WSSN:** Enter the 5-digit public water supply serial number (e.g., 01234 or 40123).
4. **POPULATION:** Enter the number of people served by the public water supply.
5. **MONITORING PERIOD:** Enter the beginning and end dates of the monitoring period during which the sampling took place (e.g., from 06/01/2009 to 09/30/2009).
6. **MINIMUM # OF SAMPLES REQUIRED:** This number is according to the rules based on population or set by the DEQ for lead/copper tap sampling for this public water supply.
7. **# OF SAMPLES TAKEN:** Indicate the number of tap samples taken for lead and copper analysis in the monitoring period.
8. **NAME OF CERTIFIED LABORATORY:** Enter the name of the certified laboratory performing the lead/copper analyses on samples taken in the monitoring period.
9. **SAMPLE CRITERIA:** Answer the questions accordingly, briefly explaining, where necessary, the reason for your action.
10. **NAME:** Enter the name, title, and phone of the authorized water utility official and date.
11. **TAP SAMPLING DATA:** Enter the name of the public water supply and the WSSN. Complete the remainder of the sheet as follows:

Sample Location: Enter the street address of the location where each lead and copper tap sample is taken.

Date: Enter the date the tap sample was collected.

Sample Category: Use the following numbers to designate the location criteria being met by the sample site:

	Sample Category	
Tier 1 Sites	1	Single family residence with lead service line.
	2	Single family residence with lead solder copper piping constructed after 1982.
	3	Single family residence with lead plumbing.
	4	Multiple family residence (MFR) with either lead service line, lead solder copper piping constructed after 1982, or lead plumbing (when MFR comprise at least 20 percent of the total service connections).
Tier 2 Sites	5	Buildings with lead service lines, lead solder copper piping constructed after 1982, or lead plumbing.
Tier 3 Sites	6	Single family residence with lead solder copper piping constructed before 1983.
Other		If no Tier 1, 2, or 3 sites available, sample sites that use plumbing materials commonly found at other locations in the water supply.

Additionally, if lead service lines are present, tap samples must be taken from the following:

50 percent from ...	AND 50 percent from ...
single family residences with lead service lines	single family residences with lead solder copper piping constructed after 1982 OR single family residences with lead plumbing.
Tier 1 sites should be selected for sampling over Tier 2 or 3 sites even if all samples are from lead service lines or from residences with lead solder copper piping constructed after 1982.	

Piping Materials: Designate the type of service line and building plumbing piping materials used at the location where the tap lead/copper sample was taken.

C Copper
G Galvanized
L Lead
P Plastic

Lead: Enter the concentration of lead in ppb (parts per billion) or $\mu\text{g/l}$ (micrograms per liter) as reported by the certified lab.

Copper: Enter the concentration of copper in ppb or $\mu\text{g/l}$ as reported by the certified lab.

Lab #: For lab purposes only, indicate a laboratory identification number or sample number.

12. **CONSUMER NOTICE OF LEAD RESULT CERTIFICATION:** Water supplies have until 3 months after the end of the monitoring period to submit the certification along with a sample copy of a notice sent to consumers to the appropriate DEQ district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts. However, the DEQ encourages water supplies to send the sample notice and its certification (template available on page 4) along with the Lead and Copper Report (pages 1 and 2 of this form), which is due within 10 days after the end of the monitoring period.



Michigan Department of Environmental Quality

**Replicate Laboratory Report for
Lansing Drinking Water Laboratory**

Owner/Location Information:

CITY OF FLINT
212 BROWNING AVE
FLINT MI 48507

Sample Number: LLF54945

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 2/18/2015 7:15:00 AM
Arrival Date: 2/19/2015 11:13:00 AM

Site Code:
Water Source: Public Community Water Supply
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: LEANNE WALTERS

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
7440-50-8	COPPER (RECOVERABLE)	ND	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	0.104	0.001	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:16:40 EDT
2015*was whole house filter*



Michigan Department of Environmental Quality

***Replicate Laboratory Report for
Lansing Drinking Water Laboratory***

Owner/Location Information:

CITY OF FLINT
212 BROWNING AVE
FLINT MI 48507

Sample Number: LLF56229

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 2/25/2015 10:26:00 AM

Arrival Date: 3/6/2015 11:34:24 AM

Site Code:

Water Source: Single Family Dwelling

Sample Reason: Water Quality Problem

Sample Point: Treated Public Distribution System

Point Description: KITCHEN

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.01	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Aug 27 09:25:58 EDT
2015

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003



P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57729

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	212 BROWNING AVE, FLINT	Source:	Single Family Dwelling
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	03/18/2015 11:10
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/26/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

*Not 1st draw
whole house filter*

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Kriezian



Michigan Department of Environmental Quality

**Replicate Laboratory Report for
Lansing Drinking Water Laboratory**

Owner/Location Information:

CITY OF FLINT
212 BROWNING AVE
FLINT MI 48507

Sample Number: LLF59748

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 4/2/2015 8:00:00 AM
Arrival Date: 4/14/2015 11:07:48 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Other
Sample Point: Treated Public Distribution System
Point Description: PRE P O S
Collector: Private Citizen
Collected By: LEEANNE WALTERS

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
7440-50-8	COPPER (RECOVERABLE)	0.11	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	0.707	0.001	mg/L	EPA 200.8

Laboratory Comments:

*Basement
Tap pre filter*

By authority of PA 368 of 1978 as amended.

Print Date: Thu Aug 27 09:27:00 EDT
2015



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF57732**

Official Laboratory Report

Report To: **MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505**

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1383 WASHINGTON AVE, FLINT	Source:	Single Family Dwelling
Collected By:	ANTHONY PALLADENO	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/09/2015 08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

*Past 14 day
hold time.
for presentation*

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.16	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Plepor
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF64282

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

*Business
Basement
Hot Tubs?*

System Name/Owner: CITY OF FLINT
Collection Address: 625 S GRAND TRAVERSE, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE III
Site Code:
Collector: Public Water Supply Operator
Date Collected: 05/15/2015 13:00
Date Received: 05/20/2015 11:24
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.017	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Kriszllan

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF64284

Official Laboratory Report

Report To: **MIKE GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **625 S GRAND TRAVERSE, FLINT**
Collected By: **MIKE SARGENT**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **UTILITY SINK**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **TYPE III**
Site Code:
Collector: **Private Citizen**
Date Collected: **05/18/2015 08:30**
Date Received: **05/20/2015 11:24**
Purpose: **Other**

*Not Tier 1
Business*

Not For Compliance

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.020	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

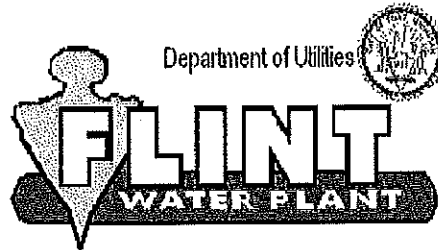
Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
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Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



Coliform Bacteria Distribution System Sample Site Plan

Table of Contents

General Information	1
Sample Site Locations, including up and down stream	2
Positive Sample Protocol & Notifications	3
Sample Site Location, Map	4

General Information

Water Supply Name:	City of Flint - Water Plant 4500 N. Dort Hwy Flint, MI 48505
Water Supply Serial Number:	2310
Population Served:	102,000
Number of monthly distribution samples required:	100
Number of Sampling Locations:	12
Sampling frequency:	At least twice weekly, varies with location.
Program Contact:	Michael Glasgow City of Flint Water Plant Laboratory & Water Quality Supervisor (810) 787-6537 ext. 3512 mglasgow@cityofflint.com

Routine Distribution System Sampling Site Locations

Site ID	Routine Site Name & Address	Up-Stream Site Name & Address	Down-Stream Site Name & Address
# 1	Arby's Restaurant	McDonalds Restaurant	Admiral Gas Station
	3742 Davison Rd.	3719 Davison Rd.	3802 Davison Rd.
	Flint, MI 48506	Flint, MI 48506	Flint, MI 48506
# 2	B & P Gas Station	Advasure Insurance	Rite Aid Pharmacy
	822 S. Dort Hwy	810 S. Dort Hwy	2838 E. Court St.
	Flint, MI 48503	Flint, MI 48503	Flint, MI 48506
# 3	7-11 Food Store	Mattress Savers	O'Rielly Auto Parts
	3302 S. Dort Hwy	3124 S. Dort Hwy.	3316 S. Dort Hwy
	Flint, MI 48507	Flint, MI 48507	Flint, MI 48507
# 4	Taco Bell Restaurant	Rite Aid Pharmacy	McFall's Collision
	3606 Courtna Rd.	3521 Courtna Rd.	3614 Courtna Rd
	Flint, MI 48532	Flint, MI 48532	Flint, MI 48532
# 5	7-11 Food Store	Serverance Service	Ambassador Bar
	2501 Flushing Rd.	2434 Flushing Rd.	1107 N. Chevrolet Ave.
	Flint, MI 48504	Flint, MI 48504	Flint, MI 48504
# 6	Salem Housing	B & P Gas Station	Hinky Dinky Market
	3216 M.L. King Blvd.	3317 M.L. King Blvd.	3110 M.L. King Blvd.
	Flint, MI 48505	Flint, MI 48505	Flint, MI 48505
# 7	Rite Aid Pharmacy	Urban League of Flint	Clio Rd. Coin Laundry
	5018 Clio Rd.	5005 Cloverlawn Dr.	4930 Clio Rd.
	Flint, MI 48504	Flint, MI 48504	Flint, MI 48504
# 8	North Flint Automotive	Al & Jerry's Mini Mart	Hutchinson's Food & Drug
	6204 N. Saginaw St.	6101 N. Saginaw St.	6509 N. Saginaw St.
	Flint, MI 48505	Flint, MI 48505	Flint, MI 48505
W.S.	West Side Reservoir & Pump Station	Water Main Sampler	Midway Market
	1416 Dupont St.	1430 Dupont St.	1360 Dupont St.
	Flint, MI 48503	Flint, MI 48504	Flint, MI 48504
C.S.	Cedar Street Reservoir & Pump Station	The Print Shop	City of Flint - Service garage
	1100 Cedar St.	1035 Ann Arbour St.	702 W. 12th St.
	Flint, MI 48503	Flint, MI 48503	Flint, MI 48503
Sta. #2 (II)	Water Plant Control Station #2	Baxter & Potter Rd. Control Station	Water Plant Laboratory Tap
	4500 N. Dort Hwy	G 12233 E. Potter Rd.	4500 N. Dort Hwy
	Flint, MI 48505	Davison, MI 48423	Flint, MI 48505
B&P	Baxter & Potter Rd. Control Station	Not Applicable*	Water Plant Control Station #2
	G 12233 E. Potter Rd.		4500 N. Dort Hwy
	Davison, MI 48423		Flint, MI 48505

* Baxter & Potter Rd. Control Station is the point at which The City of Flint takes control (& has access) on the pipeline.

Normal Sampling Frequency

Sites # 1 - # 8

Samples are collected twice weekly.

Usually collected on Wednesday by a lab analyst, & Thursday by a operator

W.S. & C.S.

Samples are collected Monday - Friday.

Usually collected along with sites # 1 - # 8 on Wednesday & Thursday to complete "city run".

Sta II and B&P

Samples are collected daily.

Positive Sample Protocol

Total Coliform Positive Sample:

- I. If a routine sample is positive for total coliform bacteria, notify Laboratory Supervisor immediately, and collect 3 repeat samples within 24 hours of determining the result. 1 repeat sample should be from the tap where the original total coliform –positive was taken. Repeat samples shall also be collected from upstream and downstream sites within 5 service connections of the original sampling site.
- II. If repeat samples are total coliform negative, no further sampling is required. Positive result and repeat results will be entered in the Monthly Operation Report (MOR).
- II. If 1 or more of the repeat samples in the set is total coliform positive, Notify Laboratory Supervisor, and collect an additional set of repeat samples. Laboratory Supervisor will notify Michigan DEQ with 24 hours or the next business day after learning the results, to determine further action.

Fecal Coliform Positive Sample:

- I. If a routine sample is positive for fecal coliform bacteria, notify Laboratory Supervisor, who will notify the DEQ immediately. Collect 3 repeat samples within 24 hours of determining the result. 1 repeat sample should be from the tap where the original fecal coliform –positive was taken. Repeat samples shall also be collected from upstream and downstream sites within 5 service connections of the original sampling site.

Rennaker, Joanne (DEQ)

From: Sygo, Jim (DEQ)
Sent: Friday, November 20, 2015 1:51 PM
To: Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Cc: Krisztian, George (DEQ)
Subject: December 11th meeting in Flint

Please hold your calendars open for a meeting with Flint, their Consultants and the EPA Task Force. The topic will be optimizing corrosion control of the KWA water that will be coming on line.

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Friday, November 20, 2015 1:15 PM
To: Sygo, Jim (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ); Shekter Smith, Liane (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Feuerstein, Heather (DEQ); Copen, Leigh (DEQ)
Cc: Natasha Henderson (nhenderson@cityofflint.com)
Subject: Correspondence to the city of Flint

Importance: High

Please ensure that any communication that we have with the city of Flint includes a cc to Natasha Henderson. Please forward this e-mail to anyone who regularly corresponds with the city.

I have copied Natasha on this e-mail so that you have her address.

Thank you!
George

George L. Krisztian
Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
Desk ph (517) 284-6719
Cell ph (517) 420-5897

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, November 19, 2015 6:16 PM
To: lytle.darren@epa.gov; Schock, Michael (Schock.Michael@epa.gov)
Cc: Sygo, Jim (DEQ); Robert Kaplan (kaplan.robert@epa.gov); Prysby, Mike (DEQ); Krisztian, George (DEQ); Benzie, Richard (DEQ); burke.thomas@epa.gov
Subject: Corrosion Control Treatment Example Study
Attachments: Flint CCT Operation Letter 10-30-15.pdf; image2015-11-03-155158.pdf

Darren and Mike,

The City of Flint and their engineering consultant would like EPA to provide a previously approved example of an optimal corrosion control treatment evaluation completed for a water treatment plant when full scale testing of the new source water was not available.

This is in an effort to assist the City of Flint regarding the required corrosion control treatment evaluation of the City's future change in source water to Lake Huron supplied by the Karegnondi Water Authority at the City of Flint Water Treatment Plant, as outlined in the Department's October 30, 2015 letter to the City, and in accordance with the November 3, 2015, EPA Memorandum *Lead and Copper Rule Requirements for Optimal Corrosion Control Treatment for Large Drinking Water Systems*, both attached.

While the later part of the EPA memo discusses systems that plan to disconnect from a supplier that had installed corrosion control treatment to determine the OCCT for the new source (and in the case of the City of Flint, new treatment), the guidance document that is referenced in this memo appears to focus only on existing systems where full-scale treatment evaluation is possible, with no apparent guidance for new systems or systems that disconnect from their supplier prior to their source and treatment change.

Your assistance regarding this matter is greatly appreciated.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as PO_4 , and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as PO_4 . As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as PO_4 (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

As part of the City water system operations, the City shall conduct:

- **Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as PO_4**
- **Daily monitoring of additional orthophosphate dosage, as PO_4**
- **Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as PO_4**

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

Enhanced Water Quality Parameter Monitoring

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as CaCO_3), Calcium (mg/L as Ca^{2+}), and orthophosphate (mg/L PO_4). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations, the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

- Turbidity (NTU)	- Calcium (mg/L as Ca^{2+})
- Iron (mg/L)	- Chloride (mg/L as Cl^-)
- Orthophosphate (mg/L PO_4)	- Temperature (Celcius)
- pH	- Conductivity (mS)
- Total Alkalinity (mg/L as CaCO_3)	

In addition to the 10 locations, the entry point to the distribution system should be one of the locations for enhanced water quality parameter monitoring.

If orthophosphate residual levels less than 3.1 mg/L as PO_4 (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as PO_4 (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

Corrosion Control Treatment Test Loops

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. The U.S. EPA has also offered to provide analytical services to support this investigative effort. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or lytle.darren@epa.gov.

Lead Service Line Verification Sampling

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for samples meeting the criteria for inclusion in the 90th percentile calculation for lead and copper compliance must be completed by a certified laboratory.

Mr. Mike Glasgow

3

October 30, 2015

Customer Household Exposure Assessment

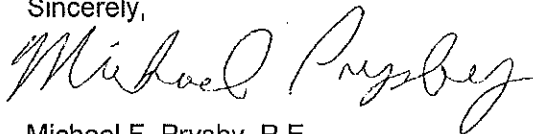
The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis samples meeting the criteria for inclusion in the 90th percentile calculation for compliance purposes for lead and copper must be completed by a certified laboratory.

Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance
517-290-8817

cc: Mr. Brent Wright, City of Flint
Mr. Howard Croft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Darren Lytle, U.S. EPA
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.
Mr. James Henry, Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

NOV 03 2015

MEMORANDUM

SUBJECT: Lead and Copper Rule Requirements for Optimal Corrosion Control Treatment for Large Drinking Water Systems

FROM: Peter C. Grevatt, Director
Office of Ground Water and Drinking Water

A handwritten signature in black ink, appearing to read "P.C. Grevatt".

TO: EPA Regional Water Division Directors, Regions I-X

This memorandum addresses certain concerns raised about the application of the 1991 Lead and Copper Rule, specifically the requirements pertaining to maintenance of optimal corrosion control treatment, in situations in which a large water system ceases to purchase treated water and switches to a new drinking water source. These concerns have been raised most recently in regard to the drinking water system in Flint, Michigan, where the water system was disconnected from the Detroit Water and Sewerage Department, which provided corrosion control treatment for Lake Huron source waters, and instead began distributing water from the Flint River. This type of situation rarely arises and the language of the LCR does not specifically discuss such circumstances. After reviewing the rule with our Office of General Counsel, it appears that there are differing possible interpretations of the LCR with respect to how the rule's optimal corrosion control treatment procedures apply to this situation, which may have led to some uncertainty with respect to the Flint water system. This memorandum clarifies how the LCR applies to this situation and eliminates the uncertainty for water systems and primacy agencies that may face these circumstances in the future.

It is important for large systems and primacy agencies¹ to take the steps necessary to ensure that appropriate corrosion control treatment is maintained at all times, thus ensuring that public health is protected. This memorandum focuses on those steps and clarifies, on a prospective basis, how EPA interprets the LCR corrosion control requirements and how primacy agencies should apply these requirements to large public water systems before, during and after making a significant change in source water, including switching from purchased water to a new source.

Under the LCR, all large systems (those serving more than 50,000 persons), whether purchasing water or not, must have completed a series of steps to either optimize the corrosion control treatment or be deemed to have optimal corrosion control treatment (OCCT) by 1998. 40 CFR 141.81. Key steps for

¹ The term "primacy agency" refers to the State, tribe or U.S. Environmental Protection Agency regional office having jurisdiction over, and primary enforcement responsibility for, a given public water system.

optimizing corrosion control include monitoring, corrosion control studies, installation of treatment, follow-up sampling and specification by the primacy agency of water quality parameters (WQPs) for monitoring corrosion control. The LCR requires any large system that has met the OCCT requirements through the installation of corrosion control treatment to continue operating and maintaining the treatment and to continue meeting the WQPs established by the primacy agency. 40 CFR 141.81(b) and 141.82(g). Systems deemed to have OCCT without the installation of corrosion control treatment are not subject to this requirement. However, they are required to notify the primacy agency in writing of any upcoming changes in treatment or source and request that the primacy agency modify its determination of the OCCT and WQPs applicable to the system. The primacy agency must then review and approve the change and designate OCCT and WQPs prior to its implementation by the system. 141.81(b)(3). Similarly, systems subject to reduced monitoring or monitoring waivers must notify the primacy agency of any upcoming changes in treatment or source and the primacy agency must subsequently review and approve it. EPA recommends that systems that are not subject to a notification requirement also notify the primacy agency prior to the addition of a new source or treatment and request the primacy agency to modify its determination of the optimal corrosion control and WQPs applicable to the system.

Due to the unique characteristics of each PWS (e.g., source water, existing treatment processes, distribution system materials) it is critical that public water systems, in conjunction with their primacy agencies and, if necessary, outside technical consultants, evaluate and address potential impacts resulting from treatment and/or source water changes. It is also critical for public water systems to conduct ongoing monitoring to ensure compliance with OCCT prior to, during and after a source or treatment change. The rearrangement of a system's existing configuration may trigger the need for OCCT adjustments and establishment of appropriate WQPs. Primacy agencies should work with systems that plan to disconnect from a supplier that had installed corrosion control treatment to determine the OCCT for the new source and establish WQPS for that treatment instead of using the OCCT and WQPs established for the previous source. This will allow a system that ceases to purchase treated water to stay in compliance with any applicable requirements pertaining to OCCT and ensure protection of public health during and after the change in source. EPA has developed a guidance manual² specifically focusing on evaluation of corrosion control treatment options and optimization of full-scale treatment to assist water systems and primacy agencies with these efforts. EPA is currently preparing an updated version of the manual, which we anticipate will be released in February 2016.

The key to identifying and mitigating potential problems is to ensure effective collaboration between the public water system and the primacy agency. Corrosion control treatment can come in many forms. For this reason, it is important to conduct a system-wide assessment prior to any source water and/or treatment modifications and to identify existing or anticipated water quality, treatment or operational issues that may interfere with or limit the effectiveness of corrosion control treatment optimization or re-optimization.

If you have additional questions or concerns, please contact me or have your staff contact Maria Lopez Carbo, Chief of the Protection Branch, in the Office of Ground Water and Drinking Water, at lopez-carbo.maria@epa.gov.

² U.S. Environmental Protection Agency. *Lead and Copper Rule Guidance Manual, Volume II: Corrosion Control Treatment*. Office of Water. EPA 811-B-92-002. 1992. Available at: <http://nepis.epa.gov/Exec/ZipPDF.cgi?Dockey=91019DM4.txt>.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, November 17, 2015 4:57 PM
To: rbincsik@cityofflint.com
Cc: Prysby, Mike (DEQ)
Subject: Table
Attachments: Flint LCR Site Reporting History.pdf

Rob,

Attached is an electronic copy of the table per your request.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov

City of Flint Lead and Copper History																				
All results in parts per million, mg/L																				
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
3714 Beecher Rd.	1	L	C														1LC	498	(n/a)	
3714 Beecher Rd.	1	L	C,P														1LC/P	498	(n/a)	
318 Marquette	1	L	G	1LG	1LG													675	(n/a)	
416 Marquette	1	L	C					1LC										757	(n/a)	
911 Hughes	1	L	C							1LC	1LC							977	(n/a)	
2111 Brownell Blvd.	1	L	C					1LC										3725	(n/a)	
2201 Brownell	1	L	G	1LG	1LG													3800	(n/a)	
2455 Thomas	1	L	G									1LG						4265	(n/a)	
2463 Thomas	1	L	G	1LG	1LG													4267	(n/a)	
2467 Thomas	1	L	G			1LG	1LG	1LG	1LG	1LG								4269	(n/a)	
2471 Norbert	1	L	G,C			1LG/C	1LG/C	1LG/C	1LG/C	1LG/C								4272	(n/a)	
2512 Altoona	1	L	G									1LG						4306	(n/a)	
2922 Barth St.	1	L	C									1LC	1LC	1LC				5536	(n/a)	
3722 Van Buren	1	L	G,P									1LG/P						8048	(n/a)	

All results in parts per million, mg/L L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
920 Stocker St.	1	L	P													1LP	1LP	1062	copper	
1020 Wellman	1	L	C									1LC	1LC					1481	copper	
1809 W. Home Ave.	1	L	no data													1L		3178	copper	
1810 W. Hobson Ave.	1	L	no data													1L		3193	copper	
1914 W. Home Ave.	1	L	no data													1L		3433	copper	
2020 Crooked Ln.	1	L	C,P														1LC/P	3643	copper	
2230 Winona	1	L	C					1LC	1LC	1LC	1LC							3922	copper	
2559 Norbert	1	L	C									1LC						4516	copper	
2560 Thomas St.	1	L	no data													1L		4518	copper	
2574 Nolen	1	L	C					1LC										4538	copper	
2619 Thomas	1	L	G							1LG	1LG							4634	copper	
2730 Coventry Ct.	1	L	no data													1L		4957	copper	
2806 Norbert St.	1	L	no data													1L		5127	copper	
2810 Kellar Ave.	1	L	no data													1L		5143	copper	

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2470 Nolen Dr.	1	L	C					1LC										4271	lead-copper	Confirmed
2527 Altoona	1	L	C									1LC						4406	lead-copper	Confirmed
2534 Norbert	1	L	C									1LC						4441	lead-copper	Confirmed
2615 Trumbull Ave.	1	L	C,P														1LC/P	4614	lead-copper	Confirmed
1002 Durand St.	1	L	no data													1L				
1006 Kensington	1	L	no data													1L				
1016 Ingleside Ave.	1	L	C,P														1LC/P			
1017 Simcoe Ave.	1	L	C											1LC						
1021 S. Franklin Ave.	1	L	no data													1L				
1100 Stockton St.	1	L	C,P										1LC/P			1L				
1109 Kensington Ave.	1	L	no data													1L				
111 Prospect	1	L	C,P										1LC/P							
1125 Barrie Ave	1	L	no data													1L				
1130 Simcoe Ave.	1	L	no data													1L				

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Sample Location	Sample Category	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
1150 Woodside Dr.	1	L	P														1LP			
1205 Blanchard Ave.	1	L	C,P														1LC/P			
1210 Campbell St.	1	L	C,P									1LC/P								
1220 Beard St.	1	L	no data													1L				
1220 Decker St.	1	L	P														1LP			
1223 Campbell St.	1	L	G										1LG			1L				
1224 Decker St.	1	L	C,P														1LC/P			
1248 Niagra	1	L	G									1LG								
1367 Washington Ave.	1	L	P														1LP			
1372 Washington Ave.	1	L	C,P														1LC/P			
1379 Washington Ave.	1	L	P														1LP			
1383 Washington Ave.	1	L	C,P														1LC/P			
1401 Gainey Ave.	1	L	no data													1L				
1401 Maplewood	1	L	G			1LG	1LG	1LG	1LG	1LG	1LG									

All results in parts per million, mg/L																				
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Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
1616 Durand St.	1	L	no data													1L				
1623 Neome Dr.	1	L	no data													1L				
1636 Blackberry Lane	1	None	None											1						
1651 Woodlawn Park Dr.	1	L	G											1LG	1LG	1L				
1701 Forest Hill	1	L	L,P										1LL/P							
1701 Marquette Dr.	1	L	C,P													1LC/P				
1701 Pennsylvania	1	L	G,C				1LG/C													
1720 Davison Rd.	1	L	no data													1L				
1721 Chelsea Circle	1	L	no data													1L				
1725 Lincoln Ave.	1	L	no data													1L				
1730 Overhill Dr.	1	L	C,P													1LC/P				
1801 Greenbriar Lane	1	L	C											1LC						
1805 Proctor	1	L	G			1LG		1LG	1LG											
1805 Ramsay Blvd.	1	L	no data													1L				

All results in parts per million, mg/L																				
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
1807 Oren Ave.	1	L	P														1LP			
1809 E. Court Street	1	L	C,P												1LC/P					
1809 Lynbrook	1	L	P													1LP	1LP			
1809 Stevenson St.	1	L	P														1LP			
1818 Rock Creek Ln.	1	L	C,P														1LC/P			
1901 Crestbrook Ln.	1	L	no data														1L			
1901 Montclair Ave	1	L	no data														1L			
1906 Knapman	1	L	C								1LC									
1910 Ramsay Blvd	1	L	no data														1L			
1911 Corry St.	1	L	no data														1L			
1914 Penbrook Lane	1	L	C,P											1LC/P	1LC/P	1L	1LP			
1922 Bagley	1	L	C						1LC											
1922 Barth	1	L	G	1LG	1LG	1LG		1LG												
2006 Aitken Ave.	1	L	no data														1L			

All results in parts per million, mg/L																				
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
2625 Pinetree Dr.	1	L	C												1LC					
2648 Swayze	1	L	C,P												1LC/P					
2701 Yale	1	L	C			1LC	1LC	1LC												
2705 Yale	1	L	C			1LC														
2706 Cumings	1	L	C						1LC	1LC	1LC									
2709 Yale	1	L	C			1LC	1LC		1LC											
2709 Zimmerman	1	L	no data													1L				
2710 Yale	1	L	C			1LC		1LC	1LC	1LC	1LC									
2713 Yale	1	L	C			1LC	1LC		1LC	1LC	1LC									
2714 Yale	1	L	C			1LC	1LC													
2717 Yale	1	L	C			1LC	1LC													
2718 Yale	1	L	C			1LC	1LC	1LC	1LC											
2721 Westwood Pkwy	1	L	no data													1L				
2721 Yale	1	L	C			1LC	1LC													

All results in parts per million, mg/L L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
2730 Westwood Pkwy	1	L	no data													1L				
2734 Yale	1	L	C			1LC	1LC	1LC												
2751 Swayze	1	L	L			1LL	1LL	1LL	1LL											
2762 Yale	1	L	C										1LC							
2801 Reynolds	1	L	no data													1L				
2801 Yale	1	L	C			1LC							1LC							
2802 Westwood Pkwy.	1	L	no data													1L				
2821 Hillcrest	1	L	C										1LC							
2829 Yale St.	1	L	no data													1L				
2920 N. Dexter St.	1	L	no data													1L				
2920 Parkside Dr.	1	L	no data													1L				
2937 Oklahoma	1	L	G	1LG	1LG															
2937 Oklahoma	1	L	C				1LC													
3005 Montana Ave.	1	L	C,P												1LC/P					

All results in parts per million, mg/L																		Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15			
353 Robbie Ln.	1	L	C,P														1LC/P			
357 Robbie Ln.	1	L	C														1LC			
3602 Camden	1	L	P									1LP								
3602 N. Term St.	1	L	C,P										1LC/P							
3613 Cassius	1	L	C	1LC	1LC															
3614 Branch	1	L	C,P										1LC/P							
3704 Circle	1	L	C	1LC	1LC															
3706 Leith	1	L	C								1LC									
3713 HIRrick St.	1	L	C,P										1LC/P							
3714 Circle	1	L	C	1LC	1LC															
3714 Leith	1	L	C						1LC	1LC	1LC	1LC								
3718 Dolphaine Ln.	1	L	no data													1L				
3727 Maryland Ave.	1	L	no data													1L				
3737 Worchester Dr.	1	L	no data													1L				

All results in parts per million, mg/L																		Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Category	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15			
4317 Pengelly	1	L	C	1LC	1LC															
502 Crapo	1	L	C	1LC	1LC	1LC	1LC	1LC	1LC											
508 Avon	1	L	C			1LC	1LC	1LC	1LC											
509 Mathewson	1	L	L			1LL	1LL	1LL	1LL											
518 Frost	1	L	no data													1L				
530 Leta	1	L	C	1LC	1LC															
5303 Custer Ave.	1	L	C,P														1LC/P			
5410 Edwards Ave.	1	L	C										1LC							
547 Copeman Blvd.	1	L	P														1LP			
5801 Edwards Ave.	1	L	C							1LC										
605 Burroughs	1	L	G,C										1LG/C							
611 Weller	1	L	C	1LC	1LC	1LC	1LC	1LC	1LC	1LC	1LC									
616 Carrill Ct. #2	1	L	C											1LC						
617 Lyon Place	1	L	G,C										1LG/C							

All results in parts per million, mg/L																				
L=Lead, C=Copper, G=Galvanized, P=Plastic																				
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria
912 Lafayette	1	L	C	1LC	1LC															
912 Lexington Ave.	1	L	P														1LP			
912 Waldman Ave	1	L	no data													1L				
915 E. 7th Street	1	L	G									1LG								
919 Blanchard	1	L	G	1LG	1LG	1LG	1LG	1LG	1LG	1LG	1LG									
921 E. 7th Street	1	L	G									1LG								
924 E. 7th Street	1	L	C									1LC								
925 E. 7th Street	1	L	G									1LG								
927 Kensington Ave.	1	L	no data													1L				
928 Durand	1	L	no data													1L				
928 Garland	1	L	G/C								1LG/C									
932 E. 7th Street	1	L	G									1LG								
937 E. 7th Street	1	L	G									1LG								
939 Alvord St.	1	L	C										1LC							

All results in parts per million, mg/L																					
L=Lead, C=Copper, G=Galvanized, P=Plastic																					
Sample Location	Sample Categor	Service Line	Building Plumbing	6/92	12/92	6/97	12/97	12/98	6/99	2000	2001	2002	2005	2008	2011	12/14	6/15	Flint Index ID	Service Line Material	Justification of Lead Service Line and Tier 1 Criteria	
942 E. 7th Street	1	L	G									1LG									
983 Gainey Ave.	1	L	no data													1L					

Rennaker, Joanne (DEQ)

From: Shaler, Karen (DEQ)
Sent: Saturday, November 14, 2015 6:54 PM
To: Shekter Smith, Liane (DEQ); Krisztian, George (DEQ)
Cc: Prysby, Mike (DEQ); Thelen, Mary Beth (DEQ); Busch, Stephen (DEQ); Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Anderson, Madhu (DEQ)
Subject: RE: Action Steps Reporting for Week of 11/9 - 11/13

That's because I was swamped all week and didn't have time to create it yet, but I will. ☺

From: Shekter Smith, Liane (DEQ)
Sent: Saturday, November 14, 2015 1:15 PM
To: Krisztian, George (DEQ)
Cc: Prysby, Mike (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Busch, Stephen (DEQ); Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Anderson, Madhu (DEQ)
Subject: Action Steps Reporting for Week of 11/9 - 11/13

Karen – I looked for the Action Steps chart in the folder and couldn't find a chart for this week. Not sure why not.....

Below is an update of the Action Steps worked on during the week of November 9th - November 13th.

Action Step No. 2: Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund:

Meeting scheduled for November 20th between Executive Division staff and program staff to discuss draft changes.

Action Step No. 3: Assist After Action Review Panel: *(not sure whether Madhu has been filling this out or not)*

Draft Timeline shared with Task Force *(check with Madhu for the date)*.

Outline of DEQ Actions drafted for delivery to Task Force.

Action Step No. 7: Follow-up with city of Flint regarding corrosion control treatment and their plans to address requirements and options provided for in 10/30/15 DEQ letter:

DEQ staff discussed corrosion control dosages and monitoring requirements in more detail with the city and their consultant during the Technical Advisory Committee (TAC) meeting on 11/9/2015. Orthophosphate dosage concerns brought to the table by the city's consultant were addressed by DEQ and EPA staff.

Action Step No. 8: Follow-up with the city regarding installation of corrosion control:

DEQ staff followed-up with city during the TAC meeting regarding installation of corrosion control confirmed that the chemical feed pumps have been ordered and delivery is approximately two weeks out. WTP operators are currently installing the feed system piping and water booster pumps. The city

anticipates have the corrosion control feed system installed and ready for operation by the end of this month.

Action Step No. 9: Review Monthly Operation Reports (MORs) for Standby Operation of Flint WTP with the city of Flint; draft letter to city of Flint documenting Standby Operation requirements:

DEQ staff has drafted a letter that establishes standby operation (test-run) requirements for the Flint WTP based upon the city's previous test run MORs. The draft letter also discusses the potential for Flint to obtain a limited supply of raw water directly to the WTP from KWA (prior to spring 2016) for treatment evaluation. The draft letter will be finalized and sent to the city early next week.

Action Step No 10: Work with KWA and other agencies to address bottleneck issues; check weekly for status updates:

DEQ staff discussed the most recent stop work orders issued by the Lapeer County Road commission with Genesee County during the TAC meeting. The county is continuing to install the pipeline and is working with the road commission to correct the soil erosion control issues. The county has not expressed a concern of this delaying their construction schedule.

Action Step No 11: Continue evaluating city of Flint Service Line Record status and comparison to sampling pool:

DEQ's letter was sent to the city on 11/9/2015. The letter requests the city to provide additional information/documentation concerning discrepancies between the water service line material reported in the Lead/Copper Reporting forms and the water service line material reported in digitized water service index cards. The city must also complete the correlation for all of the remaining lead/copper sampling locations that were used since the start of monitoring under the LCR in 1992. Any additional further discrepancies must be explained. The city must complete this task by December 29, 2015.

Action Step No. 13: Develop draft sampling protocol for residential exposure assessment for DHHS:

Draft protocol shared with DHHS on November 10th.

Action Step No 15: Attend TAC meeting on 11/9/15

DEQ staff, Jim Sygo and Michael Prysby attended the TAC meeting on 11/9/15. Mr. Prysby participated in the meeting as described in the Action Steps above. Mr. Sygo presented DEQ's findings of the results of the lead sampling conducted at the Freeman Elementary school.

Action Step No. 17: Conduct Plumbing Assessments at Durant-Tuuri-Mott Elementary and Central Kitchen:

DEQ and DLARA staff completed plumbing assessments at both locations on Friday, November 13th.

Action Step No 18: Conduct sampling at Durant-Tuuri-Mott Elementary and Central Kitchen:

DEQ staff are scheduled to complete this task on Saturday, November 14th.

Rennaker, Joanne (DEQ)

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Sent: Saturday, November 14, 2015 1:15 PM
To: Krisztian, George (DEQ)
Cc: Prysby, Mike (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Busch, Stephen (DEQ); Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Anderson, Madhu (DEQ)
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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, November 13, 2015 5:00 PM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ)
Subject: Action Steps Week of 11/9 - 11/13

George,

Below is an update of the Action Steps worked on during the week of Nov. 9th.

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DEQ staff followed-up with city during the TAC meeting regarding installation of corrosion control confirmed that the chemical feed pumps have been ordered and delivery is approximately two weeks out. WTP operators are currently installing the feed system piping and water booster pumps. The city anticipates have the corrosion control feed system installed and ready for operation by the end of this month.

Action Step No. 9: Review Monthly Operation Reports (MORs) for Standby Operation of Flint WTP with the city of Flint; draft letter to city of Flint documenting Standby Operation requirements:

DEQ staff has drafted a letter that establishes standby operation (test-run) requirements for the Flint WTP based upon the city's previous test run MORs. The draft letter also discusses the potential for Flint to obtain a limited supply of raw water directly to the WTP from KWA (prior to spring 2016) for treatment evaluation. The draft letter will be finalized and sent to the city early next week.

Action Step No 10: Work with KWA and other agencies to address bottleneck issues; check weekly for status updates:

DEQ staff discussed the most recent stop work orders issued by the Lapeer County Road commission with Genesee County during the TAC meeting. The county is continuing to install the pipeline and is working with the road commission to correct the soil erosion control issues. The county has not expressed a concern of this delaying their construction schedule.

Action Step No 11: Continue evaluating city of Flint Service Line Record status and comparison to sampling pool:

DEQ's letter was sent to the city on 11/9/2015. The letter requests the city to provide additional information/documentation concerning discrepancies between the water service line material reported in the Lead/Copper Reporting forms and the water service line material reported in digitized water service index cards. The city must also complete the correlation for all of the remaining lead/copper sampling locations that were used since the start of monitoring under the LCR in 1992. Any additional further discrepancies must be explained. The city must complete this task by December 29, 2015.

Action Step No 15: Attend TAC meeting on 11/9/15

DEQ staff, Jim Sygo and Michael Prysby attended the TAC meeting on 11/9/15. Mr. Prysby participated in the meeting as described in the Action Steps above. Mr. Sygo presented DEQ's findings of the results of the lead sampling conducted at the Freeman Elementary school.

Action Step No 18: Conduct sampling at Durant-Tuuri-Mott Elementary and Central Kitchen:

DEQ staff are scheduled to complete this task on 11/14/2015.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Wright, Michael <Wright.Michael@epa.gov>
Sent: Thursday, November 12, 2015 7:13 PM
To: Howard Croft; Amy Hovey; Andy Leavitt; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: RE: TAC_Request for Input

Howard

This looks fine to me, although I'm not sure how effective question 4c will be to the end users of the data, since "any kind of additive" is unclear to me. Is this intended to capture point of use (POU) filtration devices that use activated carbon like Brita faucet mounted filters? If so, I'd encourage you to put language specific to what the public will understand (brand names usually do the trick). My past understanding is that some POU devices will have varying levels of effectiveness at lead removal and that this may even be dependent on the type of device (faucet-mounted device vs pitcher-style). I'm just not up on the literature, nor did I get a chance to review NSF ratings for Lead removal, including the ones that are being passed out in Flint. The long and short of it, if they are effective at Lead removal, then it might fairly accurately represent a typical concentration (when filter properly maintained), but may not capture if other sinks used for water consumption, etc. So, it may not reflect what is coming out of similar (faucet-mounted) unfiltered residential samples with comparable piping.

Mike

From: Howard Croft [<mailto:hcroft@cityofflint.com>]

Sent: Wednesday, November 11, 2015 12:14 PM

To: Amy Hovey ; Andy Leavitt ; Anthony Chubb ; Brent Wright ; Lytle, Darren ; Dayne Walling ; Deborah Higgins ; donna. cole ; dykemal ; Eden Wells (DHHS) ; edwardsm ; George Krisztian (DEQ) ; Gerald (Jed) Natzke ; Howard Croft ; James Henry ; Jamie Gaskin ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kevin J. Keane ; Kirk Smith ; larry.koehler@mcc.edu ; Laura Sullivan ; Lawrence Reynolds ; Lawrence Reynolds ; Michael Glasgow ; Schock, Michael ; Wright, Michael ; Mike Lane ; Mike Prysby (DEQ) ; MVALACAK@gchd.us ; Natasha Henderson ; Norb Birchmeier ; Pete Levine ; Robert Bincsik ; rosejo@msu.edu ; Russell Hudson ; Samir Matta ; Sean Kammer ; Shawn Patrick McElmurry ; Stephen Busch (DEQ) ; swalser@senatedems.org ; thompsons2@michigan.gov ; Warren Green

Subject: TAC_Request for Input

Advisory Team,

Given the holiday scheduling, we are looking at Wednesday December 9th at 2:00 as the best opportunity to hold our next Advisory meeting. Please provide us with feedback on whether or not this is a convenient time for you to attend, we will give priority to our EPA partners in the final scheduling of the meeting.

I am also including a copy of our new NO FLUSH instructions that are now on all of our test bottles being distributed along with a draft copy of a letter that we plan to send to all residents that have been tested under the previous protocol. We will wait for comments on the letter prior to distributing it publicly.

We now have our City Hall lobby Information window staffed along with two screens. One screen will display information on water, filters, and testing, the other will display a video sent to us that demonstrates installation procedures with different filters.

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, November 12, 2015 10:27 AM
To: Rosenthal, Adam (DEQ)
Subject: FW: Technical Advisory Team Information

Michael Prysby, P.E.
 District Engineer
 Office of Drinking Water and Municipal Assistance
 517 290-8817

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Subject: RE: Technical Advisory Team Information

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Subject: Re: Technical Advisory Team Information

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www.avast.com

Peter A. Levine, MPH
Executive Director
Genesee County Medical Society
4438 Oak Bridge Dr. Suite B
Flint, Mi. 48532
Phone: 810-7339925
Fax: 810-2303737
[email:plevine@gcms.org](mailto:plevine@gcms.org)

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Marc

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Subject: Re: Technical Advisory Team Information

Andy,

We changed the instructions late last week that called for flushing, all bottles are now going out with the new protocol attached. We are concerned that some people are still not removing filters from the tap so we are trying to focus on that aspect of communication as well..

On Tue, Nov 10, 2015 at 1:59 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:

Hi Howard,

Can you confirm when Flint will move away from the testing mode that includes flushing?

Thanks,

Andy

On Mon, Nov 9, 2015 at 6:20 PM Wright, Michael <Wright.Michael@epa.gov> wrote:

Howard:

Thanks for arranging the meeting today. I didn't catch all of what Natasha (and others) said on the line but I was intrigued when I heard her mention a fact sheet or some information on Lead that was taken from a city in MA. Can you/she forward that URL for our review and consideration?

During the last call, I also noted my concern regarding boil advisories during a lead emergency and wanted to provide a link that documented what I said about Lead (and nitrates for that matter) being concentrated upon heating.

http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf

Lastly, I couldn't hear who made the comment, but I agree that infants are likely the most vulnerable of concern. So, I was wondering if the clinicians/health practitioners in the room might consider partnering or spearheading an outreach effort to target expectant mothers with the Filters that are being provided. Not sure if this is best done via prenatal clinics, delivery hospitals, OB-GYN departments, or lactation management

specialists, etc. The public health practitioners might also be able to use this emergency as another reason to advocate breastfeeding (vs infant formula).

Thanks,
Mike

From: Howard Croft [mailto:hcroft@cityofflint.com]

Sent: Friday, November 06, 2015 3:48 PM

To: Amy Hovey <Amy.Hovey@mail.house.gov>; Andy Leavitt <aleavitt@senatedems.org>; Anthony Chubb <achubb@cityofflint.com>; Brent Wright <bwright@cityofflint.com>; Lytle, Darren <Lytle.Darren@epa.gov>; Dayne Walling <dwalling@cityofflint.com>; Deborah Higgins <DeborahC@mottchc.org>; donna. cole <donna.cole@genesys.org>; dykema <dykema@mich.gov>; Eden Wells (DHHS) <wellse3@michigan.gov>; edwardsm <edwardsm@vt.edu>; George Krisztian (DEQ) <krisztian@michigan.gov>; Gerald (Jed) Natzke <gdn2@aol.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jamie Gaskin <jgaskin@unitedwaygenesee.org>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwws.com>; Kevin J. Keane <KEVIN.KEANE@cmsenergy.com>; Kirk Smith <ksmith@flint.org>; larry.koehler@mcc.edu; Laura Sullivan <dr.laura2@gmail.com>; Lawrence Reynolds <LawrenceR@mottchc.org>; Lawrence Reynolds <reynolds@mottchc.org>; Michael Glasgow <mglasgow@cityofflint.com>; Schock, Michael <Schock.Michael@epa.gov>; Wright, Michael <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; MVALACAK@gchd.us; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo@msu.edu; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Sean Kammer <skammer@cityofflint.com>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Stephen Busch (DEQ) <BUSCHS@michigan.gov>; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green <jwgreen@lan-inc.com>

Subject: Technical Advisory Team Information

All,

Enclosed please find the weekly update along with the agenda for next weeks Technical Advisory Committee meeting. The time and location remain at City Hall on the 3rd floor at 2:00 pm. There is a conference call in number available and we have modified the speaker system to accommodate all those who call in. If there are any questions, please do not hesitate to contact me.

Dial-in Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

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Peter A. Levine, MPH
Executive Director
Genesee County Medical Society
4438 Oak Bridge Dr. Suite B
Flint, Mi. 48532
Phone: 810-7339925
Fax: 810-2303737
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Subject: Re: Technical Advisory Team Information

Andy,

We changed the instructions late last week that called for flushing, all bottles are now going out with the new protocol attached. We are concerned that some people are still not removing filters from the tap so we are trying to focus on that aspect of communication as well..

On Tue, Nov 10, 2015 at 1:59 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:

Hi Howard,

Can you confirm when Flint will move away from the testing mode that includes flushing?

Thanks,

Andy

On Mon, Nov 9, 2015 at 6:20 PM Wright, Michael <Wright.Michael@epa.gov> wrote:

Howard:

Thanks for arranging the meeting today. I didn't catch all of what Natasha (and others) said on the line but I was intrigued when I heard her mention a fact sheet or some information on Lead that was taken from a city in MA. Can you/she forward that URL for our review and consideration?

During the last call, I also noted my concern regarding boil advisories during a lead emergency and wanted to provide a link that documented what I said about Lead (and nitrates for that matter) being concentrated upon heating.

http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf

Lastly, I couldn't hear who made the comment, but I agree that infants are likely the most vulnerable of concern. So, I was wondering if the clinicians/health practitioners in the room might consider partnering or spearheading an outreach effort to target expectant mothers with the Filters that are being provided. Not sure if this is best done via prenatal clinics, delivery hospitals, OB-GYN departments, or lactation management specialists, etc. The public health practitioners might also be able to use this emergency as another reason to advocate breastfeeding (vs infant formula).

Thanks,
Mike

From: Howard Croft [mailto:hcroft@cityofflint.com]

Sent: Friday, November 06, 2015 3:48 PM

To: Amy Hovey <Amy.Hovey@mail.house.gov>; Andy Leavitt <aleavitt@senatedems.org>; Anthony Chubb <achubb@cityofflint.com>; Brent Wright <bwright@cityofflint.com>; Lytle, Darren <Lytle.Darren@epa.gov>; Dayne Walling <dwalling@cityofflint.com>; Deborah Higgins <DeborahC@mottchc.org>; donna. cole <donna.cole@genesys.org>; dykema <dykema@mich.gov>; Eden Wells (DHHS) <wellse3@michigan.gov>; edwardsm <edwardsm@vt.edu>; George Krisztian (DEQ) <krisztian@michigan.gov>; Gerald (Jed) Natzke <gdn2@aol.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jamie Gaskin <jgaskin@unitedwaygenesee.org>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwws.com>; Kevin J. Keane <KEVIN.KEANE@cmsenergy.com>; Kirk Smith <ksmith@flint.org>; larry.koehler@mcc.edu; Laura Sullivan <dr.laura2@gmail.com>; Lawrence Reynolds <LawrenceR@mottchc.org>; Lawrence Reynolds <reynolds@mottchc.org>; Michael Glasgow <mglasgow@cityofflint.com>; Schock, Michael <Schock.Michael@epa.gov>; Wright, Michael <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; MVALACAK@gchd.us; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo@msu.edu; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Sean Kammer <skammer@cityofflint.com>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Stephen Busch (DEQ) <BUSCHS@michigan.gov>; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green <jwggreen@lan-inc.com>

Subject: Technical Advisory Team Information

All,

Enclosed please find the weekly update along with the agenda for next weeks Technical Advisory Committee meeting. The time and location remain at City Hall on the 3rd floor at 2:00 pm. There is a conference call in number available and we have modified the speaker system to accommodate all those who call in. If there are any questions, please do not hesitate to contact me.

Dial-in Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, November 12, 2015 10:16 AM
To: 'bwright@cityofflint.com'
Cc: Michael Glasgow
Subject: WTP Sanitary Survey
Attachments: Flint WTP SS 2012.xls; Evalltr WTP Feb 2013.docx

Brent,

Attached is the Flint WTP Sanitary Survey and cover letter for your records.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

DEQ Office Address 1
DEQ Office Address 2
Phone:
Fax:

WSSN: 2310

Office of Drinking Water and Municipal Assistance
Lansing District Office

Water System Sanitary Survey
Flint Water Treatment Plant
Jan-13



FLINT WATER TREATMENT PLANT
SANITARY SURVEY
EVALUATION FORM

BASIC DATA

Name of Supply:	City of Flint	Review Dates: 12/13/2012 01/16/2013
WSSN:	2310	Reviewed By: MFP
<u>Mailing Address:</u> 1101 South Saginaw Street Flint, Michigan 48502		<u>Plant Address</u> 4500 North Dort Highway Flint, Michigan 48505

City Officials

Mayor: Dan Walling
 City Administrator: Mike Brown - EFM
 Utilities Director: Howard Croft
 Water Plant Superintendent: Brent Wright - Provisional Supt.
 Operator-In-Charge: Mike Glaskow - F-1
 Designated Backup Operator: - F-

Water Treatment Plant (WTP) Operators:

Brent Wright	F-2, S-3	Matt McFarland	F-3, S-3
Chris Koryciak	F-4	Tom Childes (Operation)	F-4
Robert Duby	F-4, S-4	Mike Glaskow (Lab)	F-1, S-3
Charles Yanta	F-3	Nicole Alexander (Lab)	F-3, S-4
Rodney Jackson	F-3, S-3	Mike Beckley (Maint)	F-4, S-4
Tim Bratton	F-4	Donald Echlin	F-4
Scott Dungee	F-4, S-4		

Distribution System Superintendent: Robert Bincsik - S-1
 Organizational Chart: See Appendix A

Wholesale Customers:

Population

Genesee County Drain Commissioner:	153,000 - combined GCDC wholesale and retail
City of Flint:	102,434 2010 Census

Total Population Served:	255,434

Percent Metered: 100%
 Percent Unaccounted:

Water System Construction Features & Dates:

The Flint WTP is a 36 MGD water treatment facility that has recently undergone a \$45 million rehabilitation project. The project allows the facility to serve as an emergency stand-by treatment plant. The WTP is not operated on a routine basis however, the facility can be placed into operation in the event that the single 72-inch transmission main (pipeline) serving Flint from the Detroit Water & Sewerage Department (DWSD) were to fail.

The city of Flint purchases bulk water from the DWSD and distributes it to the city and Genesee County. Portions of the treatment plant including Control Station No. 2, Dort Reservoir, and Pump Station No. 4 play a vital role in daily operation and transmittal of purchased water from DWSD to much of Flint's service area. Below is a summary of the most recent construction features at the Flint WTP. Copies of the construction permits for Segments 1-4 can be referenced in **Appendix B**.

1. Segment 1 WTP Rehab - Construction of new rapid mix and flocculation basins, interconnect structure, SCADA control, and boiler facility. 1999 - 2000
2. Segment 2 WTP Rehab - Construction of new primary clarifier structure 2000 - 2001
3. Segment 3 WTP Rehab - Construction of west solids contact unit for lime softening, 2 new lime slakers, four rapid gravity sand filters, new chemical feed room, two new intake traveling screens 2001 - 2002
4. Segment 4 WTP Rehab - construction of east solids contact unit for lime softening, 2 additional lime slakers, eight rapid sand gravity filters, and one ozone treatment facility. 2003 - 2005
5. Intermediate chlorination installed at primary clarifier outlet (used in Nov. 2010 WTP test run).
6. Temporary de-chlor system (drip system) installed in 2009. Used in 2009 pipeline emergency. The de-chlor system now uses calibrated EMI feed pumps and is located in the NW corner of Pump Station No. 4.

Is Vulnerability Assessment Available for review? Yes, available at the WTP

Is Emergency Response Plan Available for review? Yes, available at the WTP

Plant Personnel/Construction/Security comments:

Security provisions include: perimeter fencing, a guard building at the main entrance, surveillance cameras at the front desk and guard building, and intrusion alarms within the ozone building. The WTP is staffed during normal working hours, all building entrances are unlocked, and the main gate is open. After 4pm, staffing is limited to operations personnel, all entrances are locked, and the main

Pumpage Data (Million Gallons Per Day)

Year	MDD	ADD	AD - Max mo	min. day	G/C/D
2001	26.03	18.13			145
2002	26.44	18.45	21.8	15.65	148
2003	30.05	19.9	25.22	16.59	159
2004	23.06	16.86	19.89	15.33	135
2005	23.79	17.64		11.56	141
2006	24.55	16.19		13.28	130
2007	26.38	17.02		12.53	159
2008	18.66	15.23		10.06	145
2009	21.57	14.03		9.28	136
2010	17.5	14.09		10.95	138
2011	20.41	13.92		9.01	136

WATER TREATMENT PLANT

See **Appendix C** for a WTP flow diagram

Plant Design Capacity: 36 MGD

State Rated Capacity: To be determined

<u>Plant Metering</u>	<u>Y/N</u>	<u>Type/Location</u>
Raw Water:	Yes	Ultrasonic flowmeter after risewell in piping below lime feed rm.
Finished Water:	Yes	Venturi meter at the end of the filter confl. piping in filter gallery.
Backwash Water:	Yes	Pressure differential meter (similar to an ultrasonic meter) on main washwater line with readouts on each filter console and totalizer on SCADA.

Plant Water: Yes

Total Treated Water Storage 3.0 MG

Treatment Plant

Clearwell: None

Ground Storage: 3.0 MGAL Well just prior to Pump Station 4

Distribution System

Elevated Storage: 2.0 MGAL at WTP

Dort Reservoir: 20 MGAL ground storage at WTP

Cedar St. Res: 20 MGAL ground storage within distribution system

Westside Res: 12 MGAL ground storage within distribution system

Total (MG)

57.0 MGAL

Percent of Maximum Day:

#####

Emergency Supply/Interconnection:

Donaldson Road meter pit: westside of city via 12-inch connection

Orgould Station: station taken out of service however piping remains connected.

Others: Several other locations however, the interconnects are locked out.

Demand/Capacity/Storage Comments:

Flint purchases water from Detroit through a 120-inch transmission main from the Detroit Lake Huron WTP west to the Inlay Pump Station. From Inlay west water is transmitted through a 72-inch transmission main. Water reaches the Flint WTP beginning at Control Station (CS) #2. C.S. 2 monitors incoming pressure, flow rate, turbidity, and chlorine residual. The control station is equipped with a 60-inch and 36-inch flow control valve. Flow to PS #4 and the 3 MG well is directed through the 36-inch valve. The 60-inch valve is normally kept closed. Adequate turn-over of water in the Dort reservoir is accomplished by throttling the 36-inch valve at C.S. 2 thus augmenting some of the flow around C.S. 2 and through the Dort reservoir.

The Dort reservoir can be filled only from the 72-inch pipeline. WTP would like to gain the ability to pump directly from the WTP to Dort then thru to P.S. 4 which would require a finished water pump station.

There were two pipeline emergencies in 2009 that resulted in WTP treating Flint River water and distributing it to the city. The first emergency involved repair of a break along a compound curve in Genesee Road. The line was taken down and welded. The WTP supplied the city water for approximately 2 days. A boil water advisory was issued as a precaution since plant tap bacteriological samples could not be collected while the WTP was filtering to waste to the Flint River (prior to switch-over). The second emergency involved repair at the same location, however, a new section of pipe was installed instead of welding. The WTP distributed water to the city for approximately 3 days during the repair. A temporary intermediate chlorination system and a de-chlor system (drip-feed) were set-up and allowed chlorinated water to pass thru the filters for plant tap monitoring and confirmation of acceptable bacteriological samples. These measures allow the WTP to supply the city without having to issue a boil water advisory.

The WTP continues to conduct quarterly plant test runs. 4 test runs were conducted in 2009, followed by 3 in 2010, 3 in 2011, and 4 in 2012. Table 1 on the following page shows a summary of WQ data obtained during the treatment plant test runs since 2010.

The pipeline was taken out of service in 2012 to evaluate a potential repair and the WTP was placed into emergency operation. The city did not proceed with the repair at that time and the WTP did not distribute treated water.

TABLE 1 Test-Run: Water Quality

	Raw		Treated	
	Normal	Range	Normal	Range
Hardness, ppm	266	214 - 316	257	220 - 296
Turbidity, NTU	13	3.00 - 150	0.13	.07 - 0.47
Color				
Alkalinity, ppm	210	146 - 257	155	41 - 208
Total Col, cts/100 ml	*	*	*	*
TOC, ppm				
Nitrate, ppm				
Fluoride, ppm	0.18	0.15 - 0.22	0.19	0.13 - 0.21
TTHM, ppb				
HAA5, ppb				
pH	8.1	7.26 - 8.45	7.34	7.09 - 7.52

Monitoring Requirements: See Monitoring Schedule, **Appendix D**

Complete Chemical Analysis: See **Appendix E**

* See WTP Test-Run reports in **Appendix F**.

Comments:

The WTP filters are equipped with on-line continuous monitoring turbidimeters on each filter effluent line; however, plumbing changes were necessary since the WTP operates in filter to waste mode the majority of the time. Individual filter turbidities are obtained once every 4hrs with grab samples during each of the WTP test-runs. The WTP also has a combined filter effluent (CFE) turbidimeter, however, CFE monitoring cannot be conducted when the WTP operates in the filter to waste mode since the location of the turbidimeter is downstream of the filtered water discharge point.

Intake Facility

Name of Source:	Flint River
Source Capacity:	23 CFS (lowest 7-day mean flow 1933-1999)
Diameter of raw water intake pipe:	72-inch
Total Length	50 Ft
Intake/crib capacity:	36 MGD
Location (latitude/longitude):	43° 03.293 min N 83° 40.126 min W
Submergence:	4 Ft at 709 USGS (708 Ft - 710 Ft is typical range of river level elevation)
Entrance Velocity:	2.0 Ft/Sec at 36 MGD
Grating	2 1/2 inch x 1/2 inch at 1 1/2 inch on center bar racks
Zebra Mussel Control:	None
Historic Low Water Elevation:	NA - never less than 708 Ft USGS
Historic Low Water Flow:	NA - never less than 708 Ft USGS
Historic High Water Elevation	717 Ft USGS
Standby (Emergency) Intake?	None
Is Source Water Assessment Plan available?	Yes
Back flush provisions?	No

Comments:

Water flows through the intake by gravity to the traveling screens. The old traveling screens were replaced with two new US Filter traveling screens during the first segment of the WTP rehabilitation project. The screens are cleaned during each WTP test-run. A pull-up door is opened and a collection trough is exposed. WTP staff spray debris out of the trough using plant service water. The debris are bagged and sent to the local landfill for disposal.

Submergence at the intake was a topic of concern given the need to reduce the water level at Hamilton Dam. The Dam Safety Unit mandated a maximum depth at the dam of 705.25 ft. Water depth at the dam of 707.00 ft provided adequate pool depth at the WTP intake. Water levels and available pool depth were investigated in early 2009 and it was determined that sufficient pool depth was available at 705.25 ft water elevation to allow the intake to supply the WTP at its rated capacity; however, significant reduction in capacity occurred when the elevation was lowered to 704.75 ft.

Pumps and Pump Locations

<u>Purpose</u>	<u>Location</u>	<u>HP</u>	<u>Capacity</u>	<u>Type</u>	<u>Lubricant</u>	<u>Status</u>	<u>PM</u>
Low Service:							
#3	P.S. 4	250	30 MGD	HC	Yes	Op.	See comments
#4	P.S. 4	200	25 MGD	HC	Yes	Op.	See comments
#5	P.S. 4	150	20 MGD	HC -VFD	Yes	Op.	See comments
#6	P.S. 4	125	15 MGD	HC - VFD	Yes	Op.	See comments
Total Capacity			90 MGD				
Firm Capacity			60 MGD				
High Service:							
#1	P.S 4	800	20 MGD	HC	Yes	Inoperable	
#2	P.S 4	1000	25 MGD	HC	Yes	Not used	
#7	P.S 4	800	20 MGD	HC	Yes	Operable	
#8	P.S 4	800	20 MGD	HC	Yes	Operable	
#9	P.S 4		6 MGD	HC	Yes	Operable	
Total Capacity			46 MGD				
Firm			26 MGD				
Ferric Sludge:							
#1	WTP base	9	350 GPN	HC	Yes	Operable	Yes
#2	WTP base	9	350 GPN	HC	Yes	Operable	Yes
Lime Sludge:							
#1	WTP base	15	230 GPN	PC	Yes	Operable	Yes
#2	WTP base	15	230 GPN	PC	Yes	Not used	Yes
Filter Backwash: None							
Reclaim: Yes, see Ozone section for further discussion							
Sludge Disposal: Yes							

Comments:

Low Service: A Low Tox Turbine oil is used to maintain each pump motor. The upper portion of the pump motor also requires grease. Pump operation is maintained by WTP staff once every two hours while in operation and routine maintenance is performed once a month. Pump suction is isolated by gate valves and pump discharge is isolated by butterfly valves and all of the valves have been exercised. All four pumps are operational however, Pumps #3 and #4 are not a good match for test run treatment rates. These pumps are used during treatment start-up (filling basins, etc). Newer Allen Bradley switchgear (VFD controlled) is in place for Pumps #5 and #6 and these pumps are used during the plant test runs. Pumps #3 and #4 are controlled by original Westinghouse switchgear. The pump motors and switchgear are located on the main floor of Pump Station #4 and are not subject to flooding. The horizontal centrifugal pumps are located in the pump station sub-basement and are subject to flooding.

LS Pumps #3 and #4 should be operated periodically between WTP test runs to ensure that the pumps and switchgear remain in operating condition. Eventually, it may be worthwhile to replace the switchgear in order to increase the flexibility of operation of the low service pump station.

High Service: Low Tox Turbine oil is used to maintain the pump motor for pumps #1 and #2. Pumps 7, 8, and 9 are maintained with an Elmac 1263 high temperature grease. H.S. Pump #1 is burned out and cannot be operated. H.S. Pump #2's operating condition is unknown and this pump would be used only in an emergency situation. H.S. Pump #7 and #8 are in good operating condition and are throttled during emergency operation. H.S. Pump #9 has a lower capacity and the pump's main purpose is to recirculate water in the 3 MGAL Well. WTP staff are discussing with the city the possibility of replacing H.S. Pumps #1 and #2 with lower capacity VFD controlled pumps.

MDEQ Conclusions/Recommendations

Since H.S. Pump #1 is not operable and H.S. Pump #2 is for emergency use only, the total and firm pumping capacity of high service is limited to 46 MGD and 26 MGD respectively. The DEQ is comfortable with the total and firm capacity to meet Flint's water usage in the event of an emergency repair on the pipeline; however, the firm high service pumping capacity falls somewhat short in meeting the combined needs of Flint and Genesee County during an extended pipeline emergency.

The combined needs of Flint and Genesee County will soon be identified as the scope of the Karegnondi Water Authority (KWA) is finalized and Flint's long-term source of water is determined. These factors will determine the future use level of the high service pump station. When the outcome of Flint's long-term source of water and the KWA project are determined, the future use level of the pump station will need to be evaluated to determine the amount of high service pumping capacity and other station improvements that may be needed.

Sludge Pumps: These pumps are in good condition and are maintained on a regular basis. Both lime sludge pumps are in operating condition however, new pump controls are needed for Pump #2..

TREATMENT FACILITIES

Ozone Facility

Location: Immediately east of the main treatment plant - WTP II

Contact Basins: 3

Capacity: 12 MGD per contact basin

Ozone Generators: 2

O3 Concentration: 6%

O3 rate: 1300 Pounds/day per generator

Storage:

O2: 9000 gallon liquid oxygen 10 ft diameter double walled horizontal tank rated at 75 psi

N2: 540 gallon 5.5 ft diameter double walled vertical tank rated at 250 psi

O2 Vaporizer: 2 @ 12,000 scfh

Heaters: 2 @ 12,000 scfh to maintain minimum O2 temperatures

Diffusion System:

42 dome ceramic bonded fused alumina, fine bubble diffusers in each contractor basin (3 basins total or 126 diffusers)

Ozone Destruct System:

Sodium bi-sulfite feed system utilizing 3 LMI feed pumps each rated at 4.00 GPH @ 100 psi
An additional spare pump is provided for a total of 4 LMI pumps - C921-460S1.

Sodium bisulfite is stored as a 38% solution in 55-gallon barrels from PVS Knollwood. The compound is gravity fed to a calibration chamber prior to the metering pumps.

2 off-gas thermal-catalytic destruction units with a design capacity to reduce the O₃ concentration of the off-gas flow to less than 0.05 ppm. Each blower is rated at 306 scfm.

The ozone facility consists of 3 concrete contactor basins with each basin composed of one diffusion chamber divided into 2 cells by means of overflow and underflow baffle walls. Raw water is fed into the ozone building's pre-sedimentation chamber through a 48-inch main from the low service pumps. Three 36-inch influent piping to each contactor basin from the pre-sedimentation basin are provided. Ozone is fed into the first cell through the diffusion system located at the floor in a counter-current fashion. Ozone is fed into the second cell through a second diffusion system in a co-current fashion. The maximum flow is 1.5 scfm per diffuser. Each contact basin is metered (both rate of flow and totalizer).

Each of the three contact basins contain six contact chambers following the diffusion chamber. The size and contact times at 12 MGD for each portion of the contactor basin (diffusion cells and contact chambers) are summarized below for CT calculation purposes:

Diffusion Chamber Cell 1 -	805 Cu. Ft., 0.72 minutes
Diffusion Chamber Cell 2 -	805 Cu. Ft., 0.72 minutes
Contact Chamber, Compartment 1 -	1964 Cu. Ft., 1.76 minutes
Contact Chamber, Compartment 2 -	3592 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 3 -	3592 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 4 -	3692 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 5 -	3692 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 6 -	2760 Cu. Ft., 2.48 minutes

Total volume of contactor basin: 20,702 Cu. Ft

Hydraulic Retention time: 18.56 min @ 12 MGD

Baffle factor: 0.7

T₁₀: 12.97 minutes

Initial O₃ concentration: 0.7 ppm Final O₃ concentration prior to destruct: 0.0 ppm

Reference contactor basin diagram - **Appendix G**

Each contactor basin is provided with 3 sampling points for monitoring of residual ozone for CT determination. The sampling points are located at the end of diffusion chamber, end of contact chamber 3, and the end of contact chamber 6.

The capability to reclaim filter backwash water is provided at the pre-sedimentation basin in the ozone building. Three backwash water reclaim pumps are located on the bottom floor of the ozone building adjacent to the pre-sedimentation basin. 12-inch piping from the backwash storage retention basin at Treatment Plant 1 is piped to one of three horizontal centrifugal pumps. Each of the 10 hp pumps can pump reclaim water to the pre-sedimentation basin. The backwash water reclaim system is not used during WTP test runs or during emergency production. The backwash reclaim system may be used if the WTP is placed into routine production.

Process water to the ozone building is protected by a Watts 10-inch reduced pressure zone (RPZ) backflow preventer. Domestic water to the ozone building is provided by a 2-inch line just upstream of the RPZ.

Two 3.5ft X 3.5ft access hatches are provided at the top of each contactor basin above the diffusers. Each contactor basin also has one 30-inch diameter flanged hatch located at the bottom of the basin.

Much of the ozone facility's control system has been replaced and/or reprogrammed. Fin-Tek is the new contractor that provides assistance in ozone control issues. The work has resolved most of the start-up issues with the ozone facility.

WTP test runs show that ozone residuals cannot be maintained through the contact chamber; thus, limiting the CT potential. The ozone generators are also due for routine cleaning.

RAPID MIX

Number of Units: 2

Volume of each unit: 5.5ft X 5.5ft X 16 ft - 3,620 gallons

Detention Time at rated capacity: Approximately 17 seconds at 18 MGD

Mixer Type: 3.7 HP Lightnin mechanical mixer

Velocity Gradient (G): G-value of 380/sec.

Mixing rate: 4:1 variable speed control

Condition of equipment: Good - new in 2000

Chemicals added: Ferric chloride

Comment on Rapid Mix:

The rapid mix basins are designated as the east basin or west basin and each basin can be isolated with a gate valve. Ferric chloride is fed from the chemical feed room to a calibration chamber and the coagulant is applied directly into the rapid mix basin. Each mixer is maintained during and after each test-run or equipment shake-down. Each motor is lubricated with Low Tox turbine oil.

FLOCCULATION BASINS

Number of Units: 2

Volume of each unit: 44ft X 80.3ft X 16 ft - 422,853 gallons each

Detention time at rated capacity: 34 min

Type of Units: 3-stage flocculation unit

Inlet design: 36-inch piping

Is mechanical flocculator used? Yes, fifteen 1.5 HP Series 10 Lightnin impeller mixers w. variable speed are provided.

Condition of equipment: Good, new in 2000

Is C*T available? Not applicable, no disinfectant residual is carried through the flocculator.

Baffles: Each flocculator is separated into 3 stages with baffle walls in between each stage.

Preventive Maintenance: Monthly maintenance is performed on each of the 15 mixers in each flocculator.

Comments:

Each flocculation basin is divided into 3 stages with 11.3 minutes of detention time per stage at 18 MGD and a flow-through velocity of 1.3 fpm. The main influent is a 36-inch main influent line with five 30-inch outlets. Each stage has five vertical mixers set for a specific mixing speed. The mixers have an AFD 10:1 variable speed control with a G-value ranging from 30/sec to 80/sec. The outlet piping consists of five 36-inch outlets that manifold to a 54-inch pipe prior to entering primary sedimentation.

The flocculation basins and equipment were installed in 2000 and are in good condition. Problems have occurred in the flocculator control room with the digital read-outs failing to function due to the moisture in the air. WTP staff utilize portable hand-held units to monitor and control mixing within the flocculation basins. The original digital equipment has been removed since they no longer available from the manufacturer.

MDEQ Conclusions/Recommendations:

Although the original equipment cannot be replaced, moisture needs to be minimized in the control room in order to maintain other controls and electrical components in good working order.

Primary Clarifier Structure

Number of Units: Plate settlers - one unit containing three separate plate settler basins.

Type of units: Plate settlers

Volume of Each Unit: Three basins each at 39.5ft X 82 ft X 17.5 ft - 56,682 cu. ft. each

Plate Settlers: Each basin is equipped with 4 rows of plate settlers

Detention Time at rated capacity: 51 minutes at 12 MGD

Inlet Design: Two 48 X 48-inch inlet channels

Baffles: Not applicable - no disinfectant residual

Outlet Design: Four 24 X 24-inch outlet channels

Baffling Factor: Not applicable - no disinfectant residual

Overflow: 20-inch weir from the effluent channel and a 30-inch outlet that drains to a storm sewer.

Drains: Yes

Curbing: 6-inch curbing

Cleaning Procedure: Spyder sludge collection system consisting of zoned grid of parallel piping under suction

Sludge Disposal: 2 pumps rated at 350 gpm. Sludge is pumped to holding basin for discharge to the sanitary sewer.

Physical Condition: good

Effluent turbidity: 0.75 NTUs - based upon the 2009 emergency WTP operation & test-run reports through 2012.

Is C*T available? Not applicable, intermediate disinfection (chlorination) is provided at the plate settler effluent.

Comments:

Outlet piping from the flocculation basins manifolds into one 54-inch pipe. The 54-inch pipe splits into two 48 X 48-inch influents. The first influent pipe is for the existing primary clarifier and the second influent pipe remains for a future clarifier

The sludge collection system is designed for automatic operation, however, the float controls are not enabled since they do not function correctly. WTP staff activate the sludge collection system during each operator shift as part of routine operation.

Intermediate chlorination was added at the plate settler outlet - see Chemical feed section for more detailed discussion.

Softening with Lime Feed - Softening Not Practiced

Number of Units: 2 - East & West

Type of Units: Solids Contact Unit

Volume of Each Unit: 1.28 mgal

Rated Capacity: 17 mgd - West & 19 mgd - East

Upflow Rates: 1.47 gpm/sf - West & 1.64 gpm/sf -East

Detention Time at rated capacity: 118 min - West & 114 min - East

Inlet Design: 36-inch inlet pipe entering central circulation drum

Baffles: NA

Outlet Design: 20 effluent launders - 31.5 ft long

Baffling Factor: 0.5

Overflow: Piping to filters

Drains:

Two 6-inch drains, one at bottom of sludge hopper and the other at the bottom of the solids contact unit near

the sidewall

Curbing:

4-inch kickplates along the walkway and center platform. A 36-inch safety rail is also provided for the walkway, center column, and the outer perimeter of each contact unit. Kick plates are also provided around perimeter of the unit and access is provided to each launder.

Sludge Disposal:

Two sludge rotating scraper arms direct sludge to the center sludge hopper. Sludge from the hopper is directed to the sludge pumps.

Physical Condition: Both solids contact units are new and in good condition.

C*T: See **Appendix H**

Rapid Mix Area:

Mixing Unit: One marine propeller in central circulation drum with variable speed.

Chemicals added to rapid mix area: Lime and provisions for polymer and soda ash

Velocity Gradient (G) if available? Mixer provided with max. tip speed of 13.2 fpm (VFD controlled in a 6:1 range)

Flocculation Area: Upper zone of central reaction well

Short Circuiting: The unit is designed with baffling and short circuiting has not been noted.

Inlet design: Radial outlet ports from topside of central circulation drum

Is mechanical flocculator used? No

Condition of equipment: New in 2004

Baffles: Yes

Comments:

Each solids contact unit has two 4-inch lines to convey lime slurry to the central circulation drum. A 3/4" line conveys polymer to the mixing chamber. The chemical feed lines are fastened to the walkway and connected to the 36-inch inlet pipe. The lime application point is on the 36-inch inlet pipe approximately 15 feet before the central circulation drum. The polymer application point is in the 36-inch inlet pipe approximately 20 feet prior to the central circulation drum.

Cleaning Procedure: Each unit is drained to the bottom level through the side drain. The remaining water is pumped out from the unit and the sludge is hosed into the center sludge sump. 6-inch piping connects the sump to the sludge pumps by which the sludge is sent to the Bray Road lagoon. Water from the unit is drained to the sanitary sewer via the 6-inch drain. The southeast lime bin silo experienced problems associated with moisture build-up.

Preventive maintenance: The pump motors and scraper arm gears are greased periodically. The scrapers, skirting, and the condition of other mechanical equipment are also checked.

Effluent turbidity, average/range: 0.6 - 0.7 NTUs. Although softening is not practiced an additional 0.05 - 0.1 NTUs of turbidity settles out in softening clarifier basins.

MDEQ Conclusions/Recommendations:

Both clarifiers were constructed in accordance with 10-state standards and WTP staff attempted to operate the contact units during the 2006 and 2007 test-runs; however, further lime softening has not been practiced. The inability to soften is due to the time needed for sludge blanket formation and stabilization verses the time allotted for routine WTP test-runs (one week). Also, most pipeline emergencies require the WTP to be capable of distributing potable water within 24-36 hours of plant start-up. We concur with WTP operators that it is not practical to attempt softening given WTP's current operating role. The need to soften in the future, once again, will depend on the city's long-term source of drinking water.

Re-Carbonation:

Type: Pressurized solution feed system

Number of Units: Two contactor basins - 50ft X 10.6ft X 14ft - 55,800 gal each with baffling

Detention Time: 4.5 minutes at 18 mgd

Storage: Liquid CO2 storage - one 34-ton storage tank - Tomco model WT34CA
 CO2 Feeder: Two feeders each rated at 325 lbs/hr
 Solution Diffuser: Two multiport diffusers to input CO2 into the feed water stream

Since lime softening is not practiced, the recarbonation system is not used.

FILTRATION

Type of filter: Declining rate

Number and Area of Filters: 12 @ 700 sqft each

Design Filtration Rate: 3.0 gpm/sqft - 3 mgd per filter - 36 mgd total filter capacity

Approved Filtration Rate: 3.0 gpm/sqft

Maximum Rate Experienced: 18.2 MGD rate for 1 hour during Sept. 2009 emerg. Op.

Maximum filtration rate: 4.0 gpm/sqft - filter #8 and #9 for 1 hour during Sept 2009 emerg. Op.

Is flow equalized through all filters? Yes

Rate of flow device:

Flow control valves are provided on the filter effluent piping of each filter - % open - close.

The flow control valves consist of butterfly valves controlled by an electric operator.

Filter to waste:

Filters 1 -4: Filters 1 & 3 share a common drain. Filters 2 & 4 share a common drain.

This common drain limits the filter to waste capacity for Filters 1 through 4.

Filters 5-12: The filter to waste lines from each individual filter discharges to a common drain and this piping configuration does not pose a hydraulic limitation.

Filter hours:	Average:	Maximum :	Minimum:

Filter hours are not available since the WTP test run (one week) concludes prior to filters needing backwash. Filter run hours will become available only if the WTP assumes fulltime operation or test runs of longer duration are performed.

Filter Media - Filters No. #1 - 12 Mixed Media filters

	<u>Anthracite</u>	<u>Sand</u>
Depth - inches	18	12
Effective size (mm):	1 - 1.2	0.45 - 0.55
Uniformity coefficient	<1.5	<1.6

Date Last Rebuilt or Checked: The filters were installed in 2005 and 2006. Each filter was backwashed 3 or 4 times following installation and the depth of the sand and anthracite was measured.

Underdrain Type: General Filter Multi Concrete II -ABS plastic underdrain forms w. plastic media retaining nozzles
 Curbing: 4-inch

Filter Overflow: None

Surface Wash: None

Depth of Water Above Media: 7.92 feet

Filter Performance Records: - yes, records have been established

Turbidimeters

Is there continuous turbidimeter for each filter? Yes

Is there continuous turbidimeter for the applied? No, grab samples

Is there continuous turbidimeter for confluence? Yes, not is use

Turbidimeter used for combined compliance: NA

Calibration frequency: See comment

Calibration frequency: See comment

Calibration frequency: See comment

Calibration frequency: See comment

Comments:

Continuous turbidimeters are provided for each filter and for filter confluence. Plumbing changes were completed in order to allow the individual filter turbidimeters to function properly in the filter to waste mode. The continuous turbidimeters have been in operation and filter turbidities are monitored during WTP test runs. The filter confluence turbidimeter also monitored turbidity during the 2009 emergency plant runs. During routine WTP test runs none of the filtered water reaches this turbidimeter since the filters are in filter to waste mode.

WTP plant tap maximum turbidity during the Sept 2009 emergency operation was 0.16 NTUs based on lab grab samples collected every 3 hours. The maximum individual filter turbidity was 0.19 NTUs from Filter #9 based on 3 hour grab samples. The maximum individual filter turbidity based on the on-line continuous turbidimeters was less than the turbidity reported from the grab samples from all operating filters during the September 2009 emergency operation.

Backwash: Combined air-water backwash system

Average run length time of filter: NA - WTP test runs are not long enough to determine filter run times.
Criteria for backwash: End of plant test-run, head-loss for longer runs and turbidity limit.

Source of backwash water:

Flint distribution system - two feeds labeled as east and west wash water supply
The east wash water supply is fed from a 42-inch line with a flow range between 3,500 gpm and 12,000 gpm.
The west wash water supply is fed from a 24-inch line (hydraulic limitations - 8-inch bottleneck in valve vault)
The wash water supply lines are equipped with a 16-inch PRV suitable for reducing the pressure from 80 psi to 10 psi at the stated flow range. The PRV consists of a pilot controlled globe valve.

Average duration of backwash: 15 minutes
Maximum duration of backwash: 15 minutes
Average backwash flow, gpm: 6300 gpm
Maximum backwash flow, gpm: 9800 gpm
Maximum backwash rate - variable rate 5 - 20 gpm/sqft
Airwash rate: 3 scfm/sqft - 2 blowers each with 1000 cfm at 5.5 psig capacity

The filters are backwashed in the following stages:

Stage 1 - Ramp-up backwash water flow rate from 0 to 2000 gpm - no air, 1.5 minutes duration
Stage 2 - Ramp-up backwash water flow rate from 2000 to 6300 gpm - with air - 1.0 minute duration
Stage 3 - Maintain backwash water flow rate at 6300 gpm - with air - 8.0 minutes duration
Stage 4 - Ramp-up backwash water flow rate from 6300 gpm to 9800 gpm - no air - 2.0 minutes duration
Stage 5 - Maintain backwash water flow rate at 9800 gpm - no air - 2.5 minutes duration
Stage 6 - Ramp down backwash water flow rate from 9800 gpm to 0 gpm

Backwash water disposal:

An existing backwash equalization basin between WTP No. 1 and the ozone building stores backwash water. The retained backwash water can either be directed to the head of the ozone treatment or discharged to the sanitary sewer.

Is bed expansion achieved? Yes, bed expansion was tested during equipment shakedown
Is there loss of media during backwash? A small amount of media was lost (mostly fines) after initial installation
WTP staff are planning to core the filter media within the next one or two years as part of filter maintenance.

Filter to Waste & Backwash disposal - Unique to Flint WTP

During WTP test runs, production water is filtered to waste and discharged to the Flint River in accordance NPDES General Permit MIG640000 - Certificate of Coverage MIG640053. The COC was renewed on

April 1, 2010 and expires on April 1, 2015.

Filter to waste water exits the south side of the WTP facility through a 36-inch line that is connected to an intercept box. The box is divided into two sections by a slide gate valve. During the filter to waste mode, the slide gate valve is open and filter to waste water flows through the intercept box and to a discharge pipe for discharge to the Flint River. After completion of a routine test run, the WTP is shut down and the filters are backwashed. Filtered backwash water is directed from the intercept box to the wastewater transfer pump station. The backwash water is pumped from this station to a backwash retention basin through a 14-inch line. Backwash water is stored in this basin and can either be discharged to the sanitary sewer or recycled to the front of the ozone treatment process. The intercept box design does not allow filter to waste and filter backwashing to be performed simultaneously.

Wastewater flow schematic:

Reference Appendix G

Location of recycled stream into plant flow: Pre-sedimentation basin at the ozonation facility.

Is treatment/equalization provided prior to recycling? Yes

If yes:

Type of treatment: Equalization (storage) of backwash water

Volume of treatment/equalization unit: 820,000 gallons (approx. 4 backwash volumes)

Frequency of recycle stream from unit: Backwash water is not recycled at this time, instead the backwash is discharged to the sanitary sewer through a 10-inch drain and pump.

Chemical used, if any: None

Frequency of solids removal:

Associated problems with filters:

(Yes/No)

Air Binding - No

Cementing - No

Gravel Mounding - No

Media Loss - No

Adequate Backwash Rate - No

Media Growth - No

Media Attrition - No

Bacteria Growth - No

Uniform Backwash - No

Mudballs - No

Comments:

The filters were installed in 2005 and 2006 as part of the WTP rehabilitation project. The filter electrical controls have required repairs due to a lack of routine operation. Piping to allow for filter monitoring including turbidity, flow rate, and headloss were re-plumbed to allow monitoring of these processes during the filter to waste mode. The monitoring equipment was also re-calibrated. Combined filter effluent turbidity and total flow rate cannot be monitored unless the WTP is sending filter effluent to the 3 mgal clearwell under emergency operation.

Each filter is disinfected in accordance with the AWWA standard for filter disinfection prior to each WTP test-run. Each filter is also backwashed three or four times following completion of each WTP test-run.

MDEQ Conclusions/Recommendations:

WTP operators have gained considerable experience in operation and maintenance of the WTP filters through continued WTP test runs and emergency operation. The WTP filters demonstrated their ability to distribute water meeting the turbidity standard during the 2009 emergency operation. Additional experience including determination of filter run times; however, are not possible given the short duration of routine test runs. Longer WTP test runs (10 days or more) would need to be performed to determine filter run times and to become familiar in conducting routine filter backwashes while the WTP is producing water. Since Flint is not allowed to co-mingle treated water from the Flint River with water purchased from DWSD, it is also not possible to perform a filter backwash while the WTP is producing water given the constraints with the filter to waste/backwash discharge system. WTP operator would need to temporarily stop producing water in order to perform a filter backwash.

The WTP has two sources of backwash water (east wash water supply and west wash water supply). The west wash water supply is provided from a 24-inch main immediately west of the WTP. The ability of the west wash

water supply is limited by an existing 8-inch bottleneck within an existing valve vault. This bottleneck needs to be eliminated in order to increase the capacity of the west wash water supply the west filters.

WTP staff are planning to core the filter media within the next year or two as part of establishing a routine filter maintenance program. We encourage WTP operators to establish an on-going filter maintenance program that includes filter coring. Other important filter maintenance activities include; rodding, raking, and excavation. These types of activities will help in detecting typical filtration problems, listed above, that have been encountered at other WTPs.

PLANT TREATED WATER STORAGE/CLEARWELL

(3 MGAL Well)

Location: Immediately south of Pump Station No. 4

Size: 3.0 mgal

Percent above grade: Totally buried, however top portion is mounded less than 20% above grade

Low water level: 11 ft with alarm, 14 ft for high alarm, 15 ft to top - 3 ft operating range

Isolation capabilities: The reservoir can be isolated with slide gate valves.

Vents: not present

Reservoir Baffling: middle baffle wall

Drains: Yes via high service pumping, then portable pump is used to remove remaining water.

Overflow: yes - at 15.5 ft

Access Hatches: three 36-inch circular hatches

Alarms: none, each access hatch is locked

Last Inspection: 1997

C*T credit: See **Appendix H**.

Comments on treated water storage/clearwell:

The reservoir can be isolated with existing slide gate valves. Water can be pumped from the Dort reservoir with the 3 MGAL well out of service. The reservoir is equipped with an internal overflow weir and drain at an elevation of 720 feet. The reservoir also has three manhole vents.

MDEQ Conclusions/Recommendations:

The 3 MGAL Well is due for a routine inspection. The integrity of the concrete base around each of the manhole vents needs to be verified. Any repairs that are needed should be completed at the time of the inspection or shortly after.

CHEMICAL FEED

CHLORINE

Chemical supplied: Gas chlorination, Tablet feeder

UL/NSF approved? Yes

Standard 60 max dose:

Supplier: Alexander Chemical Co.

Chlorine Feed Points:

- 1) Gas feed system for post CL2 - small junction box prior to 3 MGAL clearwell
- 2) Tablet feed system for intermediate CL2 - Plate settler effluent

GAS FEED SYSTEM:

Chlorine Evaporators:

Two Series 50-200 liquid chlorine evaporators. The chlorine evaporators are needed if the chlorine feed rate exceeds 400 lbs/day.

Chlorinators

Type of Feeders: Five Wallace & Tierman V-notch feeders

Location of vacuum regulators: In the first chlorine storage room

- 1) WT maximum feed rate: 2000 lbs/day
- 2) WT maximum feed rate: 2000 lbs/day
- 3) WT maximum feed rate: 2000 lbs/day
- 4) WT maximum feed rate: 500 lbs/day
- 5) WT maximum feed rate: 500 lbs/day

Chlorine Feed Dosage Determination:

Post Chlorination is not practiced except during emergency operation since the feedpoint is located at the 3 mgal well which also transmits purchased water from Detroit. Based on frequent laboratory bench tests and emergency operation in 2009, WTP operators have determined the chlorine demand through the treatment process to assure sufficient plant tap residuals during emergency operation.

Intermediate CL2: Liquid chlorine applied ranges between 3.0 - 4.0 ppm.

3 Mgal Well: Gas CL2 application approximately 1.0 ppm.

Chlorine Room Description:

The chlorine room is located in the NE section of P.S. #4 and consists of two separate rooms. The first room contains the chlorine cylinders, liquid chlorine evaporators, and vacuum regulators. The second room contains the chlorine feeders.

Scales: 2 weigh scales 0 - 8000 lbs are provided. Each scale can weigh two cylinders at a time.

Minimum days of storage:

One 1-ton cylinder is set-up and available for use; however, no more than 1500 pounds of gas chlorine is stored in order to meet process safety management requirements. Additional gas chlorine is available from the waste water treatment plant on short notice.

Gas Chlorine Safety Features/Summary: (Y/N)

NSF Approved - Yes

Air Pack - Yes

Respirators - No

Chlorine Leak Alarm - Yes - 0.03 ppm

Leak Detection Bottle - Yes

Cylinder Restraint - cylinders are cradled

Doors Open Outward - Yes

Heater - Yes

Window - Yes - one for each room

Scales - Yes

Panic Hardware - One first door, none on door to CL2 feed room

1st Responders - Yes

Haz-Mat Team - Yes - Genesee County

Inside Access - Yes - via P.S. #4

Outside Access - Yes

Repair Kit - Yes

Ventilation - Yes

Air Supply - Yes

Fan Switches -Yes, located on wall outside the chlorine sto. rm.

Comments:

Make-up water for the chlorine feed system comes from plant service water. All five chlorinators plant service water is

supplied from the city distribution system and has full protection.

All five chlorinators share a single gas vacuum manifold to the raw water and finished water feed points. The cross connection between the low service pump discharge and the 3 MGAL reservoir through the gas vacuum piping has been physically separated. Make-up water to each ejector is plant service water also has full protection.

WTP staff operated the gas chlorine feed equipment during both emergency plant runs in 2009. Intermediate chlorination was installed in 2010 and placed into service in the November 2010 routine test run. Intermediate chlorination reduces the amount of chlorination needed at the 3 Mgal well (post chlorination).

Intermediate Chlorination: (Tablet Feed System)

Two skid-mounted Constant Chlor Chlorinator units (Model MG-22) at the plate settler effluent utilizing calcium hypochlorite tablets. Each unit's feed capacity is 384 LBs of calcium hypochlorite per day or 250 Lb/day avail CL2. Chlorine tablets are loaded into briquette hopper and the tablets are dissolved by a spray system using plant service water. The dissolved calcium hypochlorite creates a 1.7% liquid CL2 solution. The chlorine solution is pumped into the treatment flow stream with an LMI Series G (115 GPH) pump at an application rate ranging between 3.0 - 4.0 ppm. The chlorine solution is discharged into an open channel flow leaving the plate settler clarifiers.

Ferric Chloride:

Chemical supplied: 39% ferric chloride

UL/NSF approved? Yes

Standard 60 max dose:

Chemical feed point: Rapid mix

Supplier: PVS Knollwood

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	0.5 HP GE HC pump	2500 ml/min	18 ml/min
2	0.5 HP GE HC pump	2500 ml/min	18 ml/min
3	0.5 HP GE HC pump	2500 ml/min	18 ml/min

Chemical feed dosage determination: Jar-testing

Ferric Dosage Calculation: Ferric is pumped and timed through a graduated cylinder - ml/min

Feeder calibration frequency:

Scales? Side-read strip and sight glass on the bulk storage tanks, ultrasonic level device are also provided on all six tanks.

Chemical Storage: Three bulk storage tanks and three day tanks are provided.

Bulk storage: Three 6,500 gallon tanks are located in the treatment plant's train shed at the west end of the facility and ferric chloride is piped by gravity to three 2,000 gallon day tanks in the WTP basement. Each of the three tanks have a common 4-inch overflow and 8-inch vent. A sightglass is provided on the side of each tank for level determination. Each tank also has a level sensing system.

Minimum Days of Storage: 27 days

FEED RATE: Approx 800 lbs/day during WTP test-runs. (based on the emergency operations in 2009)

FeCL3 Dosage: Approx 45.0 mg/l - with range of 31.9 mg/l to 82.6 mg/l depending on raw water turbidity

Ferric Dosage: Approx 15.0 mg/l - with range of 11.0 mg/l to 28.4 mg/l

Transfer pumps: None - 2-inch gravity piping from the bulk storage tanks to the day tanks with electrically actuated valves allows for transfer of ferric chloride to the day tanks.

Day tank: Three 2000 gallon tanks located in basement NE and below west softening basin
Each day tank is equipped with a level sensing system

Spill protection: The bulk storage tanks are dual walled design. The day tanks are contained within a
a four foot containment wall.

Piping identification: The ferric piping is color coded accordingly.

Overfeed protection: None

Ferric Comments:

Three ferric feed pumps are provided and the pumps are located within the containment area with the day tanks. Each pump is piped to take suction from its own day tank, however, all three pumps and day tanks are piped and valved such that each pump has the capability to draw off any one of the three day tanks. The feed rate from each pump is adjusted by turning a calibrated screw from between a 0 and 100% setting. Each pump discharges ferric chloride to either the east or west rapid mix basin.

A control system for filling the bulk storage tank and transfer to the day tanks is in place. The system consists of level sensors and electrical control valves that controls filling of the bulk storage tank and transfer rates to the day tanks.

LIME FEED SYSTEM: Not in use

Type: Lime slaking system

Number of Units: Four

Capacity: 2000 lb/hr each

Storage: Four separate lime storage bins (NE, SE, NC, SC) are provided with 120 ton capacity in each bin.
Plant operators estimate a one week test run uses approximately 80 tons of lime.

Type of Lime: Quicklime - 90% pebble lime

Feed Point: Inlet pipe of solids contact unit

Feeder: Four Wallace & Tierman screw type volumetric feeder - capacity of 32 cuft/hr each.

Quicklime is fed continuously at one end of the slaking compartment. At the other end of the slaker, the paste is discharged over a weir into a dilution chamber where a manually controlled continuous water spray converts the paste to a slurry of known concentration. Plant process water is used for make-up water to the slakers.

The lime feed system has not been used in WTP test runs since 2009 due to the time needed to establish a sludge blanket. Moisture problems have also been encountered in the lime storage silos which resulted in operational problems in earlier WTP test runs.

FLUORIDE Not in use

Chemical supplied: System designed for hydrofluosilicic acid, however, the system is not in use nor is any acid stored.

UL/NSF - No chemical or supplier at this time.

Standard 60 max dose: To be determined upon chemical used.

Chemical feed point: Influent to softening clarifier

Supplier: None

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>
1	LMI C721-71 FS	96 gal/day @ 100 psi
2	LMI C721-71 FS	96 gal/day @ 100 psi
3	LMI C721-71 FS	96 gal/day @ 100 psi

Chemical feed dosage determination: Not determined at this time.

Fluoride dosage calculation: A 1000 ml calibration chamber prior to each metering pump is provided.

Feeder calibration frequency: NA

Scales?

Chemical Storage: Two 55-gallon constant head tanks on 2nd floor of chemical feed room.

Bulk storage: Five intermediate bulk storage tanks are provided, however, these tanks are not connected to the fluoride feed system. These tanks remain unopened on pallets in the WTP basement adjacent to the ferric feed area.

Minimum Days of Storage: See comment

Transfer pumps: See comment

Day tank: See comment

Spill protection: See comment

Piping identification:

Overfeed protection: The fluoride feed pumps are electrically interlocked with the low service pumps and the west-in channel flow meter

Comments:

The bulk storage portion of the fluoride feed system is not set-up at this time. When the installation is complete, hydrofluorosilicic acid will be drawn from bulk storage to each one of three 1000 ml calibration chambers then through one of the three metering pumps. The acid will be pumped to one of the 2 constant head tanks where water is added to the acid. The acid solution will then be fed from the constant head tank at an established rate to the influent of each softening unit.

Installation of the fluoride feed system has not been completed and the fluoride feed system has not been operated during routine WTP test-runs. Fluoridation is not practiced as part of routine WTP test runs or emergency operation. Fluoridation will be instituted only if the WTP were to assume full time operation.

Flocculation Aid Polymer:

Not in use

The feed system is installed however, it is not in use. Due to better than expected turbidity removal in the plate settlers this feed system is not expected to be used.

Chemical supplied: None

UL/NSF approved? NA

Standard 60 max dose: NA

Chemical feed point:

Supplier:

Chemical feeders:

<u>model</u>	<u>max feed rate</u>

1	LMI C781-34	25 gal/hr @ 30 psi
2	LMI C781-34	25 gal/hr @ 30 psi
3	LMI C781-34	25 gal/hr @ 30 psi

Chemical feed dosage determination: NA

Polymer dosage calculation: NA

Feeder calibration frequency: NA

Scales? None

Chemical Storage: No chemicals are being stored

Bulk storage: None

Minimum Days of Storage: NA

Transfer pumps: NA

Day tank: NA

Spill protection: NA

Piping identification: NA

Overfeed protection: NA

Polymer Comments:

The flocculation aid feed system is not expected to be used due to the performance of the inclined plate settlers. WTP staff may use the LMI feed pumps from the flocculation aid feed system for the softening aid feed system.

Softening Aid Polymer:

Not in use

Chemical supplied: Claraflocc C-1600 Polyalluminum Chloride

UL/NSF approved - Yes

Standard 60 max dose:

Chemical feed point: Softening basin influent prior to the lime application point.

Supplier: Poly-Dyne

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	Poly-blend & LMI	2 gal/hr	
2	Poly-blend & LMI	2 gal/hr	
3	Poly-blend & LMI	2 gal/hr	

Chemical feed dosage determination: Jar testing

Polymer dosage calculation: see comments below

Feeder calibration frequency: Checked on every WTP test-run, will increase frequency to monthly

Scales? Each day tank has a graduated scale

Chemical Storage: 55-gallon drum stored in room adjacent to the chemical feed room

Bulk storage: None

Minimum Days of Storage: Not determined

Spill protection: None

Piping identification: Yes

Overfeed protection: No

Polymer Comments:

The softening aid system is in use and is used more as a filtering aid.

Optimal polymer dosage is determined by adding different quantities of polymer to a liter of plate settler effluent. The optimal dosage of polymer is then determined in ml of polymer/ L (plate settler effluent). The feed system is configured to apply a specific amount of polymer in gph. For the calculation, the daily flow is changed from mgd to L/min. The determined dosage is then converted from ml/L to mL/min. The dosage determination is then converted from ml/min to gal/hr.

Flow gal/day X 1day/24hrs X 1hr/60min X 3.785L/gal

ml/min X 1L/1000ml X 1gal/3.785 L X 60 min/hr

Coagulation Aid Polymer:

Not in use

Chemical supplied: Not in use

UL/NSF approved?

Standard 60 max dose:

Chemical feed point: Rapid mix

Supplier:

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	Poly-blend - LMI	2 gal/hr	
2	Poly-blend - LMI	2 gal/hr	
3	Poly-blend - LMI	2 gal/hr	

Chemical feed dosage determination: NA

Polymer dosage calculation:

Feeder calibration frequency: NA

Scales? None

Chemical Storage: No polymer stored

Bulk storage: None

Minimum Days of Storage: NA

Transfer pumps: None

Day tank: Removed

Spill protection: None

Piping identification: Yes

Overfeed protection: None

Polymer Comments:

The coagulation aid feed system is also not in use. WTP staff do not intend to use the feed system at this time due to adequate coagulation without the polymer.

The coagulation aid feed system has been changed since its initial installation in Segment 3 of the rehabilitation project. The previous feed system was not able to pump the polymer due to its high viscosity. If coagulation aid is used in the future, the chemical will be supplied in a powder form and a solution will be prepared in an existing mechanical mixer located on the second floor above the chemical feed room. The coagulation aid solution will be prepared in a batch process by adding a set amount of powder to a set volume of water in the mixer and transferred from the mixer to the day tanks through 1 1/2-inch piping and a transfer pump. The polymer will then fed by gravity from the day tanks on the second floor to the metering pumps on the first floor for application into the rapid mix.

PLANT PIPING AND MISCELLANEOUS

	<u>pipe diameter</u>	<u>length</u>
Intake pipe:	72-inch	50 Ft
Low service discharge:	48-inch	Approx 450 Ft to O3 Bldg.
Filter influent:	24-inch	In WTP
Filtered water effluent:	24-inch	In WTP
High service suction header:	36-inch	In P.S. 4
High service discharge:	36-inch	In P.S. 4
Backwash:	24-in (West)	In WTP
	42-in (East)	In WTP
Surface wash:	None	None
Wash water drain:	16-inch	In WTP
Intake backflush line:	None	None
Sludge drain:	8 to 12-inch	To Bray Rd Lagoon *
Plant service line:	(2 total) 24-inch from city	West side of WTP
	42-inch from city	East side of WTP
Do any roof drains or other drains enter treatment process?		No

Pipe Color Coding: In accordance to AWWA standards: To be provided

Plant Cross Connections and Common Walls:

Filter gullets? Yes

Common walls? Yes

Chlorine feed room? Chlorine is applied to filtered water - piping for raw water chlorination remains in place, however, raw water chlorination is not practiced.

Plant water RPZ? All plant service water comes off 6-inch line with a 6-inch RPZ

Chemical feed areas? Plant service water is utilized and full protection is provided.

Surface wash? No surface wash

Boiler? A Wilkins 1032213 RPZ is provided on the make-up waterline to the boiler and the device was recently tested.

Dishwasher? NA

Dehumidifier? Not connected to WTP water supply

Comment on Plant Piping Miscellaneous:

WTP process water is obtained from Flint's distribution system and is protected by a 6-inch RPZ backflow preventer. WTP domestic water is provided by a 2-inch line that tees off the 6-inch process water line just upstream of the RPZ backflow preventer. Plant domestic water serves the bathrooms, lunchroom, and laboratory.

A common wall exists between the filter gullet and filtered water as part of the original construction of the treatment plant. This concern was discussed during the rehabilitation project and any wall cracks that were discovered during the filter rehabilitation were repaired with a sealant. Also, two coats of sealant were applied on the wall separating the filter gullet and the filter box.

* The condition of the sludge drain line from the WTP to the Bray Road sludge lagoon needs to be verified and part of routine operation and maintenance.

Reference **Appendix J** for a filter schematic.

PLANT METERING AND CONTROLS

Plant Domestic Metering: None

Raw Water Metering: Ultrasonic flowmeter after risewell in piping below lime feed room

Ozone System: Meter monitors flow to each ozone chamber

High Service Metering: Venturi meter - information sent to the WTP's SCADA system

Plant Controls:

Chemical Feed

Gas chlorine - manually controlled at Pump Station No. 4. Continuous chlorine monitoring is performed at P.S. #4. The equipment is located at the high service pump discharge.

Tablet CL2 - manually controlled at plate settler effluent

Ferric - at WTP

Fluoride - not provided at this time

Chemical transfer pumps: manual with auto-shutoff

Filters - manual control with status monitoring from SCADA

Filter Backwash - BW is initiated manually, the BW stages can be manual or automatic

Low Service Pumps - Manual operation at P.S. 4

High Service Pumps - manual control from operations center. Low level alarm provided are provided for both reservoirs and the status is reported to the SCADA system.

Elevated Tank - tied to Control Station 2

Plant Alarms:

Basement Flooding - Yes

Chlorine Leak - Yes

Chlorine Supply - Yes

Low Service Intake Well -

Pretreatment Basin Levels - Yes, in Ozone

Pretreatment Sump Pump Failure - Sump alarms

Filter Level - No, has capability through SCADA

Individual filter turbidity - Yes, not in op. yet

FeCl storage tank filling- Yes

CFE turbidity - Yes

Backwash Holding Tank-Weir tank in front of WTP - Yes

High Service Pump Discharge Pressure - Yes

Finished Water Reservoir - Yes

Elevated Storage tanks - Yes

Elevated tank loss of signal - Yes

Main Control System Failure- Back-up power supply

L/H pressure at Baxter & Potter - 72-inch pipeline

Comment on Plant Metering and Controls:

Low level alarm at 3 MG well - 11 ft

Low level alarm at Dort reservoir - 5 ft

Valve Operation:

Are critical valves exercised on a routine basis? See status listed below

Valve LocationExercised

Intake Valves - No

High Service Isolation valves - No

Clearwell Valves - Yes

Influent/Effluent Pretreatment Basins Valving - used in plant test-runs and equipment shakedown

Effluent Flume Valve - No

Low Service Pump Discharge Valving - Yes

WTP treated water effl. valve to 3 Mgal well - Yes

MDEQ Conclusions/Recommendations

The WTP is equipped with numerous valves that are essential for reliable operation. These valves provide the ability to isolate critical components of the WTP. WTP staff need to maintain and expand their program of operating critical WTP valves. Also, an important component of this program is to have an accurate WTP yard piping diagram. The yard piping diagram should denote the location of buried piping on WTP plant grounds and their points of connection to the WTP, reservoirs, control stations, and the elevated tank.

Interruptions in Operation:

Electrical service to the WTP was upgraded during the rehabilitation project. The main circuit to the WTP located northeast of the WTP #1 has been upgraded with primary protection. New circuit breakers were installed and primary protection was provided.

Laboratory Certification:Comments on laboratory:

Continuous individual filter turbidity trends are compiled during WTP operation.

The laboratory staff have a written procedure in place for ferric jar testing and has compiled operating nomographs for varying operating condition. Procedures for lime and ploymer feed have not been developed since they are not being used at this time.

WTP operators have acquired sufficient chlorine demand data with the installation the intermediate chlorination and the dechlorination systems.

TABLE 2: LABORATORY: Purchased Water Operation

Parameter	*Method	Calibration	Sample Points	Sample Frequency
Alkalinity	2320 B. Titration Method	No calibration Standardization of titration chem monthly	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
Chlorine	4500-Cl G. DPD Colorimetric method 4500-Cl I. Iodometric Electrode Technique	No calibration check results with standard 3 point calibration prior to use of electrode	Laboratory Tap Baxter & Potter Rd Plant Storage Facilities Distribution system	2/day 1/day 2/day 2/week
Fluoride	4500-F C Ion Selective Electrode	2 Point daily calibration	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 1/week
Hardness	2340 C. EDTA Titrimetric Method	No calibration Standardization of titration chemicals.	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
pH	4500- H+B. Electrometric Method	2 Point daily calibration	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
Temp.	2550 B. Laboratory & Fields Methods	Acc. check of therm. against NIST certified thermometer	Laboratory Tap River Intake	1/day 3/week
HPC	Index Simplate Method	No cal, sterility check of media & sample vessels. Use of pos. & neg. controls with each test group performed.	Laboratory Tap Distribution system	1/mo 1/mo
Turbidity	2130 B. Nephelometric Method	Daily calibration check with secondary stds, monthly calibration with primary standards	Laboratory Tap Baxter & Potter Rd	3/day 1/day
Coliform	Colilert Presence-Absence Method	No calibration, sterility check of media & sample vessels. Use of pos & neg controls w. each set of sample vessels & media rec.	Laboratory Tap Baxter & Potter Rd Plant storage facilities Distribution system	2/day 1/day 2/day 2/week

TABLE 3: LABORATORY: Test Run Operation

Parameter	Method*	Calibration	Sample Points	Sample Frequency
Alkalinity	2320 B. Titration Method	No calibration, standardization of titration chemicals monthly	River Intake	1/day
			Plate Settler Effluent	Every 2 hours
			Solids Contact Center Mix Well	Every 2 hours
			Filter Effluent	1/day
Total Residual Chlorine	4500 - Cl Iodometric Electrode Technique	3 Point calibration, prior to testing.	River Outfall	Once, Daily
Ozone	4500 - O ₃ Indigo Colorimetric Method	Yearly calibration of Spectrophotometer	Beginning of Contact Chamber #1	Every 4 hours
			Middle of Contact Chamber #2	Every 4 hours
			End of Contact Chamber #3	Every 4 hours
Hardness	2340 C. EDTA Titrimetric Method	No calibration, standardization of titration chemicals.	River Intake	1/day
			Plate Settler Effluent Solids Contact Effluent Filter Effluent	1/day
pH	4500 - H ⁺ B. Electrometric Method	2 Point, daily calibration	River Intake	1/day
			Plate Settler Effluent	
			Solids Contact Center Mix Well	
			Solids Contact Effluent	1/day
Temp.	2550 B. Laboratory & Field Methods	Accuracy check of thermometer regularly against NIST certified thermometer.	River Intake	Every 4 hours
Turbidity	2130 B. Nephelometric Method	Daily calibration check with 2ndary stds, monthly calibration with primary stds.	River Intake	Every 4 hours
			Plate Settler Effluent	Every 4 hours
			Solids Contact Effluent	Every 4 hours
			Filter Effluent	Every 4 hours
Total Susp. Solids	2540 D. Total Suspended Solids Dried at 103-105° C	Daily calibration of analytical balance, and standards tested	River Outfall	Once, Daily
Coliform	Colilert Presence-Absence Method	No calibration, sterility check of media & sample vessels. Use of positive & negative controls with each set of sample vessels.	River Intake - MPN	1/day
	Colilert Quanti-Tray MPN		Plate Settler Effluent	Every 8 hours
			Filter Effluent	Each filter in service, 1/4 hrs

* all methods except for coliform testing come from Standard Methods for the Examination of Water and Wastewater.

Sanitary Survey of Community Water Supply - Review Summary

Water Supply: _____

County: _____

Evaluator: _____

WSSN: _____

District: _____

Date: _____

Category	Comment	N/A	NotEv	NoD/R	Rec	Def	SigDef
Source							
Construction & Maintenance							
Standby Power							
Isolation							
Source Water Protection							
Capacity							
Treatment							
Disinfection							
Fluoride							
Phosphate Addition							
Softening							
Iron/Manganese Removal							
Arsenic Removal							
Pretreatment							
Filtration (gravity or membranes)							
C*T							
Other							
Distribution System							
Interconnections w/ Other WS							
Hydrants & Valves							
Service Lines & Metering							
General Plan							
Cross Connections							
Construction & Maintenance							
Capacity							
Finished Water Storage							
Construction & Maintenance							
Controls							
Capacity							
Pumps (All Pumping Facilities)							
Construction & Maintenance							
Controls							
Capacity							
Monitoring & Reporting							
Bacteriological Monitoring							
Chemical Monitoring							
MOR or Annual Pumpage Report							
Consumer Confidence Report							
Analytical Capabilities							
System Management & Operations							
Owner Responsibility							
Capacity Development							
Reliability Study							
Operations Oversight							
Permits							
Operator Compliance							
Operator Certification							
Technical Knowledge & Training							
Security							
Emergency Response Plan							
Site Security (Fences, Alarms...)							
Financial							
Rates							
Budget & Capital Imp. Plan							
Other							

N/A - Not Applicable

Rec - Recommendations Made

NotEv - Not E NoD/R - No Deficiencies/Recommendations Made

Def - Deficien SigDef - Significant Deficiencies Identified

Appendices

Appendix A

Plant Flow Diagram

Appendix B

2004 Monitoring Schedule

Appendix C

C*T Calculations

Appendix D

Treatment Optimization Recommendations

April 9, 2013

Mr. Daugherty Johnson, Utilities Administrator
 City of Flint
 1101 South Saginaw Street
 Flint, Michigan 48502

WSSN: 02310

Dear Mr. Johnson,

SUBJECT: City of Flint, Water Treatment Plant Sanitary Survey

This letter confirms my visits with Mr. Brent Wright, Water Treatment Plant Superintendent on December 13, 2012 and January 16, 2013 and summarizes the subsequent review and discussion of the water supply facilities serving the city of Flint. The purpose of this meeting was to evaluate the water system with respect to the requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). In addition, the enclosed Water System Sanitary Survey was updated to gather information on the Flint Water Treatment Plant (WTP).

Our updated survey visit confirms that intermediate chlorination was installed at the primary clarifier outlet in 2010 and is being used in WTP test runs. Also, a more permanent de-chlorination feed system was installed in the Pump Station #4 building to de-chlorinate filter to waste water prior to discharge to the Flint River during routine test runs. These provisions increase the confidence in the WTP's ability to produce water that meets the drinking water standards. Subsequent WTP test run report continue to show that the treatment plant can operate as an effective stand-by treatment facility.

The following table summarizes our findings from our survey of the water system:

Survey Element	Findings
Source (Including P.S. 4)	Deficiencies Identified
Treatment	Recommendations made
Distribution System	Not evaluated – see dist. survey
Finished Water Storage	Recommendations made
Pumps (All dist. Pumping)	Not evaluated – see dist. survey
Monitoring & Reporting	No deficiencies/recommendations
Management & Operations	Recommendations made
Operator Compliance	Recommendations made
Security	No deficiencies/recommendations
Financial	Not Evaluated – see dist survey
Other	No deficiencies/recommendations

The following deficiencies are violations of Act 399 and must be resolved in order to return the water system to compliance.

1. R 325.11206 (1) of the Michigan Safe Drinking Water Act, 1976 PA 399, as Amended and the Administrative Rules requires a Type-I public water supply to provide a means to continuously supply finished water to the entire distribution system during periods when normal power service is interrupted. Although electrical power for the WTP is provided by a dual 46-KV primary electrical feed, the dual feed originates from the same switch yard and

this configuration will not address power issues that could occur with the generating utility or transmission grid. As an emergency stand-by WTP, additional provisions for stand-by power has not been required; however, additional provisions such as on-site generation will need to be provided if the WTP becomes a full-time operating facility.

Next, it is hoped that the following recommendations will prove useful in enhancing the operation and maintenance of your water supply.

1. Operate low service pumps #3 and #4 at P.S. #4 periodically between WTP test runs to ensure that the pumps and switchgear remain in operating condition. Replacement of the switchgear is also recommended in order to increase the flexibility of operation of the low service pump station.
2. Flint's long-term source of drinking water is expected to be determined soon as the scope of the Karegnondi Water Authority (KWA) is finalized. The city will need to determine the future use level of P.S #4 (low and high service pumping) to determine the amount of pumping capacity and other station improvements that will be needed.
3. Full chlorine concentration times contact time (CT) credit through the ozone contactor basins cannot be provided since ozone residuals cannot be maintained through the entire contactor basin. An additional sampling tap at the end of the diffusion chamber Cell #1 is recommended since this will allow for a slight increase in the CT determination.
4. Control of moisture in the flocculator control room is recommended in order to maintain other controls and electrical components in good working condition.
5. Although it is not practical to attempt lime softening given the limited duration of WTP test runs, longer plant runs (10 days or longer) are recommended if proficiency in softening is desired. The need for future softening; however, will depend on the city's long-term source of drinking water. Longer WTP test runs will also help determine filter run times and provide experience in backwashing filters during plant production.
6. Correct the piping constraint in the west wash water supply line. The existing line has an 8-inch restriction within an existing valve vault that limits flow. Elimination of the bottleneck will increase the capacity of the west wash water supply.
7. Provide emergency air-pack respirators for the WTP operators for use in the event of a chlorine gas leak at the treatment plant.
8. Provide an adequate seal on the door sweep for the chlorine gas room interior door. This provision will reduce the possibility of an accidental chlorine gas from spreading to the remainder of Pump Station No. 4.
9. Inspect the 3.0 million gallon clearwell and verify the integrity of the concrete base around each of the manhole vent. Please provide us with a copy of the inspection report.
10. The WTP is equipped with numerous valves that are essential for operation and isolation critical components of the treatment plant. We recommend that WTP operators continue to maintain and expand their program of operating critical WTP valves. Maintaining an active valve program will help to keep treatment plant valves in good operating condition;

thus maintaining the operating reliability of the treatment plant.

11. Prepare an accurate WTP yard piping diagram. The yard piping diagram should denote the location of buried piping on WTP grounds and their points of connection to the WTP, reservoirs, control stations, and the elevated tank.
12. Designate a back-up operator for the WTP. The back-up operator must have a complete treatment (F-4 or higher) certification.

Please submit a letter by *May 30, 2013* that outlines the city of Flint's plans and schedule to address the above items.

If you have any questions, feel free to contact me at (517) 335-6122; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 4th Floor North, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,

Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance

Enclosure

mfp:jr

cc: Mr. Howard Croft, Utilities Director, City of Flint
cc: Mr. Edward Kurtz, Emergency Manager, City of Flint
cc: Mr. Brent Wright, WTP Superintendent, City of Flint
cc: Ms. Inez Brown, Clerk, City of Flint

Rennaker, Joanne (DEQ)

From: Wells, Eden (DHHS)
Sent: Thursday, November 12, 2015 9:56 AM
To: Pete Levine
Cc: Howard Croft; Andy Leavitt; Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Re: Technical Advisory Team Information

Thank you all for your comments this AM--very helpful!

Eden

Eden V. Wells, MD, MPH, FACPM
 Chief Medical Executive
 Michigan Department of Health and Human Services
 201 Townsend Street, 5th Floor CVB
 Lansing, MI 48913
 Phone: 517-335-8011
 wellse3@michigan.gov

From: Pete Levine
Sent: Thursday, November 12, 2015 9:26 AM
To: Wells, Eden (DHHS)
Cc: Howard Croft; Andy Leavitt; Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Re: Technical Advisory Team Information

Eden, thanks for checking. I think that is a great pro-active plan. What I was cautioning against was the comments made in the TAC meeting designed to convince us that the change in lead levels after the change over to Flint River water has something to do with paint.

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society

4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone:810-7339925
 Fax:810-2303737
[email:plevine@gcms.org](mailto:plevine@gcms.org)

On Wed, Nov 11, 2015 at 6:19 PM, Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote:
 HI Pete,

I just want to check in on this one statement to be sure we are on the same page-I may be over-reading-as we go through the EBL investigations every child with a level of 5 or more is and will be undergoing a home investigation which will look at all sources of potential lead exposure, including potential water sources, regardless of the fact that the river source has switched. These home investigations have already begun by GCHD and additional PH staff.

My concern is that if we mitigate all of the potential water sources for a child, there will still be other environmental sources that should also be mitigated/abated as part of that investigation--I would hate to have the child continue to be exposed to any sources or lead, even as water is addressed?

My long-term view is that, as water sources improve (that is the goal!!), there will still be a need for general lead abatement, but I am not viewing this as a deflection as much as a need to consider for long-term public health planning.

Your thoughts welcome,

Eden

Eden V. Wells, MD, MPH, FACPM
 MDHHS
 Sent from my iPad

On Nov 11, 2015, at 9:57 AM, Pete Levine <plevine@gcms.org> wrote:

I also think it is important for folks to stop trying to deflect this crisis into a general lead abatement discussion.



This email has been sent from a virus-free computer protected by Avast.
www.avast.com

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society
 4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone:[810-7339925](tel:810-7339925)

Fax: 810-2303737
 email: plevine@gcms.org

On Tue, Nov 10, 2015 at 6:57 PM, Howard Croft <hcroft@cityofflint.com> wrote:
 Andy,

We just recently converted to the new method with no flushing, the vast majority were done with the old procedure. Our original expectation focused on the thought of a new standard being put in place statewide for uniformity but eventually, through conversations with Darren Lytle we made the decision to convert in advance of any potential statewide changes.

On Tue, Nov 10, 2015 at 6:40 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:
 Howard,

For clarity, of those hundreds of samples how many are with the flawed sampling method and how many are done with the appropriate sampling method?

Thanks,

Andy

On Tue, Nov 10, 2015 at 6:36 PM Howard Croft <hcroft@cityofflint.com> wrote:
 Marc,

I believe that we agree with that message, we are planing to pursue all of the people who were sampled under the previous protocol and request that they submit to another round of testing with the new procedures. We have generated hundreds of samples this year and we intend to aggressively reach out to everyone for retesting. We are building a campaign that will continue to caution people about taking safe measures for drinking water but also produces neighborhood sampling pools that test several times throughout the course of the year in addition to tier 1 pools.

On Tue, Nov 10, 2015 at 5:14 PM, Marc Edwards <edwardsm@vt.edu> wrote: .

No one should be told that if their water tested safe using the old MDEQ protocol, that it is ok to drink. I thought we learned that lesson already. The old sampling protocol is flawed.

Best Regards,

Marc

From: Howard Croft [<mailto:hcroft@cityofflint.com>]

Sent: Tuesday, November 10, 2015 4:56 PM

To: Andy Leavitt

Cc: Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; dykemal; Eden Wells (DHHS); edwardsm; George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike

Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green

Subject: Re: Technical Advisory Team Information

Andy,

We changed the instructions late last week that called for flushing, all bottles are now going out with the new protocol attached. We are concerned that some people are still not removing filters from the tap so we are trying to focus on that aspect of communication as well.

On Tue, Nov 10, 2015 at 1:59 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:

Hi Howard,

Can you confirm when Flint will move away from the testing mode that includes flushing?

Thanks,

Andy

On Mon, Nov 9, 2015 at 6:20 PM Wright, Michael <Wright.Michael@epa.gov> wrote:

Howard:

Thanks for arranging the meeting today. I didn't catch all of what Natasha (and others) said on the line but I was intrigued when I heard her mention a fact sheet or some information on Lead that was taken from a city in MA. Can you/she forward that URL for our review and consideration?

During the last call, I also noted my concern regarding boil advisories during a lead emergency and wanted to provide a link that documented what I said about Lead (and nitrates for that matter) being concentrated upon heating.

http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf

Lastly, I couldn't hear who made the comment, but I agree that infants are likely the most vulnerable of concern. So, I was wondering if the clinicians/health practitioners in the room might consider partnering or spearheading an outreach effort to target expectant mothers with the Filters that are being provided. Not sure if this is best done via prenatal clinics, delivery hospitals, OB-GYN departments, or lactation management specialists, etc. The public health practitioners might also be able to use this emergency as another reason to advocate breastfeeding (vs infant formula).

Thanks,
Mike

From: Howard Croft [<mailto:hcroft@cityofflint.com>]

Sent: Friday, November 06, 2015 3:48 PM

To: Amy Hovey <Amy.Hovey@mail.house.gov>; Andy Leavitt <aleavitt@senatedems.org>; Anthony Chubb <achubb@cityofflint.com>; Brent Wright <bwright@cityofflint.com>; Lytle,

Darren <Lytle.Darren@epa.gov>; Dayne Walling <dwalling@cityofflint.com>; Deborah Higgins <DeborahC@mottchc.org>; donna. cole <donna.cole@genesys.org>; dykemal <dykemal@mich.gov>; Eden Wells (DHHS) <wellse3@michigan.gov>; edwardsm <edwardsm@vt.edu>; George Krisztian (DEQ) <krisztian@michigan.gov>; Gerald (Jed) Natzke <gdn2@aol.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jamie Gaskin <jgaskin@unitedwaygenesee.org>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwws.com>; Kevin J. Keane <KEVIN.KEANE@cmsenergy.com>; Kirk Smith <ksmith@flint.org>; larry.koehler@mcc.edu; Laura Sullivan <dr.laura2@gmail.com>; Lawrence Reynolds <LawrenceR@mottchc.org>; Lawrence Reynolds <reynolds@mottchc.org>; Michael Glasgow <mglasgow@cityofflint.com>; Schock, Michael <Schock.Michael@epa.gov>; Wright, Michael <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; MVALACAK@gchd.us; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo@msu.edu; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Sean Kammer <skammer@cityofflint.com>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Stephen Busch (DEQ) <BUSCHS@michigan.gov>; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green <jwgreen@lan-inc.com>

Subject: Technical Advisory Team Information

All,

Enclosed please find the weekly update along with the agenda for next weeks Technical Advisory Committee meeting. The time and location remain at City Hall on the 3rd floor at 2:00 pm. There is a conference call in number available and we have modified the speaker system to accommodate all those who call in. If there are any questions, please do not hesitate to contact me.

Dial-in Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

Howard Croft

Public Works Director

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1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Pete Levine <plevine@gcms.org>
Sent: Thursday, November 12, 2015 9:28 AM
To: Andy Leavitt
Cc: Wells, Eden (DHHS); Howard Croft; Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna.cole; Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Re: Technical Advisory Team Information

Eden, As usual, Andy responded in a more cogent way than I did. Same point, better wording. Pete

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society
 4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone:810-7339925
 Fax:810-2303737
[email:plevine@gcms.org](mailto:plevine@gcms.org)

On Wed, Nov 11, 2015 at 7:16 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:
 Dr. Wells,

Once you engage in a home inspection there is no doubt we should be doing full abatement but speaking about paint and soil in the same breath as the water that clearly doubled EBL seems disingenuous. No doubt Flint had lead previously and will continue to have lead in the built environment, but looking at Flint's EBL pre-switch compared to other communities of similar age and make-up seems to indicate that Flint was doing fairly well at lowering levels before the water. We cannot rest on the fact that DWSD fixes the lead problem, but we also cannot conflate the catastrophe of the water with general lead risks. Anyone who does that will not be taken seriously by Flint residents.

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Eden V. Wells, MD, MPH, FACPM
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Subject: Re: Technical Advisory Team Information

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Eden, thanks for checking. I think that is a great pro-active plan. What I was cautioning against was the comments made in the TAC meeting designed to convince us that the change in lead levels after the change over to Flint River water has something to do with paint.

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The emergency/urgency /crisis/disaster is dealing with/arresting the progression of the lead in water then addressing the long known school water fountain situation .

The long term follow-up for our water requires addressing the accelerated disintegration of infrastructure ,community education and adequate funding for the local health department to address the other lead abatement , and developmental screening.

Additionally, the current Early On formula is based on the number of births but consideration should be given to the need for more expansive developmental screening and early childhood education –Head Start ,etc.

I appreciate the growing concern for big picture issues but we cannot ignore the immediate crisis precipitated by a cascade of errors and oversights .Remember , the other lead abatement issues were being addressed programmatically and ,hopefully ,will continue to be addressed with adequate funding and staff.

From: John O'Brien [mailto:jfobrien@gcdcwws.com]

Sent: Thursday, November 12, 2015 8:45 AM

To: 'Pete Levine'; Howard Croft

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Rennaker, Joanne (DEQ)

From: John O'Brien <jfobrien@gcdcwws.com>
Sent: Thursday, November 12, 2015 8:45 AM
To: 'Pete Levine'; Howard Croft
Cc: Andy Leavitt; Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: RE: Technical Advisory Team Information

We are not trying to deflect the issue. Is the goal to reduce blood lead levels in the population or to ride the Flint water mistake to a virtual end?

From: Pete Levine [mailto:plevine@gcms.org]
Sent: Wednesday, November 11, 2015 9:49 AM
To: Howard Croft
Cc: Andy Leavitt ; Marc Edwards ; Wright, Michael ; Amy Hovey ; Anthony Chubb ; Brent Wright ; Lytle, Darren ; Dayne Walling ; Deborah Higgins ; donna. cole ; dykemal ; Eden Wells (DHHS) ; George Krisztian (DEQ) ; Gerald (Jed) Natzke ; James Henry ; Jamie Gaskin ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kevin J. Keane ; Kirk Smith ; larry.koehler@mcc.edu; Laura Sullivan ; Lawrence Reynolds ; Lawrence Reynolds ; Michael Glasgow ; Schock, Michael ; Mike Lane ; Mike Prysby (DEQ) ; MVALACAK@gchd.us; Natasha Henderson ; Norb Birchmeier ; Robert Bincsik ; rosejo@msu.edu; Russell Hudson ; Samir Matta ; Sean Kammer ; Shawn Patrick McElmurry ; Stephen Busch (DEQ) ; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green
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This email has been sent from a virus-free computer protected by Avast.
www.avast.com

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society
 4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone: 810-7339925
 Fax: 810-2303737
 email: plevine@gcms.org

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I agree, Andy. Also our GCHD budget was cut from over \$7M to under \$2M . We are crippled by budget cuts.

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Dr. Wells,

Once you engage in a home inspection there is no doubt we should be doing full abatement but speaking about paint and soil in the same breath as the water that clearly doubled EBL seems disingenuous. No doubt Flint had lead previously and will continue to have lead in the built environment, but looking at Flint's EBL pre-switch compared to other communities of similar age and make-up seems to indicate that Flint was doing fairly well at lowering levels before the water. We cannot rest on the fact that DWSD fixes the lead problem, but we also cannot conflate the catastrophe of the water with general lead risks. Anyone who does that will not be taken seriously by Flint residents.

On Wed, Nov 11, 2015 at 6:20 PM Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote:

Hi Pete,

I just want to check in on this one statement to be sure we are on the same page-I may be over-reading-as we go through the EBL investigations every child with a level of 5 or more is and will be undergoing a home investigation which will look at all sources of potential lead exposure, including potential water sources, regardless of the fact that the river source has switched. These home investigations have already begun by GCHD and additional PH staff.

My concern is that if we mitigate all of the potential water sources for a child, there will still be other environmental sources that should also be mitigated/abated as part of that investigation--I would hate to have the child continue to be exposed to any sources or lead, even as water is addressed?

My long-term view is that, as water sources improve (that is the goal!!), there will still be a need for general lead abatement, but I am not viewing this as a deflection as much as a need to consider for long-term public health planning.

Your thoughts welcome,

Eden

Eden V. Wells, MD, MPH, FACPM
MDHHS
Sent from my iPad

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Executive Director
Genesee County Medical Society
4438 Oak Bridge Dr. Suite B
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City of Flint

1101 S. Saginaw Street

Flint, MI 48502

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hcroft@cityofflint.com

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Rennaker, Joanne (DEQ)

From: Andy Leavitt <aleavitt@senatedems.org>
Sent: Wednesday, November 11, 2015 7:16 PM
To: Wells, Eden (DHHS); Pete Levine
Cc: Howard Croft; Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Re: Technical Advisory Team Information

Dr. Wells,

Once you engage in a home inspection there is no doubt we should be doing full abatement but speaking about paint and soil in the same breath as the water that clearly doubled EBL seems disingenuous. No doubt Flint had lead previously and will continue to have lead in the built environment, but looking at Flint's EBL pre-switch compared to other communities of similar age and make-up seems to indicate that Flint was doing fairly well at lowering levels before the water. We cannot rest on the fact that DWSD fixes the lead problem, but we also cannot conflate the catastrophe of the water with general lead risks. Anyone who does that will not be taken seriously by Flint residents.

On Wed, Nov 11, 2015 at 6:20 PM Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote:
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Your thoughts welcome,

Eden

Eden V. Wells, MD, MPH, FACPM

MDHHS

Sent from my iPad

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I also think it is important for folks to stop trying to deflect this crisis into a general lead abatement discussion.



This email has been sent from a virus-free computer protected by Avast.
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Peter A. Levine, MPH
Executive Director
Genesee County Medical Society
4438 Oak Bridge Dr. Suite B
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Phone:810-7339925
Fax:810-2303737
[email:plevine@gcms.org](mailto:plevine@gcms.org)

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Subject: Re: TAC_Request for Input

I concur with Marc's recommendation. Essentially remove "but we do not recommend sampling if the faucet has sat idle for more than 12 hours." from Step 2. And supply 1 L wide-mouth bottles.

Shawn P. McElmurry, Ph.D., P.E.
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 Wayne State University
 Dept. of Civil and Environmental Engineering
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 Detroit, Michigan 48202
 Phone: 313-577-3876
 Fax: 313-577-3881
 Skype: s.mcelmurry
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Subject: Re: TAC_Request for Input
 Should we suspend handing out bottles until we get clarification on the procedures? We have consumers coming in daily for the lead and copper bottles.

Brent

On Wed, Nov 11, 2015 at 12:37 PM, Marc Edwards <edwardsm@vt.edu> wrote:

The standard EPA sampling instructions, do not tell consumers, that it is not recommended to collect the sample if the water stagnation time exceeds 6 hours.

That is another added MDEQ instruction. EPA has argued with MDEQ, to get that instruction removed, for years and years, and they refused.

The Federal Rule simply says to sample after water has been held in the pipe for more than 6 hours. I would advise you to just say that and keep it simple.

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Subject: TAC_Request for Input

Advisory Team,

Given the holiday scheduling, we are looking at Wednesday December 9th at 2:00 as the best opportunity to hold our next Advisory meeting. Please provide us with feedback on whether or not this is a convenient time for you to attend, we will give priority to our EPA partners in the final scheduling of the meeting.

I am also including a copy of our new NO FLUSH instructions that are now on all of our test bottles being distributed along with a draft copy of a letter that we plan to send to all residents that have been tested under the previous protocol. We will wait for comments on the letter prior to distributing it publicly.

We now have our City Hall lobby Information window staffed along with two screens. One screen will display information on water, filters, and testing, the other will display a video sent to us that demonstrates installation procedures with different filters.

Thank you,

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That is another added MDEQ instruction. EPA has argued with MDEQ, to get that instruction removed, for years and years, and they refused.

The Federal Rule simply says to sample after water has been held in the pipe for more than 6 hours. I would advise you to just say that and keep it simple.

Marc

From: Howard Croft [mailto:hcroft@cityofflint.com]
Sent: Wednesday, November 11, 2015 12:14 PM
To: Amy Hovey; Andy Leavitt; Anthony Chubb; Brent Wright; Darren Lytle; Dayne Walling; Deborah Higgins; donna. cole; dykemal; Eden Wells (DHHS); edwardsm; George Krisztian (DEQ); Gerald (Jed) Natzke; Howard Croft; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Michael Wright; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green
Subject: TAC_Request for Input

Advisory Team,

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Thank you,

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Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

|

--

Brent Wright

Water Plant Supervisor

City of Flint

4500 N. Dort Hwy.

Flint, MI. 48505

Ph: 810.787.6537 ext. 3510

Fx: 810.787.3710

Rennaker, Joanne (DEQ)

From: Marc Edwards <edwardsm@vt.edu>
Sent: Wednesday, November 11, 2015 12:37 PM
To: 'Howard Croft'; 'Amy Hovey'; 'Andy Leavitt'; 'Anthony Chubb'; 'Brent Wright'; 'Darren Lytle'; 'Dayne Walling'; 'Deborah Higgins'; 'donna. cole'; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); Krisztian, George (DEQ); 'Gerald (Jed) Natzke'; 'James Henry'; 'Jamie Gaskin'; 'Jason Lorenz'; 'jmikewright'; 'JoAnne Herman'; 'John O'Brien'; 'Kevin J. Keane'; 'Kirk Smith'; larry.koehler@mcc.edu; 'Laura Sullivan'; 'Lawrence Reynolds'; 'Lawrence Reynolds'; 'Michael Glasgow'; 'Schock, Michael'; 'Michael Wright'; 'Mike Lane'; Prysby, Mike (DEQ); MVALACAK@gchd.us; 'Natasha Henderson'; 'Norb Birchmeier'; 'Pete Levine'; 'Robert Bincsik'; rosejo@msu.edu; 'Russell Hudson'; 'Samir Matta'; 'Sean Kammer'; 'Shawn Patrick McElmurry'; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); 'Warren Green'
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City of Flint

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hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Marc Edwards <edwardsm@vt.edu>
Sent: Wednesday, November 11, 2015 12:15 PM
To: 'Shawn Patrick McElmurry'; 'Howard Croft'
Cc: 'Wright, Michael'; 'Amy Hovey'; 'Anthony Chubb'; 'Brent Wright'; 'Lytle, Darren'; 'Dayne Walling'; 'Higgins, Deborah'; 'donna. cole'; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); Krisztian, George (DEQ); 'Gerald (Jed) Natzke'; 'James Henry'; 'Jamie Gaskin'; 'Jason Lorenz'; 'jmikewright'; 'JoAnne Herman'; 'John O'Brien'; 'Kevin J. Keane'; 'Kirk Smith'; larry.koehler@mcc.edu; 'Laura Sullivan'; 'Michael Glasgow'; 'Schock, Michael'; 'Mike Lane'; Prysby, Mike (DEQ); MVALACAK@gchd.us; 'Natasha Henderson'; 'Norb Birchmeier'; 'Pete Levine'; 'Robert Bincsik'; rosejo@msu.edu; 'Russell Hudson'; 'Samir Matta'; 'Sean Kammer'; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); 'Warren Green'; 'Andy Leavitt'; 'Reynolds, Lawrence'
Subject: RE: Technical Advisory Team Information

Just using the standard EPA instructions, and giving the residents the wide mouth bottle...that would do it. That is our sampling protocol.

Marc

From: Shawn Patrick McElmurry [mailto:s.mcelmurry@wayne.edu]
Sent: Wednesday, November 11, 2015 10:19 AM
To: Howard Croft
Cc: Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Higgins, Deborah; donna. cole; dykemal; Eden Wells (DHHS); George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Schock, Michael; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green; Andy Leavitt; Reynolds, Lawrence
Subject: Re: Technical Advisory Team Information

I really like Lawrence's suggestion and believe this is an area where the Tech. Advisory Team (TAT) can provide assistance. I would like to suggest the this advisory panel develop a Standard Operating Procedure for sampling intended to fulfill the Lead & Copper Rule. I know there are excellent example protocols out there that we could build from but this is one way Flint can show leadership on this issue.

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Sincerely,
 Shawn McElmurry

Shawn P. McElmurry, Ph.D., P.E.
 Associate Professor
 Wayne State University
 Dept. of Civil and Environmental Engineering
 2158 Engineering Building

5050 Anthony Wayne Dr.
 Detroit, Michigan 48202
 Phone: 313-577-3876
 Fax: 313-577-3881
 Skype: s.mcelmurry
www.eng.wayne.edu/mcelmurry

From: Reynolds, Lawrence <LawrenceR@mottchc.org>

Sent: Wednesday, November 11, 2015 7:12 AM

To: Howard Croft; Andy Leavitt

Cc: Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Higgins, Deborah; donna. cole; dykemal; Eden Wells (DHHS); George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Schock, Michael; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green

Subject: RE: Technical Advisory Team Information

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From: Howard Croft [<mailto:hcroft@cityofflint.com>]

Sent: Tuesday, November 10, 2015 6:57 PM

To: Andy Leavitt

Cc: Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Higgins, Deborah; donna. cole; dykemal; Eden Wells (DHHS); George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Reynolds, Lawrence; Reynolds, Lawrence; Michael Glasgow; Schock, Michael; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green

Subject: Re: Technical Advisory Team Information

Andy,

We just recently converted to the new method with no flushing, the vast majority were done with the old procedure. Our original expectation focused on the thought of a new standard being put in place statewide for uniformity but eventually, through conversations with Darren Lytle we made the decision to convert in advance of any potential statewide changes.

On Tue, Nov 10, 2015 at 6:40 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:
 Howard,

For clarity, of those hundreds of samples how many are with the flawed sampling method and how many are done with the appropriate sampling method?

Thanks,

Andy

On Tue, Nov 10, 2015 at 6:36 PM Howard Croft <hcroft@cityofflint.com> wrote:

Marc,

I believe that we agree with that message, we are planing to pursue all of the people who were sampled under the previous protocol and request that they submit to another round of testing with the new procedures. We have generated hundreds of samples this year and we intend to aggressively reach out to everyone for retesting. We are building a campaign that will continue to caution people about taking safe measures for drinking water but also produces neighborhood sampling pools that test several times throughout the course of the year in addition to tier 1 pools.

On Tue, Nov 10, 2015 at 5:14 PM, Marc Edwards <edwardsm@vt.edu> wrote:

No one should be told that if their water tested safe using the old MDEQ protocol, that it is ok to drink. I thought we learned that lesson already. The old sampling protocol is flawed.

Best Regards,

Marc

From: Howard Croft [mailto:hcroft@cityofflint.com]

Sent: Tuesday, November 10, 2015 4:56 PM

To: Andy Leavitt

Cc: Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; dykemal; Eden Wells (DHHS); edwardsm; George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Binscik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green

Subject: Re: Technical Advisory Team Information

Andy,

We changed the instructions late last week that called for flushing, all bottles are now going out with the new protocol attached. We are concerned that some people are still not removing filters from the tap so we are trying to focus on that aspect of communication as well..

On Tue, Nov 10, 2015 at 1:59 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:

Hi Howard,

Can you confirm when Flint will move away from the testing mode that includes flushing?

Thanks,

Andy

On Mon, Nov 9, 2015 at 6:20 PM Wright, Michael <Wright.Michael@epa.gov> wrote:

Howard:

Thanks for arranging the meeting today. I didn't catch all of what Natasha (and others) said on the line but I was intrigued when I heard her mention a fact sheet or some information on Lead that was taken from a city in MA. Can you/she forward that URL for our review and consideration?

During the last call, I also noted my concern regarding boil advisories during a lead emergency and wanted to provide a link that documented what I said about Lead (and nitrates for that matter) being concentrated upon heating.

http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf

Lastly, I couldn't hear who made the comment, but I agree that infants are likely the most vulnerable of concern. So, I was wondering if the clinicians/health practitioners in the room might consider partnering or spearheading an outreach effort to target expectant mothers with the Filters that are being provided. Not sure if this is best done via prenatal clinics, delivery hospitals, OB-GYN departments, or lactation management specialists, etc. The public health practitioners might also be able to use this emergency as another reason to advocate breastfeeding (vs infant formula).

Thanks,

Mike

From: Howard Croft [mailto:hcroft@cityofflint.com]

Sent: Friday, November 06, 2015 3:48 PM

To: Amy Hovey <Amy.Hovey@mail.house.gov>; Andy Leavitt <aleavitt@senatedems.org>; Anthony Chubb <achubb@cityofflint.com>; Brent Wright <bwright@cityofflint.com>; Lytle, Darren <Lytle.Darren@epa.gov>; Dayne Walling <dwalling@cityofflint.com>; Deborah Higgins <DeborahC@mottchc.org>; donna.cole <donna.cole@genesys.org>; dykemal <dykemal@mich.gov>; Eden Wells (DHHS) <wellse3@michigan.gov>; edwardsm <edwardsm@vt.edu>; George Krisztian (DEQ) <krisztian@michigan.gov>; Gerald (Jed) Natzke <gdn2@aol.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jamie Gaskin <jgaskin@unitedwaygenesees.org>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdewws.com>; Kevin J. Keane <KEVIN.KEANE@cmsenergy.com>; Kirk Smith <ksmith@flint.org>; larry.koehler@mcc.edu; Laura Sullivan <dr.laura2@gmail.com>; Lawrence Reynolds <LawrenceR@mottchc.org>; Lawrence Reynolds <reynolds@mottchc.org>; Michael Glasgow <mglasgow@cityofflint.com>; Schock, Michael <Schock.Michael@epa.gov>; Wright, Michael <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; MVALACAK@gchd.us; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo@msu.edu; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Sean Kammer <skammer@cityofflint.com>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Stephen Busch (DEQ) <BUSCHS@michigan.gov>; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green <jwgreen@lan-inc.com>

Subject: Technical Advisory Team Information

All,

Enclosed please find the weekly update along with the agenda for next weeks Technical Advisory Committee meeting. The time and location remain at City Hall on the 3rd floor at 2:00 pm. There is a conference call in number available and we have modified the speaker system to accommodate all those who call in. If there are any questions, please do not hesitate to contact me.

Dial-in Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

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Rennaker, Joanne (DEQ)

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Subject: TAC_Request for Input
Attachments: Lead_Copper_Sampling_Instruction (No Flush).pdf; Retest letter_DRAFT.pdf

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 Flint, MI 48502
 PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Drinking Water Lead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in your drinking water. It is important that you follow these instructions so that we may collect an accurate measurement of the lead and copper in your drinking water. This sample is supposed to represent the water you would typically drink and the faucet from where you would drink the water. Call your water supply if you have any questions.

1. Select a faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT sample from a laundry sink or a hose spigot as these samples cannot be used by your utility.
2. Wait at least 6 hours before collecting your sample but we do not recommend sampling if the faucet has sat idle for more than 12 hours.
3. Fill the sample bottle to the neck with the "first draw" of COLD water.
4. Please answer the following questions:

a) What date and time did you **fill the bottle**? Date _____ Time _____ A.M.

b) Which faucet did you use to fill the bottle? ☐ Kitchen ☐ Main Bathroom ☐ Other
If OTHER, please describe: _____

c) Is this faucet connected to a home treatment device such as a water softener, a reverse osmosis unit, an iron removal device OR is any kind of additive used in the home? ☐ Yes ☐ No
If YES, please describe: _____

Your Printed Name _____

Your Address _____

Your Signature _____

5. Attach this form to the bottle and leave it outside your front door and call to arrange pick up.

If you have any questions about sampling call:

Water Supply: City of Flint

Manager or
Water Operator: Brent Wright

Phone: (810) 787-6537

To schedule sample pick up call:

Wendy Braun: (810) 766-7135 ext. 2606

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year. We will send you the results within 30 days of receiving them. Contact your utility if you have any questions.

Dear Resident,

The City of Flint Utility Division has recently amended our lead and copper testing procedure and are now using a NO-FLUSH protocol. The new method is designed to provide a more accurate gauge of the amount of lead exposure that may exist in the plumbing.

We are requesting that all residents who have had their water tested for lead and copper submit to another test so that we may provide you with a current report. The City has multiple methods available for you to arrange another water test, obtain a water filter, or a replacement cartridge:

- 1) Call the Water Treatment Plant at 810-787-6537
- 2) Call Our DPW Service Specialist at 810-766-7105 x 2606
- 3) Email flintwater@cityofflint.com
- 4) Come in to the INFORMATION window in the Lobby of City Hall

Bottles for water testing can be picked up at the Water Treatment Plant or at City Hall. You may also arrange for bottles to be delivered to your individual home or business. We ask that you please encourage other neighbors and residents to get their water tested as well by sharing this information with them.

Thank you,

Sincerely,

Mike Glasgow
Utilities Administrator
810-787-6537 x 3512

Howard Croft
Public Works Director
810-766-7346 x 2043

Rennaker, Joanne (DEQ)

From: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>
Sent: Wednesday, November 11, 2015 10:19 AM
To: Howard Croft
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Subject: Re: Technical Advisory Team Information

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Shawn P. McElmurry, Ph.D., P.E.
 Associate Professor
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 Dept. of Civil and Environmental Engineering
 2158 Engineering Building
 5050 Anthony Wayne Dr.
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 Phone: 313-577-3876
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 Skype: s.mcelmurry
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From: Reynolds, Lawrence
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Cc: Marc Edwards; Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Higgins, Deborah; donna. cole; dykemal; Eden Wells (DHHS); George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Reynolds, Lawrence; Reynolds, Lawrence; Michael Glasgow; Schock, Michael; Mike Lane; Mike Prysby (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Stephen Busch (DEQ); swalser@senatedems.org; thompsons2@michigan.gov; Warren Green

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Howard,

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Subject: Re: Technical Advisory Team Information

I also think it is important for folks to stop trying to deflect this crisis into a general lead abatement discussion.



This email has been sent from a virus-free computer protected by Avast.
www.avast.com

Peter A. Levine, MPH
 Executive Director
 Genesee County Medical Society
 4438 Oak Bridge Dr. Suite B
 Flint, Mi. 48532
 Phone: 810-7339925
 Fax: 810-2303737
 email: plevine@gcms.org

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Subject: Re: Technical Advisory Team Information

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Thanks,

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Dial-in Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

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Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Tuesday, November 10, 2015 4:56 PM
To: Andy Leavitt
Cc: Wright, Michael; Amy Hovey; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Re: Technical Advisory Team Information

Andy,

We changed the instructions late last week that called for flushing, all bottles are now going out with the new protocol attached. We are concerned that some people are still not removing filters from the tap so we are trying to focus on that aspect of communication as well..

On Tue, Nov 10, 2015 at 1:59 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:
 Hi Howard,

Can you confirm when Flint will move away from the testing mode that includes flushing?

Thanks,

Andy

On Mon, Nov 9, 2015 at 6:20 PM Wright, Michael <Wright.Michael@epa.gov> wrote:

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To: Amy Hovey <Amy.Hovey@mail.house.gov>; Andy Leavitt <aleavitt@senatedems.org>; Anthony Chubb <achubb@cityofflint.com>; Brent Wright <bwright@cityofflint.com>; Lytle, Darren <Lytle.Darren@epa.gov>; Dayne Walling <dwalling@cityofflint.com>; Deborah Higgins <DeborahC@mottchc.org>; donna. cole <donna.cole@genesys.org>; dykemal <dykemal@mich.gov>; Eden Wells (DHHS) <wellse3@michigan.gov>; edwardsm <edwardsm@vt.edu>; George Krisztian (DEQ) <krisztian@michigan.gov>; Gerald (Jed) Natzke <gdn2@aol.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jamie Gaskin <jgaskin@unitedwaygenesees.org>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwvs.com>; Kevin J. Keane <KEVIN.KEANE@cmsenergy.com>; Kirk Smith <ksmith@flint.org>; larry.koehler@mcc.edu; Laura Sullivan <dr.laura2@gmail.com>; Lawrence Reynolds <LawrenceR@mottchc.org>; Lawrence Reynolds <reynolds@mottchc.org>; Michael Glasgow <mglasgow@cityofflint.com>; Schock, Michael <Schock.Michael@epa.gov>; Wright, Michael <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; MVALACAK@gchd.us; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo@msu.edu; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Sean Kammer <skammer@cityofflint.com>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Stephen Busch (DEQ) <BUSCHS@michigan.gov>; swalser@senatedems.org; thompsons2@michigan.gov; Warren Green <jwgreen@lan-inc.com>

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From: Wright, Michael <Wright.Michael@epa.gov>
Sent: Monday, November 09, 2015 6:21 PM
To: Howard Croft; Amy Hovey; Andy Leavitt; Anthony Chubb; Brent Wright; Lytle, Darren; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
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Sent: Friday, November 06, 2015 3:48 PM

To: Amy Hovey ; Andy Leavitt ; Anthony Chubb ; Brent Wright ; Lytle, Darren ; Dayne Walling ; Deborah Higgins ; donna. cole ; dykemal ; Eden Wells (DHHS) ; edwardsm ; George Krisztian (DEQ) ; Gerald (Jed) Natzke ; Howard Croft ; James Henry ; Jamie Gaskin ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kevin J. Keane ; Kirk Smith ; larry.koehler@mcc.edu ; Laura Sullivan ; Lawrence Reynolds ; Lawrence Reynolds ; Michael Glasgow ; Schock, Michael ; Wright, Michael ; Mike Lane ; Mike Prysby (DEQ) ; MVALACAK@gchd.us ; Natasha Henderson ; Norb Birchmeier ; Pete Levine ; Robert Bincsik ; rosejo@msu.edu ; Russell Hudson ; Samir Matta ; Sean Kammer ; Shawn Patrick McElmurry ; Stephen Busch (DEQ) ; swalser@senatedems.org ; thompsons2@michigan.gov ; Warren Green
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From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 09, 2015 4:51 PM
To: Krisztian, George (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT ACTION STEPS - DRAFT DELIBERATIVE
Attachments: DRAFT Action Steps Week of November 9-13.docx

DRAFT attached.

From: Krisztian, George (DEQ)
Sent: Monday, November 09, 2015 3:02 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Weekly Update - DRAFT DELIBERATIVE
Importance: High

We need to have a new list of objectives for this week that we will submit to the Governor next week.

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
 Cell ph (517) 420-5897

From: Shekter Smith, Liane (DEQ)
Sent: Friday, November 06, 2015 4:49 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Daily Update - DRAFT DELIBERATIVE

Action Step No. 9 Email city of Flint regarding timing to install corrosion control now that the construction permit has been issued.

Staff e-mailed Michael Glasgow and Brent Wright on Nov. 4th requesting a timeline and a request to notify us when the phosphate equipment is installed. Brent responded on Nov 5th noting that the city just received the Act 399 permit in the mail on the 5th. Equipment is to be ordered by the end of this week and plant operators plan to start installing the feed piping on Monday Nov 9th.

Action Step No. 10 Review MORs for stand-by operation of the Flint WTP with the city of Flint; draft letter to city of Flint documenting standby operation requirements.

| Draft letter detailing standby operation requirements is currently being prepared and will be sent to the city next week. Review of the standby operation monthly operation reports (MORs) with the city of Flint will be conducted during the next routine site visit at the water treatment plant.

Action Step No. 12 Continue evaluating city of Flint service line record status and comparison to sampling pool.

A letter has been prepared that requests the city of Flint to provide additional information and documentation regarding all of their historic lead and copper rule (LCR) compliance sampling sites and to compare the service line information reported on the LCR compliance monitoring certification reports against the service line information from the city's digitized index cards. Conflicts noted between the index cards and the LCR compliance monitoring certification will need further explanation and the city will need to provide supporting documentation demonstrating these sites meet Tier 1 criteria. The letter will be provided to the city on Monday Nov. 9th

Action Step No. 15 Develop draft sampling protocol for residential exposure assessment for DHHS.

Draft document under development. Discussed preliminary plan with DHHS staff.

Action Step No. 16 Make progress on drafting a generic school sampling guidance document for statewide distribution.

| Draft document is under development. Staff are working on making this an easy to read and follow guidance document.

Action Step No. 17 Attend meeting arranged by DHHS regarding Residential EBL Investigations and Water Testing

Done. DEQ staff met with DHHS to discuss residential elevated blood lead investigations and a protocol for water testing.

City of Flint Water Action Steps for Week of November 9-13

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	Meeting held on 10/29/15 to discuss time line
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	Draft language submitted to Maggie Pallone for review
3.	Assist After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	Panel created and press release issued on 10/21/15
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	Negotiations underway to contract with the Genesee County Health Department
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	A summary report for Freeman Elementary School has been drafted
7.	Follow up with city of Flint regarding corrosion control treatment and their plans to address requirements and options provided for in 10/30/15 DEQ letter	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
8.	Follow-up with city of Flint regarding installation of corrosion control	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	E-mailed city of Flint on 11/4/15; 11/5/15 response indicated equipment to be ordered and plan to start installing feed piping on 11/9/15
9.	Review Monthly Operation Reports (MORs) for Standby Operation of Flint Water Treatment Plant with city of Flint; draft letter to city of Flint documenting Standby Operation requirements	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	Letter is drafted and will be sent to city of Flint the week of 11/9/15; MOR review with city of Flint will be conducted during next routine site visit
10.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues; check weekly for status update	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	Issues regarding soil erosion controls during construction are being addressed
11.	Continue evaluating city of Flint Service Line Record status and comparison to sampling pool	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	Letter requesting additional information/documentation to be provided to city of Flint on 11/9/15
12.	Provide DHHS with any available cross-reference information regarding lead service lines and plumbing materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Develop draft sampling protocol for residential exposure assessment for DHHS	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	Draft document under development; discussed preliminary plan with DHHS

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
14.	Make progress on drafting a generic school sampling guidance document for statewide distribution; target audience: schools served by municipal water	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	Draft document under development to make it an easy-to-read and follow guidance document
15.	Attend Technical Advisory Committee meeting on November 9, 2015	DEQ	Jim Sygo Mike Prysby	
16.	Draft Summary Reports for Brownell Elementary and Eisenhower Elementary	DEQ and LARA	George Krisztian Steve Busch	
17.	Conduct Plumbing Assessments at Durant-Tuuri-Mott Elementary and Central Kitchen	DEQ and LARA	George Krisztian Steve Busch	
18.	Conduct Sampling at Durant-Tuuri-Mott Elementary and Central Kitchen	DEQ and LARA	Jim Sygo George Krisztian Mike Prysby	
19.	Evaluate Lab Analysis and Perform Data Compilation for Doyle Ryder Elementary and Pierce Elementary	DEQ	George Krisztian Steve Busch Mike Prysby	

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Subject: Lead and Copper Rule Compliance Sampling Sites Letter
Attachments: Flint lead serv. ltr.pdf

Please see the attached letter.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

November 9, 2015

Mr. Michael Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

WSSN: #2310

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Compliance Communication
Lead and Copper Rule Compliance Sampling Sites

The City community water system is subject to the requirements of the Michigan Safe Drinking Water Act, 1976 Public Act 399, as amended (Act 399). According to Department of Environmental Quality (DEQ) records, City reports submitted to the DEQ regarding Lead and Copper Rule (LCR) compliance monitoring information have been certified by the City that all LCR compliance monitoring since 1992 has been conducted at sampling sites meeting the Tier 1 criteria listed under subrule 1c of administrative rule 710a (R325.10710a).

The City's recent efforts to electronically convert customer service line information and statements by some of the City's certified operators conflict with the information provided in the City's LCR compliance monitoring certification reports.

Therefore, the DEQ is hereby requesting the City provide additional information and documentation regarding all 324 historic LCR compliance sampling sites.

As of November 3, 2015, the City's electronic database of customer service connections listed 10,895 records of converted customer service connection index cards. The City has recently indicated it has a total of 29,072 customer service connections, leaving approximately 18,177 records left to be converted. These digital records include a listing of the service line material.

The DEQ has obtained a copy of these 10,895 digital records and cross referenced them with the addresses for the City's 324 historic LCR compliance monitoring sites. However, only 46 of the 324 sites were able to be matched at the current time. Of these 46 sites, only 6 sites contained information confirming the Tier 1 site criteria based on having lead service line materials. 14 sites were listed as having no available information (n/a), and require additional documentation to justify being designated as a Tier 1 sample site having a lead service line. The remaining 26 cross referenced sites were listed as having copper service line materials which directly conflicts with the City's LCR reports certifying these sites as Tier 1 based on the criteria of having a lead service line. The City needs to provide additional information to the DEQ demonstrating these sites meet the Tier 1 site criteria or we will assume they do not.

The City's remaining 278 historic LCR compliance sampling sites must also be reviewed and will require additional documentation to justify being designated as Tier 1 sample sites.

Mr. Michael Glasgow

2

November 9, 2015

Our office has provided the enclosed table that lists all 324 of the City's historic LCR compliance monitoring sites, when each site was utilized, the City's certification information for each site, and information cross referenced from the City's customer service line database. The City can use the far right column in this table, labeled *Justification of Lead Service Line and Tier 1 Criteria*, to summarize the City's justification for certifying these sites as Tier 1 and having a lead service line. Any supporting documentation regarding the justification for each site needs to be provided as separate attachments.

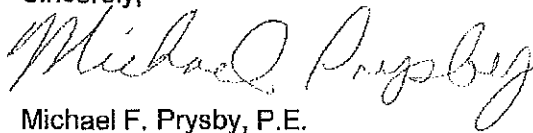
As a reminder, in accordance with subrule 1 of administrative rule 710a (R325.10710a), by January 1, 1992, the City was to have completed a materials evaluation of its distribution system to identify a pool of targeted sampling sites from which all first draw samples are collected. This evaluation was required to include information from:

- Special Monitoring for Corrosivity Characteristics
- All plumbing codes, permits, and records in the files of the building department or departments that indicate the plumbing materials installed within publically and privately owned structures connected to the water distribution system.
- All inspections and records of the distribution system indicating material composition of customer service connections.
- Water quality information that indicates locations which may be particularly susceptible to high lead or copper concentrations.

The completed table and all supporting documentation must be provided to our office as soon as possible, but by no later than December 30, 2015, prior to the next LCR compliance monitoring period.

Please contact me at 517-290-8817 or prysbym@michigan.gov at your earliest convenience to discuss this matter in more detail.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Lansing District Office
Office of Drinking Water and
Municipal Assistance

cc: Mr. Robert Bisnick, City of Flint
Mr. Brent Wright, City of Flint
Mr. Howard Kroft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Jim Sygo, Chief Deputy Director, DEQ
Mr. Stephen Busch, DEQ
Mr. Adam Rosenthal, DEQ

Rennaker, Joanne (DEQ)

From: Shaler, Karen (DEQ)
Sent: Monday, November 09, 2015 11:35 AM
To: Shekter Smith, Liane (DEQ)
Cc: Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ); Sygo, Jim (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)
Subject: RE: update to weekly report - DRAFT DELIBERATIVE

Got it. Thanks!

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 09, 2015 11:34 AM
To: Shaler, Karen (DEQ)
Cc: Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ); Sygo, Jim (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)
Subject: update to weekly report - DRAFT DELIBERATIVE

Suggestions for inclusion in the weekly governor's report:

Concerns –

The state is being criticized as a result of recent information coming to light that a significant number of samples were not collected from proper sampling locations as part of the sampling program in the City of Flint to demonstrate compliance with the lead/copper rule under the Safe Drinking Water Act. Recently, the City of Flint began to electronically convert customer service line information. This effort along with statements by some of the City's certified operators directly conflict with information certified by the City in documents referred to as lead/copper rule compliance monitoring certification reports.

Correspondence is drafted and will be sent to the City requesting the City provide appropriate documentation to demonstrate that the sampling locations selected and certified by the City comply with the Safe Drinking Water Act. In the absence of appropriate justification/documentation, the City of Flint may be subject to enforcement for violation of the Safe Drinking Water Act.

Significant Event –

On November 3, 2015, the U.S. Environmental Protection Agency issued a memorandum to address "certain concerns raised about the application of the 1991 Lead and Copper Rule, specifically the requirements pertaining to maintenance of optimal corrosion control treatment, in situations in which a large water system ceases to purchase treated water and switches to a new drinking water source." The memo states that "This type of situation rarely arises and the language of the LCR does not specifically discuss such circumstances. After the reviewing the rule with our Office of General Counsel, it appears that there are differing possible interpretations of the LCR with respect to how the rule's optimal corrosion control treatment procedures apply to this situation"...

This EPA memorandum clarifies the requirements should a situation like Flint occur again in the future. However, it clearly recognizes that the options chosen by Michigan were one interpretation or option of the rule.

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Rennaker, Joanne (DEQ)

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Sent: Friday, November 06, 2015 4:49 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Daily Update - DRAFT DELIBERATIVE

Action Step No. 9 Email city of Flint regarding timing to install corrosion control now that the construction permit has been issued.

Staff e-mailed Michael Glasgow and Brent Wright on Nov. 4th requesting a timeline and a request to notify us when the phosphate equipment is installed. Brent responded on Nov 5th noting that the city just received the Act 399 permit in the mail on the 5th. Equipment is to be ordered by the end of this week and plant operators plan to start installing the feed piping on Monday Nov 9th.

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Draft letter detailing standby operation requirements is currently being prepared and will be sent to the city next week. Review of the standby operation monthly operation reports (MORs) with the city of Flint will be conducted during the next routine site visit at the water treatment plant.

Action Step No. 12 Continue evaluating city of Flint service line record status and comparison to sampling pool.

A letter has been prepared that requests the city of Flint to provide additional information and documentation regarding all of their historic lead and copper rule (LCR) compliance sampling sites and to compare the service line information reported on the LCR compliance monitoring certification reports against the service line information from the city's digitized index cards. Conflicts noted between the index cards and the LCR compliance monitoring certification will need further explanation and the city will need to provide supporting documentation demonstrating these sites meet Tier 1 criteria. The letter will be provided to the city on Monday Nov. 9th

Action Step No. 15 Develop draft sampling protocol for residential exposure assessment for DHHS.

Draft document under development. Discussed preliminary plan with DHHS staff.

Action Step No. 16 Make progress on drafting a generic school sampling guidance document for statewide distribution.

Draft document is under development. Staff are working on making this an easy to read and follow guidance document.

Action Step No. 17 Attend meeting arranged by DHHS regarding Residential EBL Investigations and Water Testing

Done. DEQ staff met with DHHS to discuss residential elevated blood lead investigations and a protocol for water testing.

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, November 06, 2015 4:30 PM
To: Krisztian, George (DEQ)
Subject: FW: Technical Advisory Team Information
Attachments: TAC Agenda 11_9_15.pdf; TAC Update 11_06_15.pdf

George,

I am forwarding you next Monday's TAC meeting agenda.

Michael Prysby, P.E.
 District Engineer
 Office of Drinking Water and Municipal Assistance
 517 290-8817

From: Howard Croft [<mailto:hcroft@cityofflint.com>]
Sent: Friday, November 06, 2015 3:48 PM
To: Amy Hovey; Andy Leavitt; Anthony Chubb; Brent Wright; Darren Lytle; Dayne Walling; Deborah Higgins; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; Howard Croft; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Michael Wright; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); swalser@senatedems.org; Thompson, Sheryl D. (DHHS); Warren Green
Subject: Technical Advisory Team Information

All,

Enclosed please find the weekly update along with the agenda for next weeks Technical Advisory Committee meeting. The time and location remain at City Hall on the 3rd floor at 2:00 pm. There is a conference call in number available and we have modified the speaker system to accommodate all those who call in. If there are any questions, please do not hesitate to contact me.

Dial-in Number: (641) 715-3580
 Access Code: 373-510

PIN: 1234

Thank you,

--

Howard Croft
 Public Works Director
 City of Flint
 1101 S. Saginaw Street
 Flint, MI 48502

PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com



Flint Water Advisory Committee
November 9, 2015 2:00 pm
Flint City Hall

Agenda

2:00 pm Welcome,

Opening Comments – Natasha Henderson, City Administrator
Howard Croft, Public Works Director

Introduction of New Mayor
Technical Advisory Committee Purpose
Last Meeting Recap
Weekly Updates
Recognition of New Attendees/Members

2:10 pm Corrosion Control

Discussion - Corrosion Control

Warren Green, LAN
o Dosing
o Timeline

Darren Lytle, EPA
o Comments

Mike Glasgow, COF Utilities Administrator
o Testing

2:50 pm Public Health Update:

Discussion – Q & A on Public Health Efforts

Jim Henry, Genesee County Health Department
George Krisztian, DEQ

3:15 pm Public Education:

Discussion on Communication

Howard Croft, DPW Director
Joan Rose, MSU
Edin Wells, MDHHS
Jim Henry, Genesee County Health Department

3:40 pm Open Discussion

3:50 Next Steps

Action items?
Next meeting, December or January?

4:00 pm Adjourn



City of Flint
Technical Advisory Committee - Weekly Report

November 6th, 2015

Last meeting: 10-7-2015

Next meeting: 11-09-2015, 2:00 pm

I. Overview

We are encouraged that many of the Committee members have confirmed their attendance at Monday's Technical Advisory meeting. We have included the call in number, and access code below for those who must participate by phone.

Dial-In Number: (641) 715-3580

Access Code: 373-510

PIN: 1234

II. New items this week

- A. The Permit for corrosion control was received from the DEQ and we are beginning the process of ordering pumps and building a defined project schedule. Additional phosphate was approved and it is expected that we will begin introducing it into the water within thirty days.
- B. Attention is being given to filters that may be losing their usefulness. The City is coordinating with GCARD for filters and new cartridges to be distributed at City Hall as well as other locations. The best place for filter information is to call 211.

III. Items of concern or in process

A. Public Education

With the switch back to Detroit now complete and water reaching every tap there is some concern that residents could be removing filters or having the sense that everything is back to normal. We continue to work at an enhanced communication strategy that informs residents of the potential risks that still exist.

B. Corrosion Control

Questions remain about the overall impact of the additional phosphate. This will become a topic of discussion in the next Technical Advisory meeting and is important to be included in Public information. The added phosphate is expected to be introduced into the water within the next 30 days.

C. Service Lines

With the proposal in motion to complete the mapping of the service lines, we are focusing on the full development of a lead line replacement program and the funding sources. The preferred target would be to have a program in place to begin at the start of next construction season.

IV. Needs for treating and using water from KWA

Several outstanding items remain to be accomplished in order to be prepared to treat water from KWA when it arrives. Many of these items are time-sensitive and need to be decided and construction started as soon as possible.

- A. Discussion with KWA on the need for pipe construction into the Water Plant.
- B. Design and construction of transfer station to Dort Reservoir
- C. Raw water line to pump station #4
 - Needed to connect into existing 72" for raw water to reach the Plant.
- D. Alum feed system
 - Needed for coagulant change to raw water and to reduce chloride.

V. Testing Data

The following data will continue to be updated weekly, please feel free to request any additional information that may help any particular cause.

Date	Flow (MGD)	pH (S.U.)	Total Hardness (mg/L)	Total Alkalinity (mg/L)	Non-carbonate Hardness (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Total Phosphate (mg/L)
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10/26/2015	12	7.36	102	74	28	11	30.5	6.3	1.14
10/27/2015	12.5	7.39	100	74	26	13	29.7	6.3	n/a
10/28/2015	11.9	7.48	100	72	28	12	31.3	5.3	1.26
10/29/2015	11.7	7.46	100	72	28	12	29.7	6.3	1.29
10/30/2015	13.9	7.22	104	72	32	13	30.5	6.8	n/a
10/31/2015	11.8	7.37	100	72	28	14	33.7	6.8	n/a
11/1/2015	11.4	7.42	102	74	26	12	32.1	5.3	1.14
11/2/2015	11.9	7.38	100	72	28	11	31.3	5.3	1.2
11/3/2015	10.5	7.39	98	72	26	12	30.5	5.3	1.2

VI. Partnering Agencies

The following list represents many of the group's, agencies, or task force teams that are currently working in some form of cooperation with the City of Flint in an attempt to provide safe water to the residents. Contact information and individual scopes of work are noted and we encourage communication between all entities.

 City of Flint Partnering Agencies assisting with Water				
Group / Entity	Contact Name	With	Email Address	Scope of Work
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Governor's Task Force	Madhu Anderson	State of Michigan	AndersonM30@michigan.gov	After Action Review of Switch from DWSD to the Flint River
Wayne St. University Dept. of Civil & Environmental Engineering	Shawn McElmurry Associate Prof.	Wayne State	s.mcelmurry@wayne.edu	Research Project - Evaluating how changes in the drinking water system impact water quality.
U of M Flint Dept. of Earth & Resource Science	Marty Kaufman	U of M Flint	martyk@umflint.edu	Research Project - Evaluating the impact of antiquated infrastructure on health.
U of M Flint Dept. of Earth & Resource Science	Marty Kaufman	U of M Flint	martyk@umflint.edu	Mapping of service lines.
Virginia Tech University	Marc Edwards	Virginia Tech	edwardsm@vt.edu	Water testing & expert analysis
Genesee County Health Department	Mark Valacek Jim Henry	GCHD	mvalacek@gchd.us jhenry@gchd.us	Health Information Blood testing
Genesee County Health Department	Hilda McShane	GCHD	hmcshane@gchd.us	Daily health department updates
GCCARD	Matt Purcell	GCARD	mpurcell@co.genesee.mi.us	Coordination and distribution point for free water filters.
United Way	Jamie Gaskin	United Way	jgaskin@unitedwaygenesee.org	Facilitated and organized water filter distribution.
Department of Health & Human Services	Linda Dykema	MDHHS	DykemaL@michigan.gov	Working with the City & the DEQ Task force on lead testing.
Department of Health & Human Services	Edin Wells	MDHHS	wellse3@michigan.gov	State Health Advisor
Lockwood Andrews & Newnam	Warren Green	LAN	jwgreen@lan-inc.com	Engineering Consultants
Dept. of Licensing and Regulatory Affairs	Shelly Edgerton	LARA	edgertonsl@michigan.gov	Support for school testing

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, November 06, 2015 4:14 PM
To: Shekter Smith, Liane (DEQ); Krisztian, George (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Action Steps - Week of November 2-6

Liane, George

Below is an update of the Action Steps worked on for the week ending Nov. 6th.

Action Step No. 9 Email city of Flint regarding timing to install corrosion control now that the construction permit has been issued.

Emailed Michael Glasgow and Brent Wright on Nov. 4th requesting a timeline and a request to notify us when the PO4 equipment is installed. Brent responded on Nov 5th noting that the city just received the Act 399 permit in the mail on the 5th. Equipment is to be ordered by the end of this week and plant operators plan to start installing the feed piping on Monday Nov 9th.

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District Engineer
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517 290-8817

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 Public Works Director
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 Flint, MI 48502
 PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com



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November 9, 2015 2:00 pm
Flint City Hall

Agenda

- 2:00 pm Welcome,**
- Opening Comments – Natasha Henderson, City Administrator
Howard Croft, Public Works Director
- Introduction of New Mayor
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Weekly Updates
Recognition of New Attendees/Members
- 2:10 pm Corrosion Control**
- Discussion - Corrosion Control
Warren Green, LAN
- o Dosing
 - o Timeline
- Darren Lytle, EPA
- o Comments
- Mike Glasgow, COF Utilities Administrator
- o Testing
- 2:50 pm Public Health Update:**
- Discussion – Q & A on Public Health Efforts
Jim Henry, Genesee County Health Department
George Krisztian, DEQ
- 3:15 pm Public Education:**
- Discussion on Communication
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Governor's Task Force	Madhu Anderson	State of Michigan	AndersonM30@michigan.gov	After Action Review of Switch from DWSD to the Flint River
Wayne St. University Dept. of Civil & Environmental Engineering	Shawn McElmurry Associate Prof.	Wayne State	s.mcelmurry@wayne.edu	Research Project - Evaluating how changes in the drinking water system impact water quality.
U of M Flint Dept. of Earth & Resource Science	Marty Kaufman	U of M Flint	martyk@umflint.edu	Research Project - Evaluating the impact of antiquated infrastructure on health.
U of M Flint Dept. of Earth & Resource Science	Marty Kaufman	U of M Flint	martyk@umflint.edu	Mapping of service lines.
Virginia Tech University	Marc Edwards	Virginia Tech	edwardsm@vt.edu	Water testing & expert analysis
Genesee County Health Department	Mark Valacek Jim Henry	GCHD	mvalacek@gchd.us jhenry@gchd.us	Health Information Blood testing
Genesee County Health Department	Hilda McShane	GCHD	hmcshane@gchd.us	Daily health department updates
GCCARD	Matt Purcell	GCARD	mpurcell@co.genesee.mi.us	Coordination and distribution point for free water filters.
United Way	Jamie Gaskin	United Way	jgaskin@unitedwaygenesee.org	Facilitated and organized water filter distribution.
Department of Health & Human Services	Linda Dykema	MDHHS	DykemaL@michigan.gov	Working with the City & the DEQ Task force on lead testing.
Department of Health & Human Services	Edin Wells	MDHHS	wellse3@michigan.gov	State Health Advisor
Lockwood Andrews & Newnam	Warren Green	LAN	jwgreen@lan-inc.com	Engineering Consultants
Dept. of Licensing and Regulatory Affairs	Shelly Edgerton	LARA	edgertonsl@michigan.gov	Support for school testing

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Thursday, November 05, 2015 5:14 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: RE: Drinking Water Report
Importance: High

Please provide me with your information by COB on Friday (11/06/15). Please make sure you include the additional items as requested by the Governor.

Thank you!
 George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
Cell ph (517) 420-5897

From: Thelen, Mary Beth (DEQ)
Sent: Thursday, November 05, 2015 1:22 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ); Shaler, Karen (DEQ); Wyant, Dan (DEQ)
Subject: Drinking Water Report
Importance: High

George,

The Governor has asked for our Monday reports to include some additional information/format as described below for each Monday.

He asked that they include: key actions, positions, concerns, changes from previous report, and checklist on what is supposed to be done and when.

Thanks.

From: Bedan, Morgan (GOV)
Sent: Thursday, November 05, 2015 1:13 PM
To: Thelen, Mary Beth (DEQ)
Subject: RE: Water Update Today?

Hi, Mary Beth.
 Had some feedback from the Gov on the reports.

He asked that they include: key actions, positions, concerns, changes from previous report, and checklist on what is supposed to be done and when.

Thanks!

Thanks!

Rennaker, Joanne (DEQ)

From: Brent Wright <bwright@cityofflint.com>
Sent: Thursday, November 05, 2015 3:11 PM
To: Prysby, Mike (DEQ)
Cc: Michael Glasgow; Howard Croft (hcroft@cityofflint.com); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Natasha Henderson
Subject: Re: Installation of Corrosion Control Treatment

Mike,

We received the permit in the mail today. I will start placing orders for the equipment and the staff at the plant will start on the piping portion of the two systems on Monday.

Thank you

On Wed, Nov 4, 2015 at 1:13 PM, Brent Wright <bwright@cityofflint.com> wrote:
Mike,

We still have not received the permit from the DEQ. Do you know when it was mailed?

Brent

On Wed, Nov 4, 2015 at 12:55 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Michael,

Please notify our department regarding the anticipated timeframe to install the corrosion control treatment system at the water treatment plant. The timeframe should take into account estimated time to receive the chemical feed pumps, storage equipment, and the orthophosphate compound. Coordination of the contractor to install the equipment also needs to be included. If there any delays with the installation of the corrosion control treatment system, please notify us as soon as possible. Finally, please inform us when the corrosion control treatment system is installed. If this occurs by next Monday, I may take the opportunity to conduct an inspection prior to our 12pm meeting.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

--

Brent Wright
Water Plant Supervisor
City of Flint
4500 N. Dort Hwy.
Flint, MI. 48505
Ph: 810.787.6537 ext. 3510
Fx: 810.787.3710

--

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4500 N. Dort Hwy.
Flint, MI. 48505
Ph: 810.787.6537 ext. 3510
Fx: 810.787.3710

Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Thursday, November 05, 2015 1:39 PM
To: Prysby, Mike (DEQ)
Subject: Lead & Copper Sample Lines - FYI

Mike,

We had been FOIA'd for data on service lines in regards to 2015 official monitoring, as the service center dug through the data to respond to the FOIA, many of the addresses we used in our report do not contain the service line information and I am sure that a news article will be following. Just wanted to give you an FYI, and my response will be the same as when we talked a few months ago, in regards to having to make some assumptions due to the area the house was in, or based on Mr. Bincsik's account that the vast majority of the connections from the city main to the curb box are lead. I am just wondering if you or any staff will have any comments on my response?

Thanks,

--
Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

Rennaker, Joanne (DEQ)

From: Sygo, Jim (DEQ)
Sent: Wednesday, November 04, 2015 5:18 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ); Krisztian, George (DEQ)
Subject: FW: Transmittal of Final Report - High Lead at Three Residences in Flint, Michigan
Attachments: Transmittal of Final redacted Report to MDEQ.pdf

Release of the report from Del Toral. With redactions?

From: Hyde, Tinka [<mailto:hyde.tinka@epa.gov>]
Sent: Wednesday, November 04, 2015 4:06 PM
To: Sygo, Jim (DEQ); hcroft@cityofflint.gov
Cc: nhenderson@cityofflint.gov
Subject: Transmittal of Final Report - High Lead at Three Residences in Flint, Michigan

Please find attached the Final Report - High Lead at Three Residences in Flint, Michigan. The report has been redacted to remove personally identifiable and medical information. Please let me know if you have any questions.

Tinka G. Hyde
Water Division Director
USEPA W-15J
77 W. Jackson Blvd
Chicago, IL 60604

Office: 312-886-9296
Cell: 312-735-9428



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGIONAL ADMINISTRATOR
 77 WEST JACKSON BOULEVARD
 CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

MEMORANDUM

DATE: November 4, 2015

SUBJECT: Transmittal of Final Report - High Lead at Three Residences in Flint, Michigan

FROM: Tinka G. Hyde *Tinka G. Hyde*
 Water Division Director

TO: Jim Sygo
 Deputy Director
 Michigan Department of Environmental Quality

Howard Croft
 Director of Flint Public Works

Enclosed please find for your file a final redacted version of a report prepared by EPA Scientist, Miguel Del Toral, regarding lead in drinking water at three residences in Flint, Michigan. The redactions remove personally identifiable and medical information. This report has been finalized and is also being provided to the National Drinking Water Advisory Council (NDWAC) for discussion during their upcoming meeting on November 17-19, 2015. We understand you saw an earlier version of this document; and note that most of the recommendations in that interim report are already being implemented (e.g., the City of Flint has switched back to Detroit water; filters have been provided to residents; and additional corrosion control treatment will be implemented).

The final report contains important new information indicating that physical disturbances of lead service lines can dislodge the protective coating that prevents lead from leaching into drinking water. The final report recommends notifying residents about the potential risks of increased lead levels in drinking water when work is undertaken that may disturb lead service lines.

cc: Natasha L. Henderson, City of Flint Administrator

High Lead Levels in Flint, Michigan

The purpose of this report is to present the findings of activities conducted in response to high lead levels in drinking water reported to the United States Environmental Protection Agency Region 5 Office (EPA) by a resident in the City of Flint, Michigan.

Background Information

Prior to April 30, 2014, the City of Flint purchased water from the City of Detroit. On April 30, 2014, the City of Flint switched from utilizing purchased water from Detroit to a new water source, the Flint River. Subsequent to the change in source water, the City of Flint experienced a number of water quality issues resulting in violations of National Primary Drinking Water Regulations (NPDWR) including acute and non-acute Coliform Maximum Contaminant Level (MCL) violations and Total Trihalomethanes (TTHM) MCL violations (see Appendix A).

Beginning in January 2015, [REDACTED], a resident of Flint, called the Flint Water Department (FWD) regarding the water quality in her home. In response to the initial and subsequent calls, the FWD visited the [REDACTED] home on a number of occasions and also collected tap water samples. [REDACTED] also contacted EPA regarding these same water quality issues and medical issues she believes are associated with the water quality in Flint.

Following initial calls on the general water quality, on February 26, 2015, [REDACTED] contacted EPA regarding high lead levels found in her drinking water by the City of Flint. The result of the initial lead in water sample collected by the City of Flint on February 18, 2015 from the [REDACTED] home was 104 µg/L and the level of iron in the water exceeded the capability of the instrument to measure (>3.3 mg/L). On February 26, 2015, upon receiving the lead results from [REDACTED], the EPA contacted the Michigan Department of Environmental Quality (MDEQ) regarding the high lead result. The MDEQ advised that the City of Flint collect a follow-up sample for lead at the [REDACTED] home.

On March 3, 2015, the City of Flint collected a follow-up sample for lead at the [REDACTED] residence and the result of this second sample was 397 µg/L¹. Subsequent to receiving her second result, EPA spoke to [REDACTED] via phone on March 19, 2015, and the following information was provided by [REDACTED]:

- The [REDACTED] home is a HUD home which was gutted and renovated in 2011. All existing plumbing had been removed and the [REDACTED] installed plastic plumbing.
- Due to high iron levels in the tap water, the [REDACTED] installed an iron filter downstream of the service line inlet into the home.
- [REDACTED] indicated that at this time they are not drinking the water or using it for cooking. She stated that her child's blood lead level (BLL) was originally at [REDACTED] in 2012 and that a more recent test showed it had increased to [REDACTED], but she noted that

¹ Note: A third water sample had been collected on April 2, 2015, but the results had not been provided to the [REDACTED] at the time the interim report was written. The third lead in water sample result was 707 µg/L.

Final Report, October 21, 2015

the BLL testing was done well after the child had stopped drinking the water and may have been higher during the time the child was consuming the water.

- Water samples collected by the City of Flint from her home were collected from the kitchen tap after the iron filter was physically removed.
- The Flint Water Department (FWD) informed [REDACTED] that her service line does not connect to the water main in front of her home as is typically the case for most homes.
- On March 18, 2015, City of Flint personnel went to the [REDACTED] home to locate the external shut-off valve in conjunction with the planned replacement of the [REDACTED] service line and were unsuccessful. Eventually it was discovered that the external shut-off valve was located at the corner of [REDACTED] and Bryant Street, two houses down from the [REDACTED] home.

As part of EPA's effort to respond to [REDACTED] concerns regarding her water results, EPA contacted the FWD. The following information was provided to EPA by the FWD:

- [REDACTED] home is one of the first homes built on the block and the service line runs for approximately 50-60 yards, connecting to the water main on Bryant Street which runs perpendicular to [REDACTED] (see Appendix A).
- Flint has a large number of lead service lines, so it would not be surprising to find that this is a very long lead line.
- The first sample from the [REDACTED] home was collected with the iron filter in place, and the second was with the iron filter physically removed. The iron filter was located just after the water meter.
- [REDACTED] showed FWD a video of her son 10 minutes after taking a bath, and that he had a full body rash in the video.

It was a common practice in the early 1900s to purchase large parcels of land and later subdivide them. Since service lines are typically run from the water main to the nearest location on a property and it is possible that the [REDACTED] home may have originally been part of a larger parcel of land that encompassed the two homes that now exist adjacent to the [REDACTED] home and was subsequently divided, leaving the original home connected to the same service connection and water main, while the newer homes were connected to a more recent water main installed along [REDACTED].

Based on a suspected conflict of interest at the healthcare facility that originally tested her son's BLL, [REDACTED] took her son to a different healthcare facility to have his blood lead tested again. On April 1, 2015, [REDACTED] provided EPA with a copy of her child's blood lead testing performed on March 27, 2015, showing a higher BLL ([REDACTED]) than the original test.

Due to the persistently high lead results, the FWD shut off the water service to the [REDACTED] home on April 3, 2015. Per agreement between the FWD and [REDACTED], her home was then connected to her neighbor's home via a garden hose, from one hose bib to another. This was understood to be a temporary measure until the [REDACTED] service line could be replaced. The [REDACTED] used this water connection only for bathing, washing dishes and washing clothes.

At the invitation of [REDACTED], EPA visited the [REDACTED] home on April 27, 2015, and reviewed the internal plumbing and information provided by [REDACTED], including water samples and spent filter cartridges. During this visit, EPA observed that the internal pipes, valves and connectors at the [REDACTED] residence were made of CPVC plastic, approved by NSF for potable drinking water applications, with a few minor metal connectors. A review of the treatment units in the home by EPA found that there was no iron filter in the home as had previously been thought. The only active treatment device in the home was a whole-home sediment filter which utilizes NSF certified Whirlpool WHKF-WHWC cartridge filters for sediment removal and taste/odor. There was also a non-functioning 'Water Resources International Hydro-Quad Commercial Water Processor' which was bypassed (see Appendix A).

At the request of [REDACTED], Dr. Marc Edwards at Virginia Tech provided sampling instructions to [REDACTED] for collecting a series of samples from her home. As part of the instructions, on the night of April 27, 2015, the water at the [REDACTED] residence was turned back on temporarily and the kitchen tap was flushed for 25 minutes at low flow prior to letting the water sit overnight. A series of sequential samples were collected the following morning (April 28, 2015) and sent to Dr. Edwards for analysis.

Dr. Edwards provided [REDACTED] with the results of the analyses and also shared the results with EPA on May 5, 2015, along with information regarding other chemical parameters tested (see Appendix B). In addition to very high lead levels in all sample results, the analytical data shows a correlation between lead and phosphate as well as lead and aluminum in all samples. On April 24, 2015, EPA had learned that Flint did not have corrosion control treatment in place and also learned that Flint was using ferric chloride as a coagulant. Consequently, as the City of Flint is not utilizing phosphate or alum as treatment chemicals since the source switch, the results indicate that it is likely that the phosphate and aluminum were being released from the scale within the distribution system network. This scale would have formed on the inside of the pipes in Flint during the time when the City was purchasing water from Detroit, as Detroit utilizes orthophosphate for corrosion control and alum as a coagulant in their water filtration process.

Research conducted by EPA on lead content in pipe scales has shown that scales which form on the inside of lead pipes can be released or dislodged into the water and may contain a high percentage of lead (Appendix C). Although the results received from Virginia Tech were indicative of the presence of a lead service line, the FWD indicated that no records existed to confirm whether any portion of the service line connecting to the [REDACTED] home was made of lead. However, given the high lead levels found, it was presumed that at least a portion of the service line was likely made of lead. In the course of following up on the high lead at the [REDACTED] home, additional sample results provided to EPA from other residences in Flint also showed high lead levels.

Primarily from a public health standpoint, but also from a research standpoint, it was important to try to find out what the cause of these very high lead levels might be. EPA Region 5, EPA's Office of Research and Development and others have been working

together collaboratively to better understand lead release mechanisms from lead service lines in anticipation of upcoming revisions to the Lead and Copper Rule (LCR) and as part of a collaborative effort in EPA Region 5 to study potential options for optimizing phosphate treatment to control lead in water and the need to reduce phosphorus discharges into the environment. Since the [REDACTED] service line was scheduled for replacement on May 6, 2015 and the presumption was that at least a portion of the service line was lead, EPA visited the [REDACTED] home on the day of the service line replacement to gather information and service line pipe samples that could provide additional information as to how lead levels could get as high as they did in this case.

The original service line to the [REDACTED] home was disconnected and two service line pipe segments from this service line were extracted on May 6, 2015. Additional tap water samples were collected also from two homes on Bryant Street that were connected to the same water main as the [REDACTED] home (Appendix A). The samples were collected from these homes as they had more typical service line lengths as compared with the [REDACTED] home. During the same visit, patches of asphalt were also noted along the curb on Browning Avenue, indicating that excavation had occurred. These patches, which were in proximity of the [REDACTED] service line in the parkway (see Appendix C) may be one of the potential factors contributing to the high lead at the [REDACTED] home, as it has been shown that physical disturbances to pipes can dislodge the scales within those pipes.

The two service line segments that were extracted were subsequently identified as galvanized iron pipe. Analyses conducted by Virginia Tech on the extracted portions of the pipe indicate that the galvanized iron pipe was fairly typical in terms of composition (see Appendix C). The galvanized iron portion ran from inside the [REDACTED] home to the external shut-off valve at the corner of [REDACTED] and Bryant Street. The remainder of the [REDACTED] original service line from the shut-off valve to the water was made of lead.

Although the service line had been disconnected from the [REDACTED] home, it was not possible to retrieve a segment of the lead portion of the service line as it was beyond the shut-off valve which had been closed and left in place. Following the disconnection of the original service line, a new service line made of copper was installed from the [REDACTED] home to the water main in front of the home on [REDACTED]. Subsequent to the replacement of the service line at the [REDACTED] home, water samples were also collected from the [REDACTED] home and sent to the EPA Chicago Regional Laboratory for analysis. In all three homes, the sequential samples were collected using standard protocols used in prior sequential sampling efforts to capture water samples reflecting lead levels from the kitchen tap to the water main. Two additional samples were collected from the water heater drain valve at the [REDACTED] home to determine if lead deposits had accumulated in the water heater, and a final sample was collected from the bathroom tap. The sequential sampling results indicate that the service line replacement eliminated the high lead levels and that no residual lead had accumulated within the plastic plumbing of the [REDACTED] residence, which was a potential concern and possibility based on prior research. One of the two samples collected from the [REDACTED] hot water heater had high lead (32 µg/L), likely from lead particulate that had accumulated in the tank, and the sample collected from the bathroom was 5.5 µg/L.

The sequential samples collected from the two homes on Bryant Street had differing results. At the first home (Site 2), a series of 15 sequential one-liter samples were collected and the results are indicative of a service line that does not contain any portion that is made of lead. Consequently the lead results were low overall for samples representative of the service line. The first sample in the sequential sampling series was the highest, which potentially indicates the presence of leaded brass in the faucet or underlying sink fixtures. Some leaded brasses manufactured prior to the 2011 lead-free law have been shown to release high levels of lead in certain water qualities. Leaded-solder was ruled out as the home plumbing consisted of galvanized iron pipe, and it is presumed that if the galvanized iron pipe were contributing the higher lead, the lead levels would be more consistent in all 15 samples.

At the second home (Site 3), a series of 15 sequential one-liter samples were collected from the kitchen tap and the results indicated that there were no significant sources of lead within the home plumbing but that a portion of the service line is likely made of lead, as indicated by the characteristic peaking of lead levels in the liters capturing water from the service line between the property and the water main, where the portions of many service lines in Flint are made of lead.

All three sets of sequential samples were analyzed for lead, copper, iron, phosphorus and cadmium. In contrast to the samples analyzed by Virginia Tech from the [REDACTED] home prior to the removal of the original service line, no phosphorus was present in the sequential samples at the [REDACTED] home following the replacement of the service line. In addition, no phosphorus was detected in the sequential samples from the two homes on Bryant Street. These results indicate that the source of high lead, aluminum and phosphorus in the analyses conducted by Virginia Tech was likely dislodged or disintegrated scale from within the [REDACTED] original service line.

The sequential sampling results from the [REDACTED] home before and after service line replacement, as well as the results from the two homes on Bryant Street are included in Appendix B.

Although relative contributions cannot be determined, there are a number of factors that could have contributed to the high lead levels found at the [REDACTED] home as follows:

1) Corrosiveness of water and lack of mitigating (corrosion control) treatment

The corrosiveness of the water and the absence of mitigative treatment to control lead release are well known factors that can contribute to high lead release.

2) Presence of a lead service line

Lead service lines are the largest source of lead, when present, and can contribute up to 75 percent of the total mass of lead released into the water. The portion of the original service line from the water main to the external shut-off valve at the corner of [REDACTED] and Bryant Street, estimated to be approximately 25 feet in length, was found to be a lead

pipe. In addition, studies have also shown that the scales within galvanized iron pipe downstream of lead pipe segments can be 'seeded' with lead from the lead portion of the service line. The [REDACTED] service line was much longer than most typical service lines which would allow accumulation of a greater total mass of scale within the pipe.

3) Physical disturbances

A recent EPA study indicates that physical disturbances in proximity to lead service lines can cause the dislodging of the protective scales from within the service lines. The photograph in Appendix C shows the scale that was dislodged from inside a lead service line during routine maintenance work in another city due to a physical disturbance of the line. The dislodged scale and sediment contained a very high concentration of lead. At the time of the EPA visit to the [REDACTED] home, there were two patches of new asphalt visible on [REDACTED] along the parkway where the [REDACTED] original service line was located, indicating recent excavation and possible recent physical disturbances to the [REDACTED] service line (Appendix C). These potential disturbances were along the galvanized iron section of the service line and as noted above, research has shown that the presence of lead pipe upstream can 'seed' the galvanized iron pipe downstream with lead, which results in an accumulation of lead-bearing scales within the galvanized pipe downstream of the lead portion of the service line. It is reasonable to assume that these physical disturbances to the galvanized iron portion of the service line could therefore result in the same dislodging of scale and sediment as studies have shown can happen with lead service lines.

The street disturbances on [REDACTED] occurred after the [REDACTED] moved into the home along the portion of the service line made of galvanized iron pipe. There were no visible signs of disturbance on Bryant Street where the lead portion of the [REDACTED] service line was situated (see Appendix C). It is likely, given the extremely high lead levels found and the co-occurrence of aluminum, phosphorus and lead, that the long segment of galvanized iron pipe was seeded with lead over the entire length of the pipe and the physical disturbances and other factors such as the water chemistry resulted in the release of large amounts of the high-lead bearing scale and sediment into the water. Virginia Tech also found nearly perfect correlations between the lead in water and markers for galvanized pipe scales including zinc.

Recommendations

As indicated by the results from the [REDACTED] home and previous EPA work, the presence of lead pipes over many years has likely resulted in the accumulation of lead in the scales within non-lead pipes downstream of the lead pipe and physical disturbances to the lead or non-leaded portions of the service lines have the potential to release large amounts of scale and sediment that could pose an immediate and acute health hazard to the residents. Consequently, even with corrosion control treatment in place in the future, physical disturbances will be capable of dislodging the high lead-bearing scale and sediment from non-lead pipes as well as lead pipes, as was the case in the earlier EPA study.

Obtaining information on the lead reservoirs in the scales within the lead and non-leaded portions of intact service lines is essential for determining the potential risk to residents

from lead-bearing scale released as lead lines are replaced as well as the risk that may remain following removal of the lead lines, where the non-leaded portions of service lines are left in place.

As the [REDACTED] service line was very long compared to the length of most typical service lines, it is important to assess the potential risk posed by the scale reservoirs in more typical lengths of service lines by extracting both the leaded and non-leaded portions of service lines which have not been physically disturbed. The service lines chosen for extraction and analysis should be representative of the materials commonly used downstream of the lead pipe (e.g., galvanized iron, copper, plastic). Extraction/handling procedures should be developed by EPA to ensure that damage to the scales from the excavation, extraction and delivery of the service line segments is minimized. Sequential sampling should also be conducted on a representative group of homes with common plumbing materials (e.g., galvanized iron, copper, plastic) to determine the extent to which the lead from the service line has seeded the interior plumbing in homes.

It is also critically important to develop and incorporate ongoing training and public education on the potential for high lead release from the scales as a result of any future physical disturbances to service lines and mitigative actions that residents can take to lower their exposure risk. The training and educational material should be assessed for clarity, meaningfulness, and accessibility by a group of residents and health experts to ensure the effectiveness of the communications.

At a minimum, immediate training and public education on the potential risks posed by physical disturbances to service lines should be developed by communications experts and provided to residents, community groups, elected officials, health departments, pediatricians and gynecologists, water and non-water utilities (gas, electric, cable, etc.), plumbing organizations and contractors. Residents should be notified of scheduled work by water and non-water utilities and informed of the potential risk of increased lead levels due to these disturbances.

Appendix A – Background Information

National Primary Drinking Water Regulations (NPDWR) Violations – City of Flint

Following the switch to the Flint River, the City of Flint experienced a series of NPDWR violations as follows:

- Acute Coliform MCL violation in August 2014
- Monthly Coliform MCL violation in August 2014
- Monthly Coliform MCL violation in September 2014
- Average TTHM MCL violation in December 2014
- Average TTHM MCL violation in March 2015
- Average TTHM MCL violation in June 2015

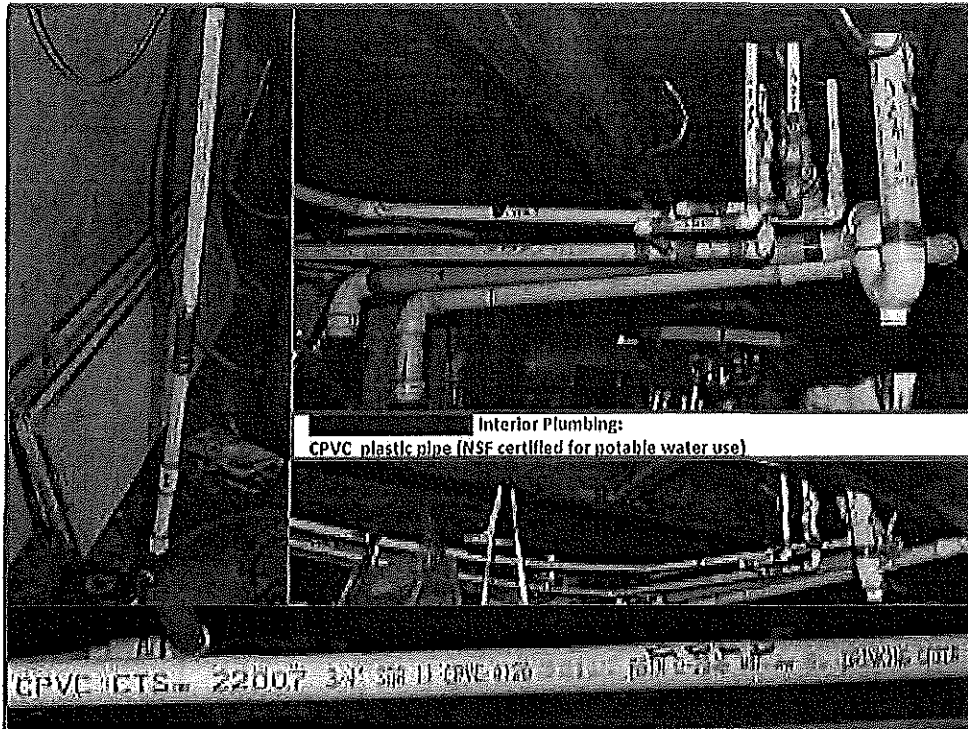
Sampling Sites

The map below shows the three homes that were sampled as provides information on the length of the service lines and the plumbing material. Two portions of the original service line were extracted and analyzed and a third portion was collected from the entry point into the home, but not analyzed.

[map redacted because it shows Personally Identifiable Information]

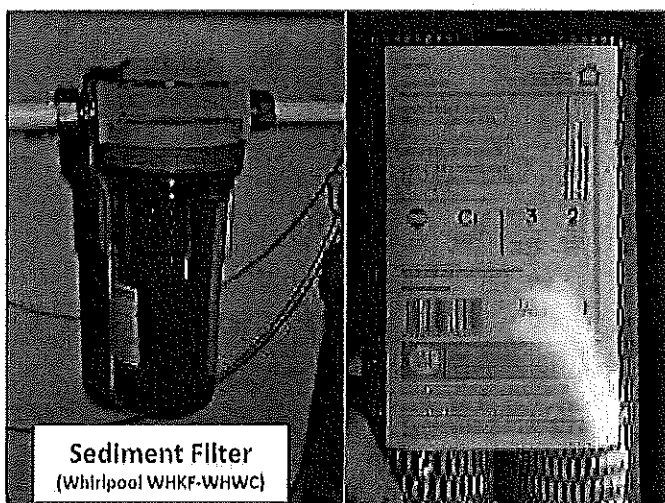
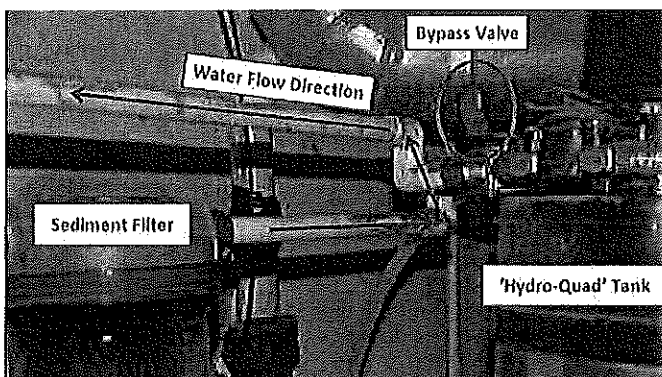
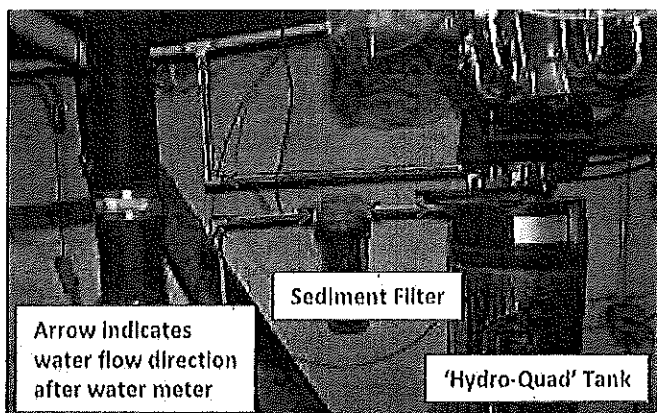
Internal Plumbing – [REDACTED]

The following pictures were taken at the [REDACTED] home located at [REDACTED]. With the exception of a few minor metallic connectors, all potable water plumbing in the home was found to be CPVC plastic pipe which is NSF-certified for drinking water use.



*Final Report, October 21, 2015***Treatment Units –** [REDACTED]

The [REDACTED] home has a whole-home sediment filter, as well a non-functioning 'Hydro-Quad Commercial Water Processor' which is bypassed. There was no iron filter in the home as had been previously reported.



Appendix B – Analytical Results

Lead in water sampling results from the [REDACTED] residence ([REDACTED])

City of Flint Samples

The City of Flint collected water samples from the [REDACTED] residence and analyzed them for lead. The results for each date are listed below.

February 18, 2015: 104 µg/L

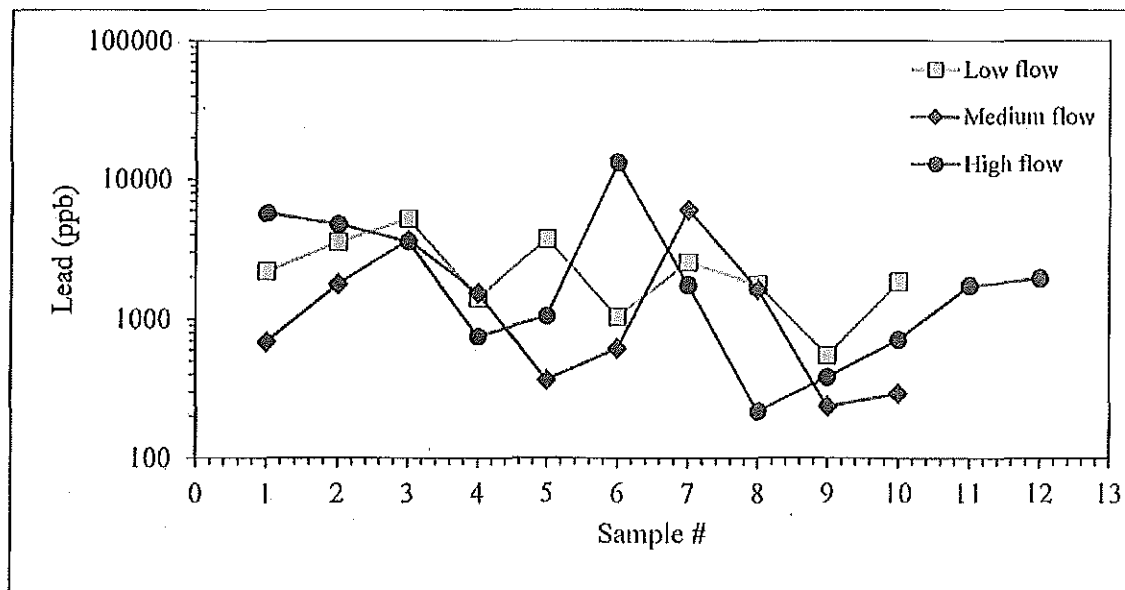
March 3, 2015: 397 µg/L

April 2, 2015: 707 µg/L*

*This sample result had not been provided to the [REDACTED] at the time the interim report was written.

Virginia Tech Sampling Results (provided courtesy of Virginia Tech)

Samples were collected from the [REDACTED] home following an extended stagnation period (April 3, 2015 to April 27, 2014) after the water at the [REDACTED] residence had been shut off. The water was turned back on and three sets of sequential samples were collected on April 28, 2015, at different flow rates (low, medium and high).



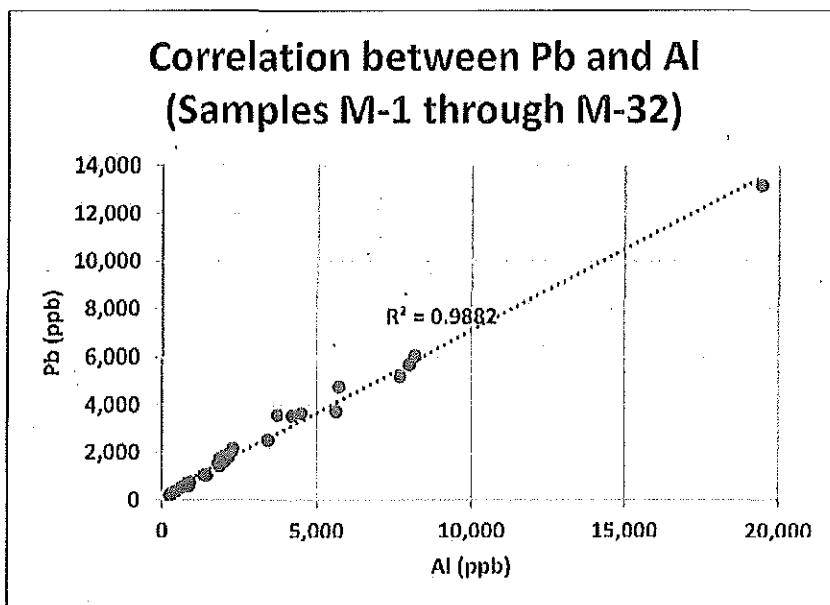
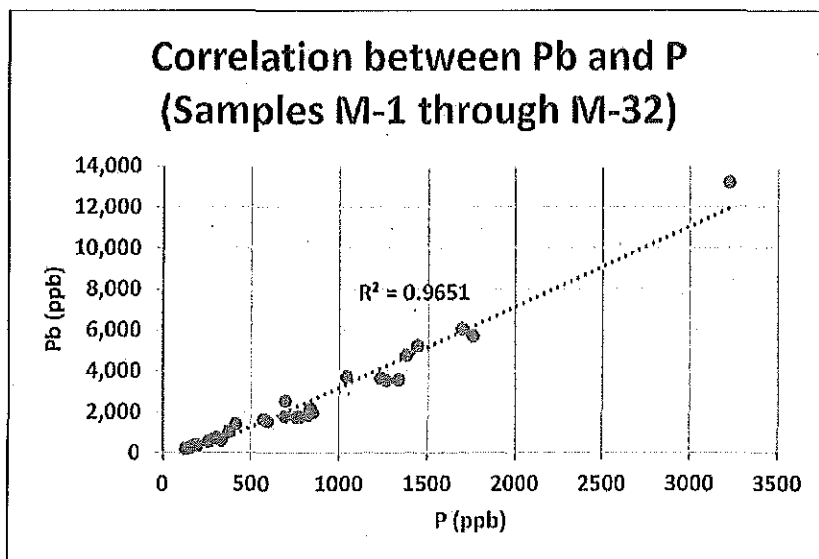
Element (units)	Low Flow									
	1 L Sample Bottle							125 mL Sample Bottle		
	M-1	M-2	M-3	M-4	M-5	M-6	M-7	M-21	M-22	M-23
Ag (ppb)	0	0	0	0	0	0	0	0	0	0
Al (ppb)	2,285	4,199	7,683	1,856	5,623	1,422	3,413	1,865	666	2,015
As (ppb)	3.3	3.9	4	2	3.2	2	2.6	3.6	1.9	3.1
Ba (ppb)	31.3	39.8	27.7	21.2	24.2	20.9	22.8	31.3	21.3	32.6
Ca (ppb)	43,150	43,620	43,580	42,590	43,030	42,030	42,440	40,790	41,050	41,460
Cd (ppb)	2.5	4.2	5.7	1.9	3.9	2	2.5	2.2	1.4	2.4
Cl (ppm)	1,206	1,148	1,272	1,178	1,187	1,214	1,218	1,641	1,076	1,044
Co (ppb)	1.1	1.7	0.9	0.4	0.7	0.4	0.5	0.9	0.3	1
Cr (ppb)	2.1	2.5	2.6	1.3	1.9	1.6	1.5	1.8	1.3	1.7
Cu (ppb)	235	355	294	94	146	101	112	180	82	178
Fe (ppb)	3,598	4,928	3,419	1,446	3,029	2,142	1,780	3,096	1,344	3,241
K (ppb)	3,480	3,508	3,445	3,435	3,430	3,391	3,409	3,256	3,319	3,341
Mg (ppb)	10,310	11,910	17,990	11,290	15,470	10,610	12,720	8,861	9,396	9,098
Mn (ppb)	1,734	2,790	1,093	462	703	429	652	1,382	442	1,509
Mo (ppb)	2.3	2.3	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.8
Na (ppb)	17,790	17,860	17,810	17,620	17,650	17,410	17,610	16,960	17,100	17,280
Ni (ppb)	9.8	16	30.7	8.1	23.2	6.2	15.3	6.6	3.7	6.8
P (ppb)	835	1,267	1,441	416	1,040	379	691	773	261	819
Pb (ppb)	2,171	3,550	5,224	1,412	3,735	1,038	2,542	1,759	552	1,857
S (ppm)	28.5	28.7	28.5	28.4	28.5	28	28	26	27	27.1
Se (ppb)	0.2	0	-0.1	0.1	0.2	0	0.3	0	0	0.2
Si (ppb)	3,212	5,281	12,320	4,474	9,401	3,770	6,231	2,619	2,582	2,775
Sn (ppb)	4.6	4.9	6.1	2.2	4.5	2.3	3	2.3	1.5	2.3
Sr (ppb)	129.4	132.3	128.5	125	127.7	125.3	126.1	126.3	125.5	128
Tl (ppb)	3.4	5.8	8.3	2.1	5.8	1.9	3.1	3	1.4	3.1
U (ppb)	1	1.6	2.6	0.8	1.9	0.7	1.2	0.9	0.4	0.9
V (ppb)	13.9	17.5	23.9	9.8	17.6	8.9	13.8	12.2	6	10.8
Zn (ppb)	1,055	1,848	2,731	777	1,890	839	979	746	513	808

Element (units)	Medium Flow									
	1 L Sample Bottle							125 mL Sample Bottle		
	M-8	M-9	M-10	M-11	M-12	M-13	M-14	M-24	M-25	M-26
Ag (ppb)	0	0	0	0	0	0	0	0	0	0
Al (ppb)	891	2,142	4,493	1,810	431	877	8,159	2,005	286	347
As (ppb)	2.2	2.9	3.9	2.5	2	2.3	4.6	2.7	1.8	2
Ba (ppb)	22	29.1	36.3	28	18.9	22.6	37.1	26.2	18.9	19.4
Ca (ppb)	41,520	41,580	42,080	41,490	41,020	40,850	42,010	40,940	41,110	40,550
Cd (ppb)	1.5	2.4	4	2.1	1	1.5	4.9	2.9	0.9	1
Cl (ppm)	1,329	1,211	1,252	1,225	1,507	1,321	1,324	1,179	1,258	1,318
Co (ppb)	0.4	0.8	1.3	0.7	0.2	0.4	1.4	0.7	0.2	0.2
Cr (ppb)	1.1	1.5	2.2	1.4	1.2	1.1	3.5	2.1	1.1	1.1
Cu (ppb)	104	151	257	144	65	119	267	166	52	59
Fe (ppb)	1,510	2,476	4,254	2,258	912	1,471	4,563	3,450	711	820
K (ppb)	3,363	3,391	3,370	3,352	3,344	3,311	3,360	3,308	3,356	3,311
Mg (ppb)	9,769	9,960	12,360	9,703	9,331	9,513	16,430	10,820	9,237	9,166
Mn (ppb)	498	1,185	1,878	1,052	231	536	1,947	967	167	220
Mo (ppb)	1.8	1.8	1.8	1.9	1.8	1.8	2.2	2	1.7	1.7
Na (ppb)	17,240	17,370	17,370	17,310	17,190	17,010	17,320	17,020	17,140	16,950
Ni (ppb)	4.1	7.7	16.2	6.8	2.7	3.8	33	7.7	2.1	2.4
P (ppb)	321	690	1,233	595	178	332	1,697	573	144	163
Pb (ppb)	688	1,791	3,655	1,549	366	616	6,048	1,631	237	292
S (ppm)	27.6	27.5	27.3	27.3	27.1	26.9	27	26.4	27	26.6
Se (ppb)	0	0	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0
Si (ppb)	2,892	3,591	6,180	3,307	2,445	2,756	11,280	4,184	2,274	2,303
Sn (ppb)	2.2	2.6	4.4	2.5	1.4	1.8	4.9	3	1	1.1
Sr (ppb)	124	128	128	126	124	124	128	126	125	124
Ti (ppb)	1.6	2.9	5.5	2.5	1	1.2	7.7	2.7	0.4	0.6
U (ppb)	0.5	0.9	1.7	0.9	0.4	0.5	2.7	0.9	0.3	0.3
V (ppb)	8.4	11.9	17.5	10.4	8.2	8.4	25.1	9.7	6	7.4
Zn (ppb)	657	933	1,669	836	366	592	1,934	1,304	305	337

Element (units)	High Flow											
	1 L Sample Bottle						125 mL Sample Bottle					
	M-15	M-16	M-17	M-18	M-19	M-20	M-27	M-28	M-29	M-30	M-31	M-32
Ag (ppb)	0	0	0	0	0	0	0	0	0	0	0	0
Al (ppb)	7,984	5,713	3,714	912	1,354	19,440	1,893	248	455	822	1,859	2,176
As (ppb)	5	4.1	4.3	1.9	2.1	7.4	2.9	2	2.2	2.3	3.2	3.4
Ba (ppb)	40	37	45	21	22	41	32	19	20	22	31	34
Ca (ppb)	42,200	41,870	41,760	41,120	41,110	43,860	41,410	40,730	40,990	40,550	41,000	41,050
Cd (ppb)	5.6	4.1	3.7	1.4	1.9	9.3	2.2	0.9	1.2	1.6	2.1	2.5
Cl (ppm)	1,347	1,261	1,088	1,150	1,138	1,285	891	1,261	1,309	1,215	1,121	1,226
Co (ppb)	1.6	1.4	1.7	0.4	0.4	1.9	0.9	0.2	0.3	0.4	0.9	1
Cr (ppb)	2.8	2.4	2.6	1.3	1.3	4.8	1.7	1.1	1.5	1.5	1.6	1.8
Cu (ppb)	541	24	276	89	105	351	165	52	70	96	167	192
Fe (ppb)	4,926	4,288	5,323	1,509	1,705	6,491	3,074	667	1,215	1,591	3,026	3,349
K (ppb)	3,363	3,350	3,343	3,327	3,305	3,410	3,361	3,320	3,348	3,287	3,333	3,331
Mg (ppb)	15,910	13,430	9,758	9,633	10,240	29,890	9,110	9,158	9,305	9,462	9,051	9,157
Mn (ppb)	2,067	2,058	2,818	498	503	1,975	1,401	149	301	534	1,369	1,638
Mo (ppb)	2	2	2	1.9	1.9	2.2	1.8	1.8	1.8	1.8	1.8	1.8
Na (ppb)	17,340	17,310	17,280	17,110	16,980	17,540	17,370	17,040	17,210	16,840	17,250	17,230
Ni (ppb)	30.6	21.7	11.8	4.6	5.8	80	7.5	3	2.8	3.9	6.3	7.2
P (ppb)	1,758	1,378	1,336	308	378	3,224	771	134	199	299	756	847
Pb (ppb)	5,702	4,781	3,585	755	1,055	13,200	1,752	217	384	715	1,742	1,962
S (ppm)	27.2	26.9	26.8	26.7	26.6	27.1	27	26.6	26.9	26.2	26.8	26.4
Se (ppb)	0.2	0.2	0.2	0	0	0.1	0	0.2	0.1	0.2	0.1	0.1
Si (ppb)	10,530	7,660	3,636	2,830	3,573	26,740	2,680	2,258	2,422	2,687	2,661	2,826
Sn (ppb)	5.6	4.2	3.8	1.8	2	8.9	2.2	1	1.3	1.6	2.2	2.5
Sr (ppb)	129	128	129	125	125	131	128	125	125	125	127	127
Ti (ppb)	8.2	6.1	6.2	1.1	2.2	16.9	3.7	0.5	0.8	1.3	3	3.1
U (ppb)	2.7	2	1.6	0.5	0.6	5.6	0.9	0.3	0.4	0.5	0.9	1
V (ppb)	24.3	19.8	16.3	6.8	8.3	51.3	10.2	6.5	7.8	8	10.9	11.7
Zn (ppb)	2,520	1,622	1,305	593	796	3,652	752	293	395	603	739	856

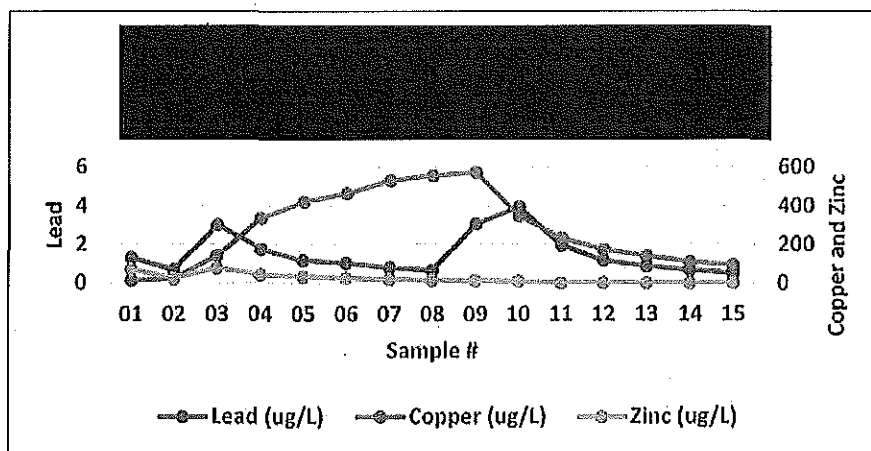
Correlation between lead, phosphorus and aluminum

The correlation of lead and phosphate, as well as lead and aluminum, indicate that the samples were captured scale and sediment that had formed inside the pipes while the City of Flint was purchasing water from Detroit. The absence of these chemicals in the current treatment provided by Flint indicate that these elements were not in the water passing through the pipes, but came from the scales inside the service line which had disintegrated into the water or were dislodged into the water.



U.S. EPA Region 5 sampling**█ residence (following replacement of service line)**

Following the replacement of the █ original service line, a series of 15 sequential samples were collected from the kitchen tap to measure the lead levels and other parameters to ensure that the high lead from the original service line had not contaminated the interior plumbing at the █ home. With the exception of two areas, lead levels were low throughout the █ plumbing following the service line replacement. The two sources of lead that were still detected in the plumbing are likely the water meter (Sample 3) and the new external service shut-off valve (Samples 9-11). Although new brass plumbing components must be lead-free, there can still be some lead that is released from these components.

**█ (█ home)****After Service Line Replacement**

Sample #	Site Description	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	Kitchen	13.1	1.3	70.9	U	0.171	U
02	Kitchen	20.1	0.687	23.2	U	0.117	U
03	Kitchen	141	3.01	76.8	U	0.144	U
04	Kitchen	336	1.76	45.4	U	0.151	U
05	Kitchen	419	1.17	32.2	U	0.149	U
06	Kitchen	463	1.03	24.8	U	0.149	U
07	Kitchen	529	0.8	19.6	U	0.146	U
08	Kitchen	554	0.666	14.9	U	0.147	U
09	Kitchen	571	3.07	11.6	U	0.195	U
10	Kitchen	345	3.93	10.3	U	0.282	U
11	Kitchen	233	1.94	0	U	0.283	U

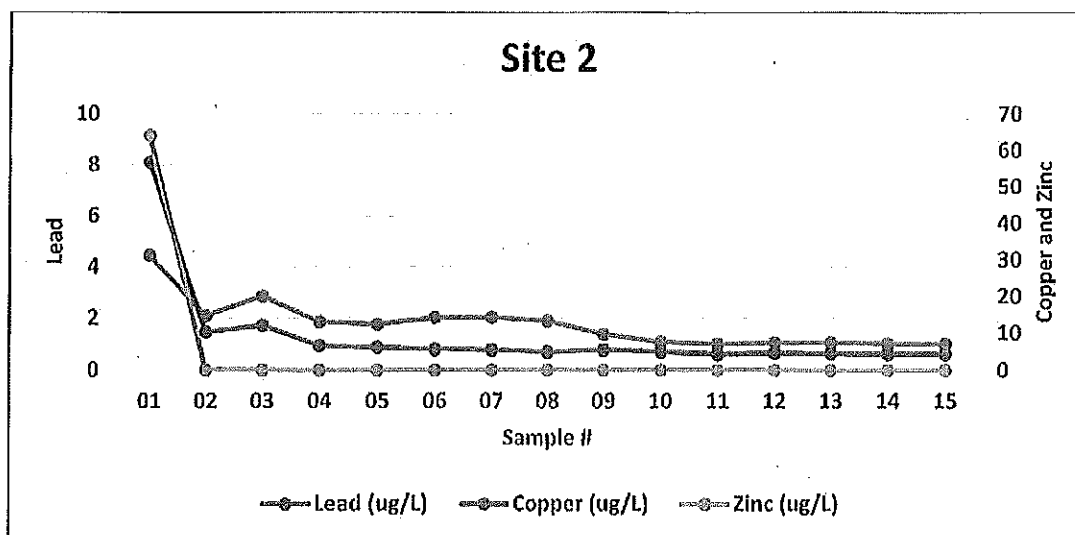
██████████ (██████████ home)

After Service Line Replacement

Sample #	Site Description	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
12	Kitchen	171	1.17	0	U	0.290	U
13	Kitchen	139	0.864	0	U	0.292	U
14	Kitchen	110	0.67	0	U	0.294	U
15	Kitchen	91.5	0.505	0	U	0.297	U
16	Bathroom	29.7	5.52	71.3	U	0.259	U
17	Water Heater	70.4	31.7	883	U	0.540	0.0877
18	Water Heater	35	9.74	346	U	0.0870	U

Site #2 (Bryant Street)

Based on the results found at this home, it does not appear that any portion of the service line is made of lead, and as a result, the lead levels are low in most samples. The exception is in Sample 1 which reflects water within approximately 15 feet of the kitchen tap and is likely due to brass components in the faucet, underlying valves and fixtures.



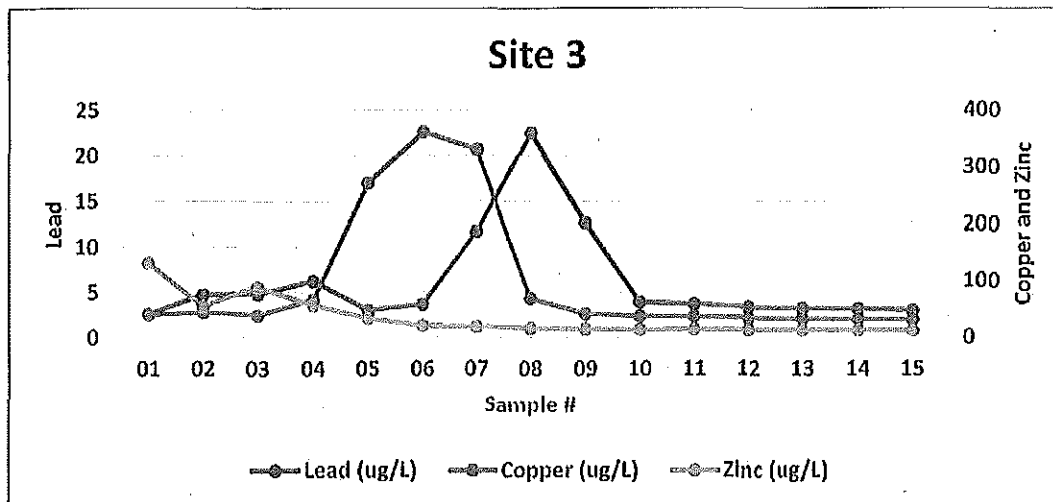
Site 2

(Note: U for Zinc replaced with 0 to show on graph)

Sample #	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	31.1	8.11	64	U	0.0307	U
02	14.7	1.46	U	U	0.0302	U
03	20	1.72	U	U	0.0302	U
04	13	0.933	U	U	0.0301	U
05	12.3	0.862	U	U	0.0311	U
06	14.2	0.795	U	U	0.0298	U
07	14.2	0.769	U	U	0.0311	U
08	13.3	0.691	U	U	0.0317	U
09	9.6	0.774	U	U	0.0319	U
10	7.57	0.715	U	U	0.0313	U
11	7.04	0.611	U	U	0.0301	U
12	7.3	0.655	U	U	0.0336	U
13	7.37	0.644	U	U	0.0308	U
14	7.09	0.631	U	U	0.0313	U
15	7.05	0.621	U	U	0.0300	U

Site #3 (Bryant Street)

Based on the results found at this home, it appears that the portion of the service line from the external service shut-off valve to the water main is made of lead as indicated by the increase in lead levels in samples 7 through 9.



Site 3

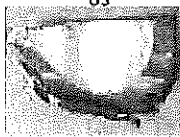
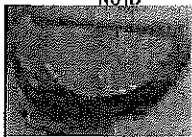
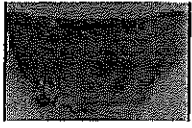
Sample #	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	40.7	2.63	132	U	0.0622	U
02	44.4	4.77	55.3	U	0.249	U
03	39.3	4.79	88.8	U	0.179	U
04	66.8	6.26	57.2	U	0.346	U
05	272	3.07	34.2	U	0.105	U
06	362	3.7	21.4	U	0.0598	U
07	331	11.7	19.5	U	0.0512	U
08	69.9	22.5	16.6	U	0.0399	U
09	42.5	12.7	15.1	U	0.0480	U
10	38.4	3.94	14.4	U	0.0489	U
11	37.5	3.72	14.5	U	0.0492	U
12	34.8	3.39	13.6	U	0.0481	U
13	33.1	3.23	13.1	U	0.0484	U
14	32.8	3.2	13	U	0.0480	U
15	31.4	3	12.3	U	0.0490	U

Analysis of [REDACTED] original service line pipe (galvanized iron portions)

Lead can also be found in galvanized pipe coatings as a contaminant in the zinc that is used to coat the surface of iron pipe in the galvanizing process. As such, two sections of the [REDACTED] original service line were analyzed for lead content.

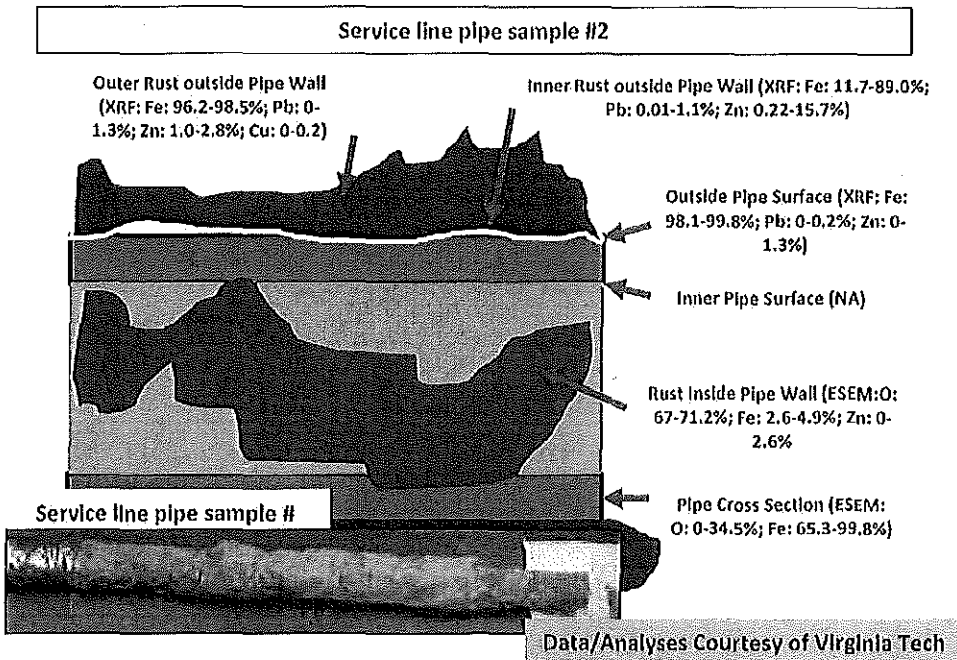
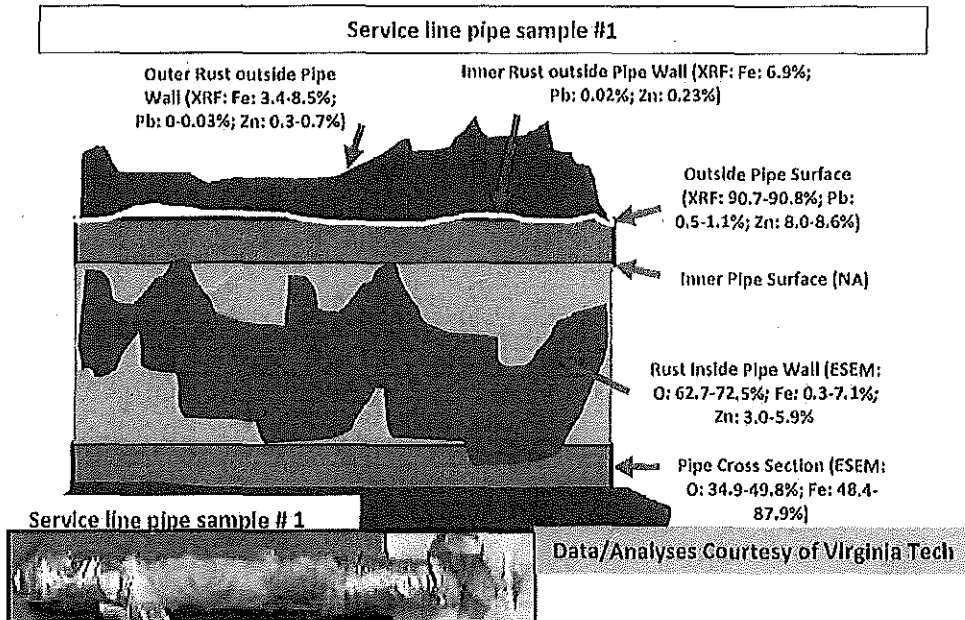
The images and data presented below are for a typical range of galvanized iron pipe.

Lead Content of Galvanized Iron Pipe - Examples

China	Turkey	US	No ID
			
Inside: Fe: 16.8-94.3%, Zn: 0.1-83.7%, Pb: 0-0.7%	Inside: Fe: 13.1-26.8%, Zn: 71.3-85.9%, Pb: 0.4-0.9%	Inside: Fe: 0.9-37.4%, Zn: 61.3-96.8%, Pb: ND	Inside: Fe: 3.9-69.1%, Zn: 29.3-93.1%, Pb: 0-1.3%
			
Outside: Fe: 4.6-12.6%, Zn: 81.5-94.1%, Pb: 1.0-1.1%	Outside: Fe: 37.6-57.1%, Zn: 41.6-60.1%, Pb: 0.8-1.0%	Outside: Fe: 1.8-14.9%, Zn: 19-98.1%, Pb: ND	Outside: Fe: 7.2-13.0%, Zn: 86.2-91.7%, Pb: 0.5-0.8%

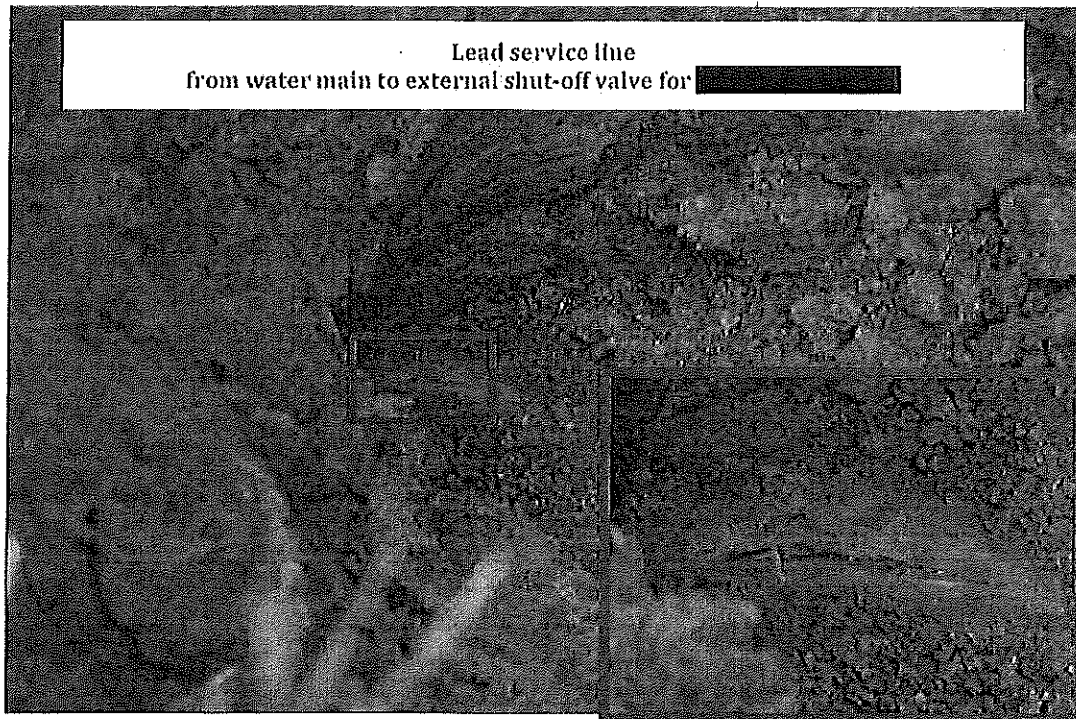
Data/Analyses Courtesy of Virginia Tech

Below are the results of the galvanized pipe analyses conducted by Virginia Tech on the two sections of galvanized iron pipe from the [REDACTED] original service line. The analyses indicate that the [REDACTED] original service line was a typical galvanized iron pipe.



Lead portion of the [REDACTED] original service line

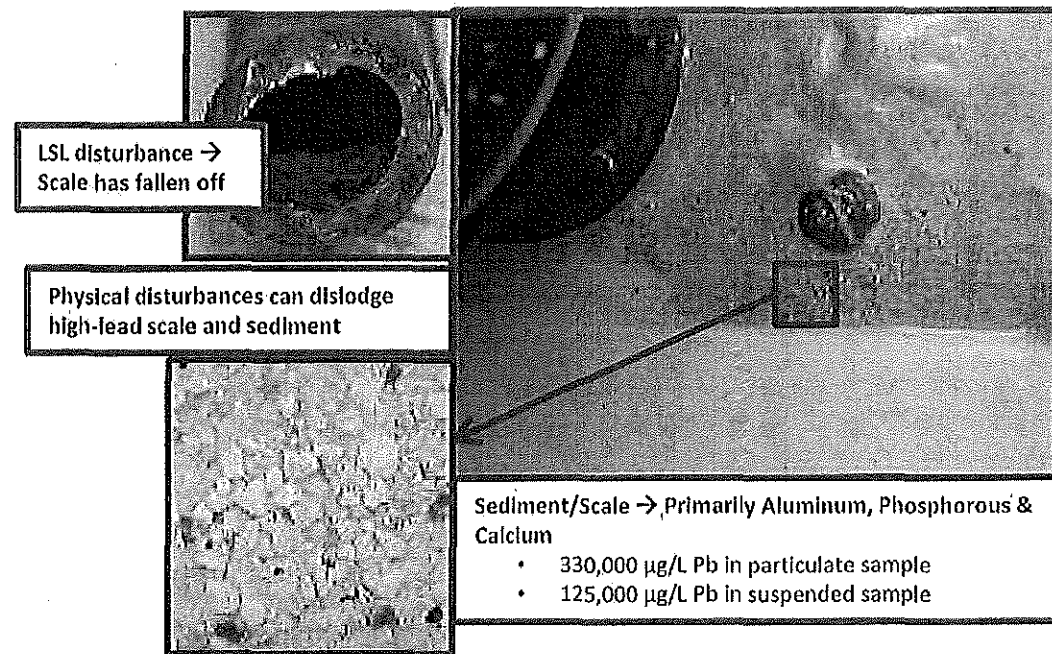
Lead service lines can contribute up to 75 percent of the total mass release into the water. The portion of the [REDACTED] original service line from the water main to the external shut-off valve at the corner of [REDACTED] and Bryant Street is made of lead and is estimated to be approximately 25 feet in length.



Appendix C – Additional Information

Physical disturbance of lead service lines

A recent EPA study indicates that physical disturbances to lead service lines or in proximity to lead service lines can cause the dislodging of the protective scales from within the lines. The photograph below shows the scale that was dislodged from inside a lead service line during routine maintenance work in another city due to a physical disturbance of the line. The dislodged scale and sediment contained a very high concentration of lead.



Lead service line disturbances were found to be a common factor for the majority of sites with high lead levels. It is also possible that low water usage may play a role in sites with the highest lead levels.

Lead service line scale analyses conducted by EPA's Office of Research and Development or obtained from peer-reviewed published literature from cities across the U.S. and in Canada (summarized below) show that scales within lead service lines can contain very high concentrations of lead. The yellow highlighted column in the table below shows the percentage of lead that has been found within different scales inside of lead service lines.

Lead & Element Percentages in Important Corrosion Byproduct Solids							
Mineral Name	Formula	% Pb	% C	% O	% S	% P	% Cl
litharge, massicot	PbO	97.80	0.00	7.20	0.00	0.00	
plattnerite, scrutinyite	PbO ₂	86.60	0.00	13.40	0.00	0.00	
Cerussite	PbCO ₃	77.50	4.50	18.00	0.00	0.00	
Hydrocerussite	Pb ₃ (CO ₃) ₂ (OH) ₂	80.10	3.10	16.50	0.00	0.00	0.00
Plumbonacrite	Pb ₁₀ (CO ₃) ₆ (OH) ₆ O	81.30	2.80	15.70	0.00	0.00	0.00
Anglesite	PbSO ₄	68.30	0.00	21.10	10.60	0.00	0.00

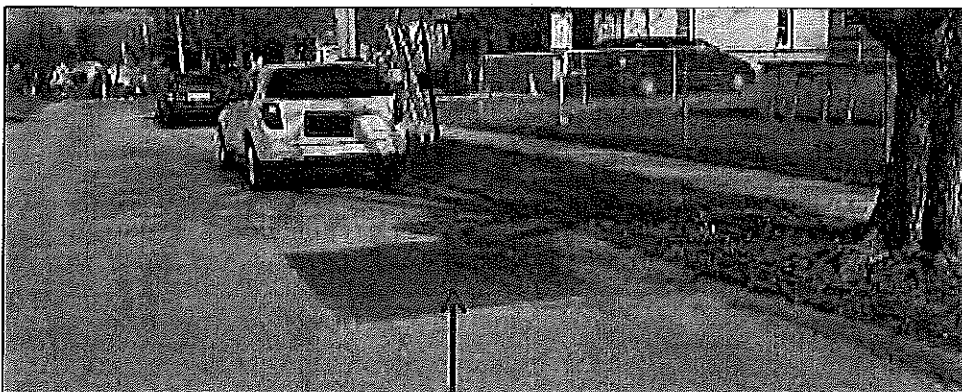
Lead & Element Percentages in Important Corrosion Byproduct Solids							
Mineral Name	Formula	% Pb	%C	%O	%S	% P	%Cl
Leadhillite, Susannite, MacPhersonite	$Pb_4(SO_4)(CO_3)_3(OH)_2$	76.80	2.20	17.80	3.00	0.00	0.00
Hydroxypyromorphite	$Pb_5(PO_4)_3OH$	77.43	0.00	15.55	0.00	6.95	0.00
Chloropyromorphite	$Pb_5(PO_4)_3Cl$	76.38	0.00	14.15	0.00	6.85	2.61
Tertiary Lead Orthophosphate	$Pb_3(PO_4)_2$	76.60	0.00	15.80	0.00	7.60	0.00
Lead(II) orthophosphate	$Pb_2(PO_4)_2$	76.60	0.00	15.80	0.00	7.60	0.00

While visiting the [REDACTED] home, two fresh patches of asphalt were seen along the parkway where the [REDACTED] original service line was located. The jarring and vibration associated with excavation can dislodge the high lead-bearing scales from within the service line pipes.



Recent patch (#1) of asphalt along curb next to the parkway where the [REDACTED] service line runs.

Photograph taken by U.S. EPA on April 27, 2015



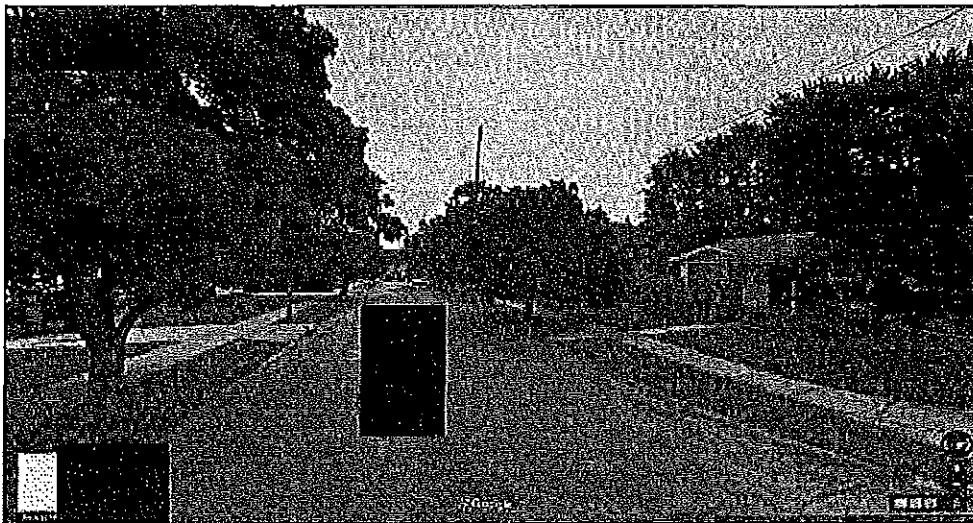
Recent patch (#2) of asphalt along curb next to the parkway where the [REDACTED] service line runs.

Photograph taken by U.S. EPA on April 27, 2015



July 2011 image [REDACTED] (view from [REDACTED] toward Bryant Street).

Google 'Street View' Image 1 captured in July 2011 shows no patches in street along curb next to the parkway where the [REDACTED] service line runs toward Bryant Street, indicating that the physical disturbances occurred after the date this image was captured (July 2011).



July 2011 image of [REDACTED] (view from Bryant Street toward [REDACTED]).

Google 'Street View' Image 2 captured in July 2011 shows no patches in street along curb next to the parkway where the [REDACTED] service line runs toward Bryant Street, indicating that the physical disturbances occurred after the date this image was captured (July 2011).



Corner of [REDACTED] and Bryant Street (location of [REDACTED] original external shut-off valve).

Photograph taken by EPA on April 27, 2015 shows no visible signs of physical disturbances in the vicinity of the lead portion of the [REDACTED] service line from the external shut-off valve to the water main on Bryant Street.

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, November 04, 2015 1:58 PM
To: 'bwright@cityofflint.com'; Michael Glasgow
Cc: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: Corrosion Control Permit
Attachments: PO4 Permit Oct 28th.pdf

Brent, Michael

Attached is the Act 399 permit authorizing installation of the corrosion control treatment system at the water treatment plant.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151104 OCT 28 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976			
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537	<table border="1"> <tr> <td> 4. Project Location (City, Village, Township): Flint, MI </td> <td> 5. County (location of project): Genesee </td> </tr> </table>		4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee
4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee			
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment 4 Corrosion Control				

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

CC:

DEQ
 RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

Issued by:

Reviewed by:

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project entails installation of phosphate feed systems at both Control Station #2 (CS#2) and Pump Station #4 (PS#4). Feed at CS#2 will provide the ability to add phosphate for corrosion control to finished water supplied from the Detroit Water & Sewer Department (DWSD). Feed at PS#4 will provide the ability to add phosphate to finished water to supply from either the Flint River or Lake Huron via the Karegondi Water Authority (KWA). Both feed systems are temporary systems until the planned filter transfer pump station is constructed. A permanent phosphate feed system will be constructed as part of that contract.

The feed rate will be proportionally controlled based on the water flow rate and will be tied to the existing SCADA system. See attached basis of design for more detailed information.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeremy Nakashima, PE
Lockwood, Andrews and Newnam, Inc.
1311 South Linden Rd, Suite B
Flint, MI 48532
jnnakashima@lan-inc.com

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?
(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☒ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the PLANT SUPERVISOR (title/position) for

CITY OF FLINT WATER PLANT (entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

[Signature]
Signature*

10-16-2015 Date (810) 787-4537 Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 4 Corrosion Control

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application all customers
- C. Total number of service connections ultimately served by entire project all customers
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|---------------------------|
| 1. Initial design average day flow (mgd) | <u>18.3</u> |
| 2. Initial design maximum day flow (mgd) | <u>25.4</u> |
| 3. Total design average day flow (mgd) | <u>24.0</u> |
| 4. Total design maximum day flow (mgd) | <u>36.0</u> |
| 5. Required fire flows: ⁽¹⁾ | _____ gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
|------------------------|

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

City of Flint

Phase II, Segment 4 Corrosion Control

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that initially there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal. Phosphoric acid will be stored in delivered totes and will be placed with containment pallets for dual containment.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.



**Lockwood, Andrews
& Newnam, Inc.**

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

☐ UPS ☐ DELIVERY SERVICE
☐ FEDEX ☐ HAND DELIVER
☐ OVERNIGHT

☐ REGULAR MAIL
☐ PICK-UP
☒ OTHER Extranet (To PM)

Est. 1935

AUSTIN, TX
CHICAGO, IL
CLEARWATER, FL
COLLEGE STATION, TX
DALLAS, TX
FLINT, MI
FORT WORTH, TX
HOUSTON, TX
HUNTINGTON BEACH, CA
LAS VEGAS, NV
LOS ANGELES, CA
MIAMI, FL
MILPITAS, CA
PHOENIX, AZ
SACRAMENTO, CA
SAN ANTONIO, TX
SAN MARCOS, TX
WACO, TX

To: Michael Prysby		Date: 10-16-13	
Company: MDEQ		Project Number: 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature	

Quantity	Description
3	Full Set of Plans for Ph2-Seg4 Corrosion Control
1	Act 399 Permit Application
1	11x17 Set of Plan for Ph2-Seg4 Corrosion Control

Remarks

These plans have been modified slightly from the set electronically submitted last night.

We look forward to your comments and approval.

Thanks.

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532
TEL 810.820.2682
FAX 810.820.2703
www.lan-inc.com

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matta, PE

IBC TOTE SCALE

FOR CHEMICAL IBC TOTES

Safely track
chemical usage
and tank levels

Warn of dangerous
over and under-
feed conditions

Prevent system
from running
empty

4-20mA remote
monitoring reduces
operator exposure
to chemicals

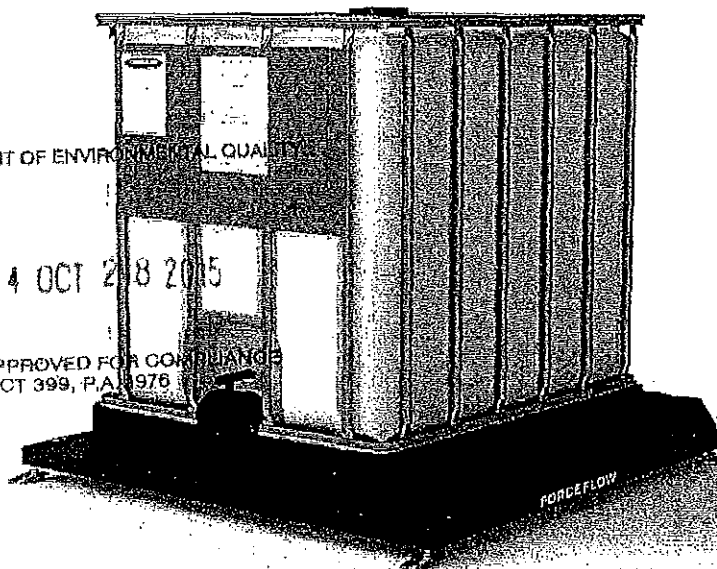
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MEP



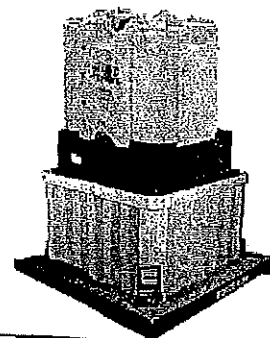
NO FINGER POINTING,
NO FINE PRINT, NO



Strict federal and state reporting requirements have created a need for water and wastewater plant operators to easily and accurately track chemical feed rates and usages. The IBC Tote Scale gives you this information along with the assurance that your chemical supply will not unexpectedly run out.

The heavy duty steel platform is protected with our advanced 80 mil thick TUF-COAT™ Environmental Armor. Tuf-Coat is highly resistant to chemicals, abrasion, impact and ultraviolet light degradation making the IBC Tote Scale ideal for even the harshest environments. Options include 316 stainless steel and MaxSense™ high accuracy models.

The IBC Tote Scale utilizes weighing technology to create a highly reliable, non-contacting chemical monitoring system that avoids problems other sensor technologies face caused by irregular tank shapes, corrosive chemical fumes, fluctuating temperatures and changes in specific gravity.



FORCE FLOW

IBC TOTE SCALE

MODELS AND ORDERING INFORMATION

IBC Tote Scales do not include weight indicating instrument. Select from the following: Wizard 4000® Advanced Digital Display (Bulletin 518), the SOLO® G2 Digital Weight Display (Bulletin 516), the SOLO XT® Hydraulic Digital Display (Bulletin 514), the Century Hydraulic dial (Bulletin 519) or Hypo Track® (Bulletin 517). Please order indicator separately.

ELECTRONIC - Single Load Cell Platform (Includes platform with backstop and electronic load cell with 20 ft. cable. Lengths up to 100 ft. available; request when ordering.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DR××TB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
54-DR××TBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
60-DR××TB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/4 of 1% FS
60-DR××TBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/4 of 1% FS



WIZARD 4000®



SOLO® G2



HYPO TRACK®



ELECTRONIC - Hi Accuracy 4-Load Cell Platform (Includes platform and (4) electronic load cells with 20 ft. of cable. Lengths up to 100 ft. available; request at time of purchase. Backstop not included or necessary on these models but available upon special request.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DR××TB-HA4	TUF-COAT® STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
54-DR××TBS-HA4	316 STAINLESS STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
60-DR××TB-HA4	TUF-COAT® STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS
60-DR××TBS-HA4	316 STAINLESS STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS



WIZARD 4000®



SOLO® G2



HYPO TRACK®



HYDRAULIC - Single Load Cell Platform (Includes platform with backstop, and hydraulic load cell with 12 ft. hose and quick connect. Hose/tubing lengths up to 100 ft. available to allow remote mounting of indicator; request at time of purchase.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-HY××TB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
54-HY××TBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
60-HY××TB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/2 of 1% FS
60-HY××TBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/2 of 1% FS



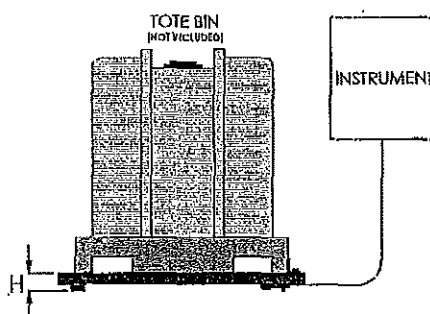
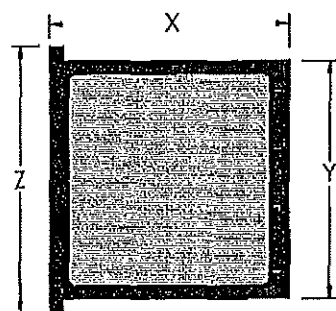
CENTURY®



SOLO XT®



×× = CAPACITY: 1000 lbs = "10", 2000 lbs = "20", 3000 lbs = "30", 4000 lbs = "40", 5000 lbs = "50"



SPECIFYING GUIDELINES:

- For maximum accuracy, size scale capacity to match the gross weight (chemical plus tote tare weight).
- Tote size should not exceed platform size.
- Supply connections must be flexible and preferably connected to tote over pivoted side of platform.

Please visit www.forceflow.com for drawings, engineered specifications and manuals.

FORCE FLOW

MODEL NUMBERS (for Load Cell & Platform)

60-DR30TC-HA4 (3,000 Lbs.) 60" x 60" x 3.25"
 60-DR40TC-HA4 (4,000 Lbs.) 60" x 60" x 3.25"
 60-DR50TC-HA4 (5,000 Lbs.) 60" x 60" x 3.25"
 60-DR60TC-HA4 (6,000 Lbs.) 60" x 60" x 3.25"

For Stainless Steel platform, as "S" after "TC", i.e. 60-DR30TCS-HA4.
 For other capacities and platform sizes, consult factory.

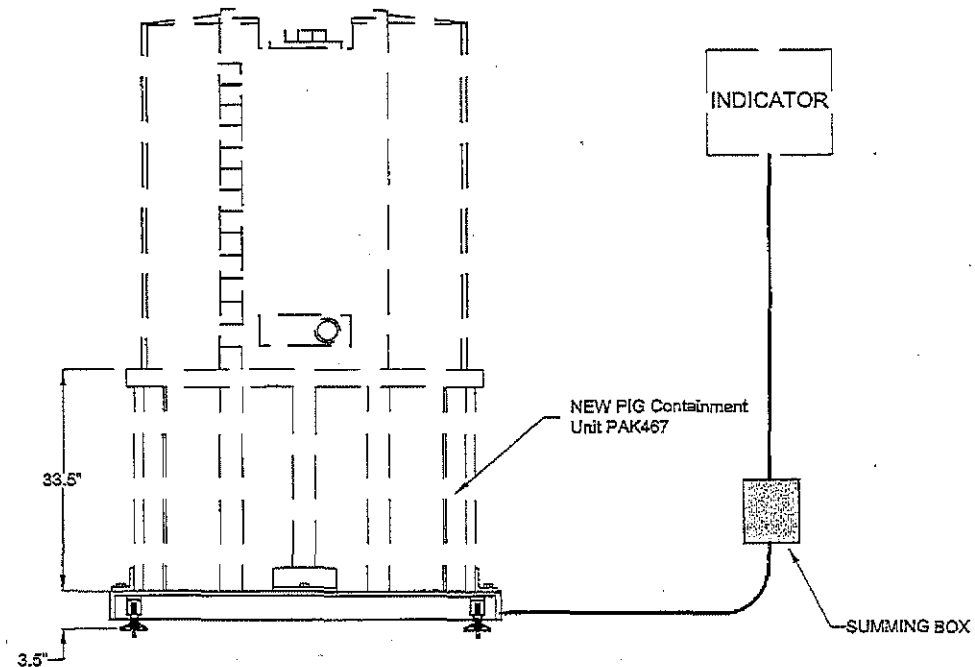
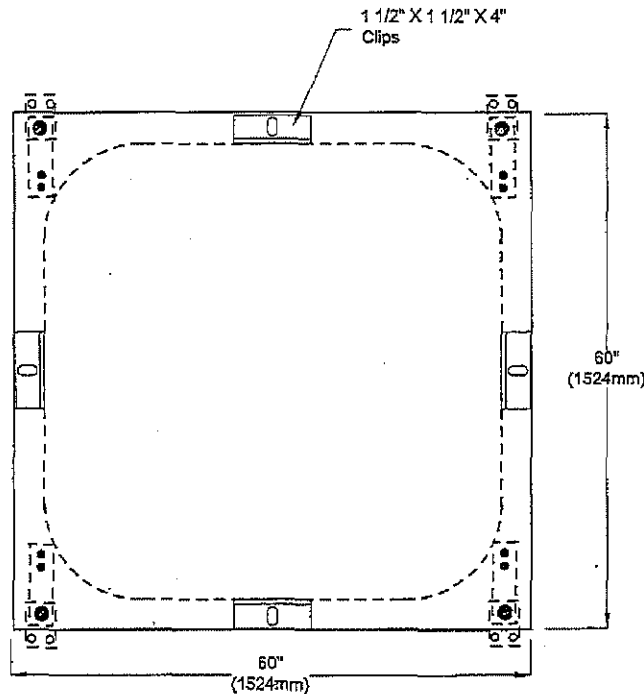
MODEL NUMBER (for SOLO 1000 Indicator)

SR-1000-1 1-Channel SOLO 1000 Indicator
 SR-1000-2 2-Channel SOLO 1000 Indicator

MODEL NUMBER (Containment Unit)

PAK467 400 gal. NEW PIG Poly IBC Containment Unit

_____ Scale Model Number
 _____ Pounds or Kilogram Indication
 _____ Feet of Cable (20' Standard)
 _____ Tote Skid Size
 400 _____ Containment Size (Gallons)

**INSTALLATION NOTE:**

We recommend using a forklift to load/unload totes.
 If a pallet jack is to be used, scale platform must be plt mounted so deck is flush with floor surface.
 Surface mounting with use of inclined load ramps are NOT RECOMMENDED.

FORCE FLOW

2430 Stanwell Dr, Concord, Ca 94520 USA
 1-800-893-6723 US & Canada, Fax: 925-686-6713
 WWW.forceflow.com / Info@forceflow.com

PL_BA11L_SUBMITTAL FORMS/Access Drawings/31431 HA Tote Bin Scale 60 Containment/Eng

HI-ACCURACY ELECTRONIC
 60" TOTE BIN SCALE
 CONTAINMENT

Drawn by: KBV

Date: 1/23/09

Revised: 4/13/10

Scale:

Drawing Number

31431

---NOT SUPPLIED BY FORCE FLOW---
For use with Force Flow Scale Model 60-DR100TCH44



New Pig

Your partner for a clean
and safe workplace.

1-800-HOT-HOGS® (468-4647)

Product Data Sheet

Item Number: PAK467

Item Name: PIG® Poly IBC Containment Unit

Load Capacity UDL:

- 12000 lbs./each (5443.2 kg/each)

Sump Capacity:

- 400 gal./each (1514 L/each)

Options Available:

Item #	Size	Color	Misc. Features	Amount	Length	Width	Height	Depth	Int. Dia.	Ext. Dia.	Weight	Qty/Pallet
PAK467	—	—	—	1 each	58" (147.3cm)	58" (147.3cm)	33.5" (85.1cm)	—	—	—	415lbs. (188.2kg)	1

Color: White/Black

Description:

Polyethylene containment unit used to help meet containment regulations when storing IBCs.

Application:

Used to help meet containment regulations when storing IBCs of 400 gallons or less containing materials compatible with polyethylene. IBCs can be stacked two high.

Product Features:

Super-strong Containment Unit helps you comply with regulations and store IBC tanks safely. Capture leaks, drips and spills to keep floors dry and workers safe.

- Heavy-duty construction permits double-stacking of IBCs to save space
- Solid anti-slip deck holds a variety of IBC sizes; if tank has feet or pegs, be sure to use proper support pads or plates
- Positioning pegs in pedestals keep deck from shifting
- Polyethylene construction resists UV rays, rust, corrosion and most chemicals
- Translucent white sidewalls allow easy visual inspection
- Arrives ready to use with no assembly required

Composition:

- Sump - Polyethylene
- Grates - Injection Molded Polyethylene

This product helps you comply with:

Regulatory Citation	Summary
40 CFR 264.175	Hazardous waste containment systems must be free of structural cracks or gaps, be designed to keep spilled liquids from remaining in contact with the container, prevent run-on and "have sufficient capacity to contain 10% of the volume of the containers, or the volume of the largest container, whichever is greater."

Additional Specifications:

- Dimensions (Grate): 52" L x 52" W

Disclaimers:

- **Flammables Notice:** If using this product with flammable liquids, please consider the regulations that apply to storage and handling of flammable liquids and the safety of this application, specifically flammable vapors, static discharge and heat sources. For further assistance, please call Technical Services.

PDS generated: Jul 14, 2008

One Pork Avenue, Tipton, PA 16684-0304 • 1-800-HOT-HOGS® (468-4647)
Fax: 1-800-621-PIGS® (621-7447) • Email: hothogs@newpig.com • Web: newpig.com

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Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal $5,974 \times 0.75$

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 $4,480 / 97.9913$

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{-3}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{-3}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

Proposed Operating Parameters

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

	Plant Flow	Dosage as PO_4^{-3} *	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/l	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

Maximum feed rate (Max Flow $\times$ Max Dosage)

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 2.0 \text{ ppm} / 1,408 \text{ g/gal} = 134.30 \text{ gpd Phosphoric Acid}$$

Average feed rate (Avg Flow $\times$ Avg Dosage)

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 26.21 \text{ gpd Phosphoric Acid}$$

Minimum feed rate (Min Flow $\times$ Min Dosage)

$$8 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 13.10 \text{ gpd Phosphoric Acid}$$

Storage Requirements

30 days supply at average flow and dosage = $26.21 \text{ gpd} \times 30 \text{ days} = 786 \text{ gal}$.

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

Four Function Valve
AUTOPRIME™ Liquid End
High Viscosity Liquid End
Low Level Float Switch
Digi-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

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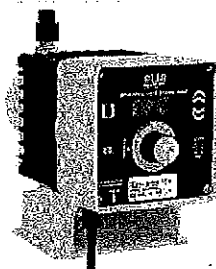
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[LMI](#) [PRODUCTS](#) [Metering Pumps](#) [Series C Chemical Metering Pumps](#)

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps have been an industry standard for over 20 years. Designed for Municipal/Industrial applications, the familiar yellow and black pumps have a rugged, totally enclosed, chemically resistant housing for protection in the harshest environments. Encapsulated electronics and a rigid housing and stroke bracket ensure years of precise, repeatable performance.



High Resolution Image

Request a Quote



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Adjustable stroke frequency and the flexibility of up to 1000:1 turndown ratio
 Manually adjustable stroke length provides accurate pump output adjustment
 NEMA 4X / IP65 enclosures for protection against corrosive environments
 Time tested electronics for reliable, repeatable performance
 Totally encapsulated electronics for protection against moisture and corrosive conditions
 Inputs for low level switch available on certain models
 Models with external pacing for flow proportional applications
 Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)
 *UL, *CUL, NSF 60, NSF 61, *CE Certifications

Control Codes:

1 -- Dual Manual Control (speed and stroke length)
 7 -- Pulse Input / Dual Manual Control
 9 -- Pulse/Analog Input / Dual Manual Control

Output Codes with standard fluid end	
Max Capacity:	Max Pressure:
*CX0 - 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
*CX1 - 2.5 GPH (9.5 l/h)	150 psi (10.3 Bar)
*CX2 - 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 - 6.0 GPH (30.3 l/h)	80 psi (4.1 Bar)
*CX4 - 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 - 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 - 10.0 GPH (38.0 l/h)	80 psi (5.6 Bar)
C78 - 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 26 2015

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MTP

Rennaker, Joanne (DEQ)

From: Shaler, Karen (DEQ)
Sent: Wednesday, November 04, 2015 1:28 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Cc: Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-11-09 Action Steps Week of November 2-6.docx

Attached is the updated version that now also includes the status from the last action steps document.

George: This is saved to the usual location on our S drive. Please work from this version when providing info for the next update to be submitted on November 9. Thanks.

From: Krisztian, George (DEQ)
Sent: Monday, November 02, 2015 1:36 PM
To: Shekter Smith, Liane (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6

I added the word "assist" to Action Item #3 to make it clear what our role was.

George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
 Cell ph (517) 420-5897

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6

Suggested draft Action Steps attached.

City of Flint Water Action Steps for Week of November 2-6

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	Meeting held on 10/29/15 to discuss time line
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	Draft language submitted to Maggie Pallone for review
3.	Assist After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	Panel created and press release issued on 10/21/15
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	Negotiations underway to contract with the Genesee County Health Department
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	A summary report for Freeman Elementary School has been drafted
7.	Contact DHHS regarding lead education material for schools; provide information as requested by DHHS	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	Meeting held on 10/27/15; action items created
8.	Follow up with city of Flint regarding corrosion control treatment and their plans to address requirements and options provided for in 10/30/15 DEQ letter	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
9.	E-mail city of Flint regarding timing to install corrosion control now that the construction permit has been issued	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
10.	Review Monthly Operation Reports for Standby Operation of Flint Water Treatment Plant with city of Flint; draft letter to city of Flint documenting Standby Operation requirements	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
11.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues; check weekly for status update	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	Issues regarding soil erosion controls during construction are being addressed
12.	Continue evaluating city of Flint Service Line Record status and comparison to sampling pool	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	Cross-referencing process has begun
13.	Provide DHHS with any available cross-reference information regarding lead service lines and plumbing materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Develop childcare facility guidance or review DHHS-related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	Meeting held on 10/27/15; DHHS to provide materials
15.	Develop draft sampling protocol for residential exposure assessment for DHHS	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
16.	Make progress on drafting a generic school sampling guidance document for statewide distribution; target audience: schools served by municipal water	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	Final draft of school sampling protocol has been written and is awaiting final review
17.	Attend 11/5/15 meeting arranged by DHHS regarding residential elevated blood lead investigations and water testing	DEQ and DHHS	Jim Sygo George Krisztian Steve Busch	

Rennaker, Joanne (DEQ)

From: Brent Wright <bwright@cityofflint.com>
Sent: Wednesday, November 04, 2015 1:13 PM
To: Prysby, Mike (DEQ)
Cc: Michael Glasgow; Howard Croft (hcroft@cityofflint.com); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: Re: Installation of Corrosion Control Treatment

Mike,

We still have not received the permit from the DEQ. Do you know when it was mailed?

Brent

On Wed, Nov 4, 2015 at 12:55 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Michael,

Please notify our department regarding the anticipated timeframe to install the corrosion control treatment system at the water treatment plant. The timeframe should take into account estimated time to receive the chemical feed pumps, storage equipment, and the orthophosphate compound. Coordination of the contractor to install the equipment also needs to be included. If there any delays with the installation of the corrosion control treatment system, please notify us as soon as possible. Finally, please inform us when the corrosion control treatment system is installed. If this occurs by next Monday, I may take the opportunity to conduct an inspection prior to our 12pm meeting.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

--
Brent Wright
Water Plant Supervisor
City of Flint
4500 N. Dort Hwy.
Flint, MI. 48505
Ph: 810.787.6537 ext. 3510

Fx: 810.787.3710

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, November 04, 2015 12:55 PM
To: Michael Glasgow
Cc: Howard Croft (hcroft@cityofflint.com); 'bwright@cityofflint.com'; Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: Installation of Corrosion Control Treatment

Michael,

Please notify our department regarding the anticipated timeframe to install the corrosion control treatment system at the water treatment plant. The timeframe should take into account estimated time to receive the chemical feed pumps, storage equipment, and the orthophosphate compound. Coordination of the contractor to install the equipment also needs to be included. If there any delays with the installation of the corrosion control treatment system, please notify us as soon as possible. Finally, please inform us when the corrosion control treatment system is installed. If this occurs by next Monday, I may take the opportunity to conduct an inspection prior to our 12pm meeting.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Wednesday, November 04, 2015 12:07 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: see attached spreadsheet
Attachments: Freeman with sequentials.xlsx

George L. Krisztian
Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
Desk ph (517) 284-6719
Cell ph (517) 420-5897

SAMPNO	ACODE	ANALYTE	RESULT	QUALIFY	Sample Description
LF88751	PB	Lead	0.01		CF022 RM 12
LF88752	PB	Lead	0.003		CF022 RM 12
LF88753	PB	Lead	0.001		CF022 RM 12
LF88754	PB	Lead	0.001		CF022 RM 12
LF88755	PB	Lead	0.004		CF021 RM 12
LF88756	PB	Lead	0.007		CF021 RM 12
LF88757	PB	Lead	Not detected		CF021 #12
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LF88759	PB	Lead	0.009		CF009 RM 5
LF88760	PB	Lead	0.002		CF009 RM 5
LF88761	PB	Lead	0.002		CF009 RM 5
LF88762	PB	Lead	0.001		CF009 RM 5
LF88763	PB	Lead	0.102		CF015 RM 11
LF88764	PB	Lead	0.326		CF015 RM 11
LF88765	PB	Lead	0.014		CF015 RM 11
LF88766	PB	Lead	0.011		CF015 RM 11
LF88767	PB	Lead	0.003		CF016 RM 11
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LF88770	PB	Lead	0.004		CF016 RM 11
LF88771	PB	Lead	0.009		CF027 RM 21
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LF88774	PB	Lead	Not detected		CF027 RM 21
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LF88783	PB	Lead	0.023		CF024 RM #19
LF88784	PB	Lead	0.003		CF024 RM #19
LF88785	PB	Lead	0.004		CF024 RM #19
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LF88787	PB	Lead	0.005		KC003 COMMUNITY ROOM
LF88788	PB	Lead	0.002		KC003 COMMUNITY ROOM
LF88789	PB	Lead	Not detected		KC003 COMMUNITY ROOM
LF88790	PB	Lead	Not detected		KC003 COMMUNITY ROOM
LF88791	PB	Lead	0.009		CF023 RM #19
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LF88795	PB	Lead	0.015		DW002 HALLWAY
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LF88797	PB	Lead	0.004		DW002 HALLWAY
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LF88805	PB	Lead	0.004	DW001 HALLWAY
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LF88828	PB	Lead	0.007	CF014- ROOM #10
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LF88843	PB	Lead	0.009	CF013 ROOM #10
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LF88847	PB	Lead	0.013	CF020 ROOM #17
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LF88851	PB	Lead	0.016	CF006 ROOM#2
LF88852	PB	Lead	0.003	CF006 ROOM #2
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LF88867	PB	Lead	0.012	CF004 ROOM #1
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LF88870	PB	Lead	0.002	CF004 ROOM #1
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LF88873	PB	Lead	0.003	DW005 ROOM #1
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LF89578	PB	Lead	Not detected	CF027
LF89579	PB	Lead	Not detected	CF027
LF89580	PB	Lead	Not detected	CF027
LF89581	PB	Lead	Not detected	CF027
LF89582	PB	Lead	Not detected	CF027

SampleCollector	Site Code
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ANDY NEWMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/ GEORGE KRISZTIA	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/ GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/ GEORGE KRISZTIA	P1
TRACY JO DEVEREAUX	P2

TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR /ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAR	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY / LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY / LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1

MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
TJD/GLK	CA1
TJD/GLK	CA2
TJD/GLK	CA3
TJD/GLK	CA4
TJD/GLK	CAS
TJD/GLK	CA6
TJD/GLK	CA7
TJD/GLK	CA8
TJD/GLK	CA9
TJD/GLK	CA10
TJD/GLK	CB1
TJD/GLK	CB2
TJD/GLK	CB3
TJD/GLK	CB4
TJD/GLK	CB5
TJD/GLK	CB6
TJD/GLK	CB7
TJD/GLK	CB8
TJD/GLK	CB9
TJD/GLK	CB10
TJD/GLK	CC1
TJD/GLK	CC2
TJD/GLK	CC3
TJD/GLK	CC4
TJD/GLK	CC5
TJD/GLK	CC6
TJD/GLK	CC7
TJD/GLK	CC8
TJD/GLK	CC9
TJD/GLK	CC10

Rennaker, Joanne (DEQ)

From: Graham, Lois (DEQ)
Sent: Tuesday, November 03, 2015 2:16 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Krisztian, George (DEQ)
Subject: FW: DEQ-Laboratory Report-Genesee-2015-10-30
Attachments: GENESEE-2015-10-30.PDF

Page 21 see 0.131 mg/L lead; copper 0.55 mg/L

-----Original Message-----

From: DEQ-DWR-LABREPORTS
Sent: Friday, October 30, 2015 8:57 AM
To: GCHD-EHWATER@GCHD.US; Graham, Lois (DEQ); DEQ-DWMA-Lansing
Subject: DEQ-Laboratory Report-Genesee-2015-10-30

Dear Drinking Water Laboratory Client,

A PDF file containing your analytical results has been attached to this e-mail.

Please do not reply directly to this e-mail. It is an automated account that does not respond to incoming messages.

Please contact the laboratory directly at (517) 335-8184 with questions regarding your report.

Thank you for using the MDEQ Drinking Water Laboratory.

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF89162

Official Laboratory Report

Report To: TERRY CHITTLE
2414 N HENDERSON RD
DAVISON MI 48423

System Name/Owner: TERRY CHITTLE
Collection Address: 2414 N HENDERSON RD, DAVISON
Collected By: TERRY CHITTLE
Township/Well#/Section: DAVISON//
County: Genesee
Sample Point: BATH SINK
Water System: Treated/Softened Private Well

WSSN/Pool ID:
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/26/2015 19:00
Date Received: 10/28/2015 07:45
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Coliform Organisms per 100 mL	Not Detected	10/28/2015	SM 9223 B	TC-00-B

Sample was more than 30 hours old when analyzed. Coliform result is possibly invalid for testing done more than 30 hours after sample collection.

Explanation of Coliform Results:

Not Detected = Coliform and E. coli bacteria were not found

Positive = Total Coliform was found and E. coli bacteria was not found

EC Positive = Coliform and E. Coli bacteria were found

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF89184**

Official Laboratory Report

Report To: TERRY CHITTLE
2414 N HENDERSON RD
DAVISON MI 48423

System Name/Owner: TERRY CHITTLE
Collection Address: 2414 N HENDERSON RD, DAVISON
Collected By: TERRY CHITTLE
Township/Well#/Section: DAVISON//
County: Genesee
Sample Point: BATH SINK
Water System: Treated/Softened Private Well

WSSN/Pool ID:
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/26/2015 18:20
Date Received: 10/28/2015 07:46
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Arsenic	0.042	10/29/2015	0.002	0.010	EPA 200.8	7440-38-2

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF89213**

Official Laboratory Report

Report To: CITY OF DAVISON
200 E FLINT ST
DAVISON MI 48423

System Name/Owner:	CITY OF DAVISON	WSSN/Pool ID:	1720
Collection Address:	400 S DAYTON, DAVISON	Source:	TYPE I
Collected By:	STEVE DAVIS	Site Code:	D
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/27/2015 08:00
Sample Point:	KITCHEN	Date Received:	10/28/2015 08:25
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Coliform Organisms per 100 mL	Not Detected	10/28/2015			SM 9223 B	TC-00-B
Explanation of Coliform Results:			Not Detected = Coliform and E. coli bacteria were not found Positive = Total Coliform <u>was found</u> and E. coli bacteria <u>was not found</u> EC Positive = Coliform and E. Coli bacteria were found			

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF89214

Official Laboratory Report

Report To: CITY OF DAVISON
200 E FLINT ST
DAVISON MI 48423

System Name/Owner:	CITY OF DAVISON	WSSN/Pool ID:	1720
Collection Address:	DAVISON WATER TREATMENT PLANT, DA	Source:	TYPE I
Collected By:	STEVE DAVIS	Site Code:	TP001
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/27/2015 08:30
Sample Point:	PLANT TAP	Date Received:	10/28/2015 08:25
Water System:	Pressure Tank/Plant Tap	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Coliform Organisms per 100 mL	Not Detected	10/28/2015			SM 9223 B	TC-00-B
Explanation of Coliform Results: Not Detected = Coliform and E. coli bacteria were not found Positive = Total Coliform <u>was found</u> and E. coli bacteria <u>was not found</u> EC Positive = Coliform and E. Coli bacteria were found						

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF89215

Official Laboratory Report

Report To: CITY OF DAVISON
200 E FLINT ST
DAVISON MI 48423

System Name/Owner:	CITY OF DAVISON	WSSN/Pool ID:	1720
Collection Address:	126 N MAIN ST, DAVISON	Source:	TYPE I
Collected By:	STEVE DAVIS	Site Code:	D
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/27/2015 07:30
Sample Point:	KITCHEN	Date Received:	10/28/2015 08:25
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Coliform Organisms per 100 mL	Not Detected	10/28/2015			SM 9223 B	TC-00-B

Explanation of Coliform Results:

Not Detected = Coliform and E. coli bacteria were not found

Positive = Total Coliform was found and E. coli bacteria was not found

EC Positive = Coliform and E. Coli bacteria were found

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF89216**

Official Laboratory Report

Report To: CITY OF DAVISON
200 E FLINT ST
DAVISON MI 48423

System Name/Owner:	CITY OF DAVISON	WSSN/Pool ID:	1720
Collection Address:	WELL #3, DAVISON	Source:	TYPE I
Collected By:	STEVE DAVIS	Site Code:	D
Township/Well#/Section:	/3/	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/27/2015 09:00
Sample Point:	WELL TAP	Date Received:	10/28/2015 08:25
Water System:	Public System Well	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Coliform Organisms per 100 mL	Not Detected	10/28/2015			SM 9223 B	TC-00-B

Explanation of Coliform Results:

Not Detected = Coliform and E. coli bacteria were not found

Positive = Total Coliform was found and E. coli bacteria was not found

EC Positive = Coliform and E. Coli bacteria were found

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88749**

Official Laboratory Report

Report To: FLINT ELKS 222
7177 E MAPLE RD
GRAND BLANC MI 48439

System Name/Owner:	FLINT ELKS 222	WSSN/Pool ID:	
Collection Address:	7177 E MAPLE RD, GRAND BLANC	Source:	TYPE II
Collected By:	STEPHEN ROSE	Site Code:	SETTLING TANK VESSELS 2 & 3
Township/Well#/Section:	DAVISON//31	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/22/2015 10:15
Sample Point:	BACKWASH VESSELS 2 & 3	Date Received:	10/24/2015 09:22
Water System:	Treated/Softened Private Well	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Arsenic	0.039	10/27/2015	0.002	0.010	EPA 200.8	7440-38-2

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF89227**

Official Laboratory Report

Report To: TERESA WOOD
5335 BURWICK
GRAND BLANC MI 48439

System Name/Owner: TERESA WOOD
Collection Address: 5335 BURWICK, GRAND BLANC
Collected By: TERESA WOOD
Township/Well#/Section: ATLAS//
County: Genesee
Sample Point: UPSTAIR BATH SINK
Water System: Treated/Softened Private Well

WSSN/Pool ID:
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/27/2015 15:10
Date Received: 10/28/2015 08:36
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Coliform Organisms per 100 mL	Not Detected	10/28/2015			SM 9223 B	TC-00-B
Explanation of Coliform Results: Not Detected = Coliform and E. coli bacteria were not found Positive = Total Coliform <u>was found</u> and E. coli bacteria <u>was not found</u> EC Positive = Coliform and E. Coli bacteria were found						
Arsenic	0.045	10/29/2015	0.002	0.010	EPA 200.8	7440-38-2
Chloride	69	10/28/2015	4		SM 4500-Cl E	7647-14-5
Fluoride	0.60	10/28/2015	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	Not detected	10/28/2015	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	10/28/2015	0.1		SM 3500 FeB	7439-89-6
Nitrate as N	Not Detected	10/28/2015	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	10/28/2015	0.05	1	10-107-04-2-B	14797-65-0
Sodium (automated)	170	10/28/2015	5		SM 3500 NaB	7440-23-5
Sulfate	Not detected	10/28/2015	10		SM 4500 SO ₄ E	14808-79-8

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF89250**

Official Laboratory Report

Report To: AMIEE ARMSTRONG
6404 WAGNER AVE
GRAND BLANC MI 48439

System Name/Owner:	AMIEE ARMSTRONG	WSSN/Pool ID:	
Collection Address:	6404 WAGNER AVE, GRAND BLANC	Source:	Single Family Dwelling
Collected By:	AMIEE ARMSTRONG	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	10/27/2015 12:15
Sample Point:	KITCHEN	Date Received:	10/28/2015 08:43
Water System:	Untreated Private Well	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Arsenic	Not detected	10/29/2015	0.002	0.010	EPA 200.8	7440-38-2

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88949**

Official Laboratory Report

Report To: **MIKE GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:
Collection Address: **2413 WINONA ST, FLINT**
Collected By: **SUZAN EARLY**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Other**
Date Collected: **10/23/2015 08:00**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



Sample Number
LF88950

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 3813 CHEROKEE AVE #1, FLINT
Collected By: FAUN BULLEN
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID:
Source: Other
Site Code:
Collector: Private Citizen
Date Collected: 10/26/2015 11:15
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LF88951**

Official Laboratory Report

Report To: **MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505**

System Name/Owner: **CITY OF FLINT**
Collection Address: **225 W COURT ST #1, FLINT**
Collected By: **A PAUL WALLING**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/23/2015 15:30**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.07	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88952**

Official Laboratory Report

Report To: **MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505**

System Name/Owner: **CITY OF FLINT**
Collection Address: **1549 E ATHERTON RD, FLINT**
Collected By: **KERRY MASON**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/20/2015 05:00**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



**Sample Number
LF88953**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	
Collection Address:	4025 PENGELLY RD APT #10, FLINT	Source:	Other
Collected By:	CLARENCE D ELLISON	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	10/20/2015 07:41
Sample Point:	KITCHEN	Date Received:	10/26/2015 15:42
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88954**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 225 W COURT ST #2, FLINT
Collected By: A PAUL WALLING
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/23/2015 15:30
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.036	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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DRINKING WATER LABORATORY**

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



**Sample Number
LF88955**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 829 WELLINGTON AVE, FLINT
Collected By: ADAM-CHRISTINA MURPHY
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/26/2015 07:00
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.22	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88956**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 3709 CLAIRMONT ST, FLINT
Collected By: DAN CARROLL
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID:
Source: Other
Site Code:
Collector: Private Citizen
Date Collected: 10/17/2015 06:00
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.08	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88957**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 3901 CHEROKEE AVE, FLINT
Collected By: BARBARA COX
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/19/2015 08:30
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.08	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF88958

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 726 STOCKTON ST, FLINT
Collected By: KIMBERLY SKELLETT
Township/Well#/Section: //
County: Genesee
Sample Point:
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/23/2015 07:30
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.07	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF88959**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 801 STOCKTON ST, FLINT
Collected By: GERALDINE ESTEP
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID:
Source: Other
Site Code:
Collector: Private Citizen
Date Collected: 10/23/2015 08:00
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.19	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



**Sample Number
LF88960**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 829 E WELLINGTON AVE, FLINT
Collected By: ADAM-CHRISTINA MURPHY
Township/Well#/Section: //
County: Genesee
Sample Point: BACK SPICKET
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/26/2015 07:10
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.55	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.131	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LF88961**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 1006 BEARD ST, FLINT
Collected By: MICHAEL A WILLIAMS
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/03/2015 08:00
Date Received: 10/26/2015 15:42
Purpose: Other

Sample Comment **LF88961** **Sample had exceeded EPA holding time for this analysis when received in the laboratory.**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF88962

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **3746 RICHFIELD RD, FLINT**
Collected By: **ERICK HEMPEL**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **BATHROOM**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/14/2015 07:00**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LF88963**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1421 UNIVERSITY AVE, FLINT	Source:	Single Family Dwelling
Collected By:	CAMERON STEWART	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	10/06/2015 15:45
Sample Point:	KITCHEN	Date Received:	10/26/2015 15:42
Water System:	Other	Purpose:	Other

Sample Comment **LF88963** **Sample had exceeded EPA holding time for this analysis when received in the laboratory.**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.25	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.009	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF88964

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 1302 FLUSHING RD, FLINT
Collected By: CHRIS BURROWS
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/22/2015 17:00
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF88965

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 225 W COURT ST #3, FLINT
Collected By: A PAUL WALLING
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/23/2015 15:30
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.05	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



Sample Number
LF88966

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **620 E TAYLOR ST, FLINT**
Collected By: **TAMMARA-ARNETTE CALLAWAY**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/20/2015 06:37**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.10	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pleper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



Sample Number
LF88967

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **3623 NORWOOD DR, FLINT**
Collected By: **SUSAN SULLIVAN**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/21/2015 07:25**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number

LF88968

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 3815 OGEMA AVE, FLINT
Collected By: REBECCA ROBERTSON
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/16/2015 17:45
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.41	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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FAX: (517) 335-8562



**Sample Number
LF88969**

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3220 DUPONT ST, FLINT	Source:	Single Family Dwelling
Collected By:	ANNIE MCDANIEL	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	10/20/2015 11:00
Sample Point:	BATHROOM	Date Received:	10/26/2015 15:42
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U. S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LF88970**

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **1421 UNIVERSITY AVE, FLINT**
Collected By: **CAMERON STEWART**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/09/2015 06:30**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

Sample Comment **LF88970** **Sample had exceeded EPA holding time for this analysis when received in the laboratory.**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF88971

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 502 CRAPO ST, FLINT
Collected By: EDWIN D CUSTER
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Other
Site Code:
Collector: Private Citizen
Date Collected: 08/21/2015 07:00
Date Received: 10/26/2015 15:42
Purpose: Other

Sample Comment **LF88971** **Sample had exceeded EPA holding time for this analysis when received in the laboratory.**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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FAX: (517) 335-8562



**Sample Number
LF88972**

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 555 COPEMAN BLVD, FLINT
Collected By: ELLANE RAJI
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Other

WSSN/Pool ID:
Source: Other
Site Code:
Collector: Private Citizen
Date Collected: 10/20/2015 04:25
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U. S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number
LF88973**

Official Laboratory Report

Report To: **MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505**

System Name/Owner: **CITY OF FLINT**
Collection Address: **3813 CHEROKEE AVE #2, FLINT**
Collected By: **FAUN BULLEN**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID:
Source: **Other**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/26/2015 11:15**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF88974

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 2400 BAGLEY ST, FLINT
Collected By: CAROLYN J SECORD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Other

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 10/20/2015 07:45
Date Received: 10/26/2015 15:42
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LF88975**

Official Laboratory Report

Report To: **MICHAEL GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **3713 KENT ST, FLINT**
Collected By: **BILLIE LINDO**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **10/20/2015 09:30**
Date Received: **10/26/2015 15:42**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	10/27/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	10/27/2015	0.001	0.015	EPA 200.8	7439-92-1

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Tuesday, November 03, 2015 8:09 AM
To: Natasha Henderson
Cc: Sean Kammer; Warren Green; Samir Matta; Lytle, Darren; Schock, Michael; Busch, Stephen (DEQ); Prysby, Mike (DEQ); rosejo@msu.edu; Michael Glasgow
Subject: Lunch Meeting Prior to Technical Advisory Mtg.

I am writing to confirm a lunch meeting invitation next **Monday November 9th at noon** which will be immediately prior to our technical advisory committee meeting. We would like to have a candid discussion about data and messaging with this select group. At the meeting we intend to have representatives from LAN, DEQ, EPA, along with City Officials. I am reserving seating at the White Horse Tavern located at **621 W Court St, Flint, MI 48503** located approximately 1.5 miles due west of City Hall on the same road - Court St.

Please email me if you have any questions.

Thank you,

--

Howard Croft
Public Works Director
City of Flint
1101 S. Saginaw Street
Flint, MI 48502
PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Tuesday, November 03, 2015 7:51 AM
To: Amy Hovey; Andy Leavitt; Anthony Chubb; Brent Wright; Darren Lytle; Dayne Walling; donna. cole; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; Howard Croft; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kevin J. Keane; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Schock, Michael; Michael Wright; Mike Lane; Prysby, Mike (DEQ); MVALACAK@gchd.us; Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Sean Kammer; Shawn Patrick McElmurry; Busch, Stephen (DEQ); Thompson, Sheryl D. (DHHS); Warren Green; Anderson, Madhu (DEQ)
Subject: Technical Advisory Committee Meeting Reminder

Technical Advisory Committee Members,

This is a reminder that our next technical advisory committee meeting is scheduled for **Monday November 9th at 2:00 pm** in order to accommodate the attendance of the EPA representatives. The City is committed to having the best national and in-state experts at the table to ensure the challenges with Flint's water are fully addressed. Many have already confirmed their attendance, we will have a call in number available for those who cannot be present. We will still hold the meeting at Flint City Hall at 2:00 pm in the same location as the last meeting and I will have an agenda ready as part of this weeks update which you should expect in the next few days.

Thank you,

--

Howard Croft
 Public Works Director
 City of Flint
 1101 S. Saginaw Street
 Flint, MI 48502
 PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Monday, November 02, 2015 3:39 PM
To: Prysby, Mike (DEQ)
Subject: Technical Advisory Meeting

Mike,

Good afternoon, I was just wondering when you and any other DEQ personnel would be arriving in town for the technical advisory meeting next Monday. City leaders would like to invite you to lunch prior to the meeting to discuss some items along with our engineers. I am also extending this invite to any EPA personnel attending the technical advisory meeting. We were looking to hold this meeting around noon. Please let me know if you would be able to make it at this time.

Thanks,

--

Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, November 02, 2015 2:46 PM
To: Krisztian, George (DEQ)
Subject: RE: Meetings in Flint

George,

The first meeting, next Monday is the Technical Advisory Committee meeting. Howard noted that an agenda will be sent to the TAC participants this week (early part of week). I will forward you and Madhu a copy of the agenda as soon as I receive one.

I will contact EPA regarding next Tuesday's meeting (EAP taskforce) and if an agenda is available.

Michael Prysby, P.E.
 District Engineer
 Office of Drinking Water and Municipal Assistance
 517 290-8817

From: Krisztian, George (DEQ)
Sent: Monday, November 02, 2015 2:28 PM
To: Prysby, Mike (DEQ)
Cc: Anderson, Madhu (DEQ)
Subject: Meetings in Flint
Importance: High

Mike can you please supply Madhu and me with some details regarding the meetings in Flint on Monday and Tuesday? If you don't have them can you please get with someone who can get the information to us.

Thank you!
 George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
 Cell ph (517) 420-5897

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Monday, November 02, 2015 1:36 PM
To: Shekter Smith, Liane (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-10-26 DRAFT Action Steps Week of November 2-6.docx

I added the word "assist" to Action Item #3 to make it clear what our role was.

George

George L. Krisztian
Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
Desk ph (517) 284-6719
Cell ph (517) 420-5897

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6

Suggested draft Action Steps attached.

City of Flint Water Action Steps for Week of November 2 - 6

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	
3.	Assist After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
7.	Contact DHHS regarding lead education material for schools. Provide information as requested by DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
8.	Follow up with City regarding corrosion control treatment and their plans to address requirements and options provided for in DEQ letter.	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
9.	E-mail City regarding timing to install corrosion control now that the construction permit has been issued.	DEQ	Jim Sygo Steve Busch Pat Cook	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
			Mike Prysby	
10.	Review MOR for Standby Operation of Flint Water Treatment Plant with city of Flint. Draft letter to City documenting Standby Operation Requirements.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
11.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues. Check weekly for status update.	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
12.	Continue evaluating city of Flint Service Line Record status and comparison to sampling pool.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Provide DHHS with any available cross-reference information regarding lead service lines and plumbing materials.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Develop childcare facility guidance or review DHHS related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
15.	Develop draft sampling protocol for residential exposure assessment for DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
16.	Make progress on drafting a generic school sampling guidance document for statewide distribution. Target audience: schools served by municipal water.	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
17.	Attend meeting arranged by DHHS regarding Residential EBL Investigations and Water Testing	DEQ and DHHS	Jim Sygo Steve Busch Mike Prysby	

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-10-26 DRAFT Action Steps Week of November 2-6.docx

Suggested draft Action Steps attached.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 30, 2015 5:29 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT DELIBERATIVE. Daily Update

Action Step 8: Review corrosion control treatment plan and get any EPA comments.

Comments received late today from EPA were addressed and the letter to the city regarding operational and monitoring conditions related to corrosion control was finalized. An electronic copy of the letter was sent to the city of Flint and EPA.

Action Step 16: Confirm plumbing assessment and sampling is scheduled for Brownell and Eisenhower Elementary Schools:

LARA and DEQ staff conducted plumbing assessments at both Brownell and Eisenhower Elementary Schools. Sampling taps were identified and labeled. And a sampling sequence was recommended for each school. A briefing of the plumbing layout and sampling details was provided to the sampling teams. Two sampling teams will be deployed on Saturday to conduct lead/copper sampling at both schools and additional sampling will be conducted at Freeman Elementary School.

Liane J. Shekter Smith, P.E.
Assistant to Chief Deputy Director Jim Sygo
Michigan Department of Environmental Quality
517-284-6543

Rennaker, Joanne (DEQ)

From: Shaler, Karen (DEQ)
Sent: Friday, October 30, 2015 5:28 PM
To: mglasgow@cityofflint.com
Cc: bwright@cityofflint.com; hcroft@cityofflint.com; Natasha Henderson; lytle.darren@epa.gov; SFMatta@lan-inc.com; jwgreen@lan-inc.com; jhenry@gchd.us; Dykema, Linda D. (DHHS); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Rennaker, Joanne (DEQ)
Subject: City of Flint - Corrosion Control Treatment Operation
Attachments: Flint CCT Operation Letter 10-30-15.pdf

Mr. Mike Glasgow,

Please see the attached letter from Michael F. Prysby, P.E., District Engineer, Office of Drinking Water and Municipal Assistance, Michigan Department of Environmental Quality. The original will be sent via U.S. Mail on Monday, November 2, 2015.

Karen Shaler, Management Assistant to
Chief Deputy Director Jim Sygo
Michigan Department of Environmental Quality
Constitution Hall, 6th Floor South
Phone: 517-284-6709
Fax: 517-241-7401
shalerk@michigan.gov



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as PO_4 , and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as PO_4 . As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as PO_4 (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

As part of the City water system operations, the City shall conduct:

- **Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as PO_4**
- **Daily monitoring of additional orthophosphate dosage, as PO_4**
- **Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as PO_4**

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

Enhanced Water Quality Parameter Monitoring

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as CaCO_3), Calcium (mg/L as Ca^{2+}), and orthophosphate (mg/L PO_4). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations, the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

- Turbidity (NTU)	- Calcium (mg/L as Ca^{2+})
- Iron (mg/L)	- Chloride (mg/L as Cl^-)
- Orthophosphate (mg/L PO_4)	- Temperature (Celcius)
- pH	- Conductivity (mS)
- Total Alkalinity (mg/L as CaCO_3)	

In addition to the 10 locations, the entry point to the distribution system should be one of the locations for enhanced water quality parameter monitoring.

If orthophosphate residual levels less than 3.1 mg/L as PO_4 (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as PO_4 (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

Corrosion Control Treatment Test Loops

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. The U.S. EPA has also offered to provide analytical services to support this investigative effort. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or lytle.darren@epa.gov.

Lead Service Line Verification Sampling

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for samples meeting the criteria for inclusion in the 90th percentile calculation for lead and copper compliance must be completed by a certified laboratory.

Mr. Mike Glasgow

3

October 30, 2015

Customer Household Exposure Assessment

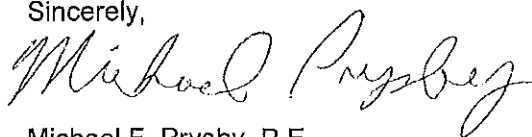
The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis samples meeting the criteria for inclusion in the 90th percentile calculation for compliance purposes for lead and copper must be completed by a certified laboratory.

Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance
517-290-8817

cc: Mr. Brent Wright, City of Flint
Mr. Howard Croft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Darren Lytle, U.S. EPA
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.
Mr. James Henry, Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, October 30, 2015 5:27 PM
To: Shekter Smith, Liane (DEQ)
Subject: Action Steps update

Liane,

Below is an update of the Action Steps completed today:

Action Step 8: Review corrosion control treatment plan and get any EPA comments

Corrosion Control Treatment Operation letter was completed and an electronic copy was sent to the city of Flint and EPA.

Action Step 16: Confirm plumbing assessment and sampling is scheduled for Brownell K-2 STEM Academy and Eisenhower Elementary:

Plumbing assessment was completed at both schools. A briefing of the plumbing layout and sampling details was provided to the sampling teams. Sampling will be conducted at both schools tomorrow morning.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, October 30, 2015 2:35 PM
To: Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: We need to discuss today
Attachments: PO4 Permit (revised dosage).pdf

Jim,

Attached is the revised PO4 dosage that LAN sent us last Tuesday. The revised dosage sheet was included in the permit. The Act 399 Permit application; however, included the original PO4 dosage on the BOD page that was proposed prior to EPA's comments and should have been omitted (my over-sight). We can discuss this later today. The revised dosage should address EPA's concern.

Michael Prysby, P.E.
 District Engineer
 Office of Drinking Water and Municipal Assistance
 517 290-8817

From: Sygo, Jim (DEQ)
Sent: Friday, October 30, 2015 9:06 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: We need to discuss today

Will this be part of the letter coming out today?

From: Kaplan, Robert [<mailto:kaplan.robert@epa.gov>]
Sent: Friday, October 30, 2015 8:58 AM
To: Sygo, Jim (DEQ)
Subject: We need to discuss today

Jim,

In the interests of time, I am sending over a comment from TF discussions directly. There are a few technical concerns about the permit issued to Flint. Could you consider the comment below and let me know your thoughts? It's important to all that we get this nailed down without delaying the feeding of corrosion control. Thanks.

There is a unit "issue" in the section of phosphate dosages. In our phone call the other day, DEQ indicate the units discussed were mg/L as P, when we questioned how much phosphate was being consumed in the Flint system from the Detroit water feed This also came up in a prior discussion on the phone Darren and I had with DEQ about observations of phosphate loss, even within Detroit. The recommendations Darren and I provided for an initial dose of a total amount of PO4 (as PO4), were that the target residual to the estimated theoretical point of diminishing

returns to optimize phosphate (in lieu of having it be determined by actual pilot testing) should be in the 3-4 mg/L as PO₄ neighborhood, closer to 4.

At this time (but not when they change water supplies!) they only need to supplement the PO₄ coming from Detroit. Thus, the pumps to be installed should have the minimum capacity to dose to achieve the 3-4 mg/L as PO₄ level (1-1.3 mg/L as P), with extra capacity to achieve 4-6 mg/L as PO₄ (1.3 to 2 mg/L as P), to assure that they could overcome an estimated system pipe wall demand. So, the design max dosage for the pumps should be 6 mg/L as PO₄ – (the minimum amount of phosphate received from Detroit, in mg/L as PO₄). The minimum would be 3.5 to 5 mg/L as PO₄ – (the maximum amount of phosphate received from Detroit, in mg/L as PO₄).

I seem to recall that we were assured on our phone call the other day that the changes were being made to address our concerns, but that the units were in mg/L as P. Since the conversion factor of P to PO₄ is 3, then clearly, the target residual would be about 1-1.3 mg/L as P, but it looks like the units are PO₄ in this permit. They say the max design dosage would be 1.5 mg/L, which is still a little low, if the units truly are mg/L as P (4.5 mg/L supplement on top of received water). But I'm really confused by the level they say is received from Detroit, because they very explicitly say "as PO₄" in the engineering report that is the basis for the permit request, not as "P."

I'm thinking some water samples should be taken for alkalinity and orthophosphate (or total P, given it's a phosphoric acid product, for convenience of analysis and preservation) and have your R5 laboratory analyze them, so that we can be sure of the phosphate and alkalinity levels.

| Sent from my iPhone

Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal $5,974 \times 0.75$

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 $4,480/97.9913$

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{3-}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{3-}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

Proposed Operating Parameters

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

MFP

	Plant Flow	Dosage as PO_4^{3-} *	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/l	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

Maximum feed rate (Max Flow $\times$ Max Dosage)

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 2.0 \text{ ppm} / 1,408 \text{ g/gal} = 134.30 \text{ gpd Phosphoric Acid}$$

Average feed rate (Avg Flow $\times$ Avg Dosage)

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 26.21 \text{ gpd Phosphoric Acid}$$

Minimum feed rate (Min Flow $\times$ Min Dosage)

$$8 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 13.10 \text{ gpd Phosphoric Acid}$$

Storage Requirements

30 days supply at average flow and dosage = $26.21 \text{ gpd} \times 30 \text{ days} = 786 \text{ gal.}$

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

Four Function Valve
AUTOPRIME™ Liquid End
High Viscosity Liquid End
Low Level Float Switch
Digit-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

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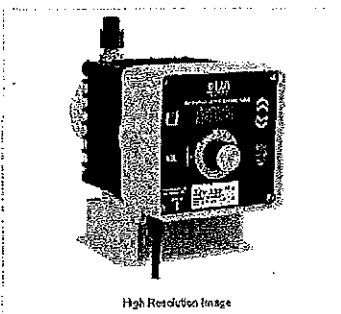
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Series C Chemical Metering Pumps

Series C Chemical Metering Pumps have been an industry standard for over 20 years. Designed for Municipal/Industrial applications, the familiar yellow and black pumps have a rugged, totally enclosed, chemically resistant housing for protection in the harshest environments. Encapsulated electronics and a rigid housing and stroke bracket ensure years of precise, repeatable performance.



High Resolution Image

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- Adjustable stroke frequency and the flexibility of up to 1000:1 turndown ratio
- Manually adjustable stroke length provides accurate pump output adjustment
- NEMA 4X / IP65 enclosures for protection against corrosive environments
- Time tested electronics for reliable, repeatable performance
- Totally encapsulated electronics for protection against moisture and corrosive conditions
- Inputs for low level switch available on certain models
- Models with external pacing for flow proportional applications
- Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)
- *UL, *CUL, NSF 50, NSF 61, *CE Certifications

Control Codes:

- 1 - Dual Manual Control (speed and stroke length)
- 7 - Pulse Input / Dual Manual Control
- 9 - Pulse/Analog Input / Dual Manual Control

Output Codes with standard liquid end	
Max Capacity:	Max Pressure:
*CX0 - 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
*CX1 - 2.5 GPH (9.5 l/h)	150 psi (10.3 Bar)
*CX2 - 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 - 8.0 GPH (30.3 l/h)	80 psi (4.1 Bar)
*CX4 - 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 - 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 - 10.0 GPH (38.0 l/h)	80 psi (5.5 Bar)
C78 - 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MEP

Rennaker, Joanne (DEQ)

From: Sygo, Jim (DEQ)
Sent: Friday, October 30, 2015 9:06 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: We need to discuss today

Will this be part of the letter coming out today?

From: Kaplan, Robert [<mailto:kaplan.robert@epa.gov>]
Sent: Friday, October 30, 2015 8:58 AM
To: Sygo, Jim (DEQ)
Subject: We need to discuss today

Jim,

In the interests of time, I am sending over a comment from TF discussions directly. There are a few technical concerns about the permit issued to Flint. Could you consider the comment below and let me know your thoughts? It's important to all that we get this nailed down without delaying the feeding of corrosion control. Thanks.

There is a unit "issue" in the section of phosphate dosages. In our phone call the other day, DEQ indicate the units discussed were mg/L as P, when we questioned how much phosphate was being consumed in the Flint system from the Detroit water feed. This also came up in a prior discussion on the phone Darren and I had with DEQ about observations of phosphate loss, even within Detroit. The recommendations Darren and I provided for an initial dose of a total amount of PO₄ (as PO₄), were that the target residual to the estimated theoretical point of diminishing returns to optimize phosphate (in lieu of having it be determined by actual pilot testing) should be in the 3-4 mg/L as PO₄ neighborhood, closer to 4.

At this time (but not when they change water supplies!) they only need to supplement the PO₄ coming from Detroit. Thus, the pumps to be installed should have the minimum capacity to dose to achieve the 3-4 mg/L as PO₄ level (1-1.3 mg/L as P), with extra capacity to achieve 4-6 mg/L as PO₄ (1.3 to 2 mg/L as P), to assure that they could overcome an estimated system pipe wall demand. So, the design max dosage for the pumps should be 6 mg/L as PO₄ – (the minimum amount of phosphate received from Detroit, in mg/L as PO₄). The minimum would be 3.5 to 5 mg/L as PO₄ – (the maximum amount of phosphate received from Detroit, in mg/L as PO₄).

I seem to recall that we were assured on our phone call the other day that the changes were being made to address our concerns, but that the units were in mg/L as P. Since the conversion factor of P to PO₄ is 3, then clearly, the target residual would be about 1-1.3 mg/L as P, but it looks like the units are PO₄ in this permit. They say the max design dosage would be 1.5 mg/L, which is still a little low, if the units truly are mg/L as P (4.5 mg/L supplement on top of received water). But I'm really confused by the level they say is received from Detroit, because they very explicitly say "as PO₄" in the engineering report that is the basis for the permit request, not as "P."

I'm thinking some water samples should be taken for alkalinity and orthophosphate (or total P, given it's a phosphoric acid product, for convenience of analysis and preservation) and have your R5 laboratory analyze them, so that we can be sure of the phosphate and alkalinity levels.

Sent from my iPhone

Rennaker, Joanne (DEQ)

From: Henry, James <jhenry@gchd.us>
Sent: Thursday, October 29, 2015 7:26 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Krisztian, George (DEQ)
Subject: Water

I apologize for the slow responses. I've been pulled in many different directions over the past few days. Working with you and sampling the schools is my priority moving forward and my communications will be more prompt.

Mike, I left you a voicemail yesterday afternoon when I received the message that you left earlier in the day. Sorry my response wasn't sooner.

I'll be at my office by 8am tomorrow and I'd be happy to discuss anything.

George, I have the professional sanitarian staff to collect water at schools. The GCHD financial people calculated \$92/hr to cover costs. That didn't include 1 1/2 overtime pay. I can discuss this further.

I have the yellow copies of water (collection) forms used during our first round of sampling at the schools. I can fax, email or discuss them in detail.

If you need details from discussions between GCHD staff and the school staff during the sampling, I can have my staff to sit in on a conference call.

There seemed to be a lot of discrepancies regarding when/if and how long the fixtures were flushed.

The sanitarian that sampled Freeman Elementary told me that the drinking fountains appeared to have been used prior to him collecting the samples (there was water in the basins). Keep in mind, this was after the schools had prohibited use of the fountains. He told me that he assumed that students were randomly pushing the drinking fountain buttons as they walked by because they were told not to use them.

Steve, you made the expectations clear and detailed what everyone's role was with the first round. Of course some mistakes were expected, but the only consistency with flushing the water fixtures seemed to be the inconsistencies.

For example; The central kitchen was not informed and the fixtures were not flushed previous to our sampling. However; we sampled a prep sink that had not been used that morning, but the kitchen manager couldn't recall the last time it had been used.

I collected the samples at the school admin building and met with Tony Sitko. He wasn't sure, but thought the custodian flushed the drinking fountains and didn't know when they were flushed.

There are many similar experiences that my staff reported back to me. I don't mean this critically and this just confirms that mistakes and will occur regardless of how clear the instructions. I think your approach to limiting the different parties involvement with sampling will help reduce mistakes.

Thank Jim

Sent from my phone

Rennaker, Joanne (DEQ)

From: Sygo, Jim (DEQ)
Sent: Thursday, October 29, 2015 2:37 PM
To: Prysby, Mike (DEQ)
Cc: Krisztian, George (DEQ)
Subject: RE: Act 399 Permit

Thanks All.

From: Prysby, Mike (DEQ)
Sent: Thursday, October 29, 2015 2:26 PM
To: Sygo, Jim (DEQ)
Cc: Krisztian, George (DEQ)
Subject: Act 399 Permit

Jim,

Attached is the DEQ Act 399 construction permit authorizing the city to install the phosphate feed system for corrosion control. We are currently drafting the corrosion control plan letter for the city and a copy of the final letter will be provided.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Thursday, October 29, 2015 2:25 PM
To: Prysby, Mike (DEQ)
Cc: Busch, Stephen (DEQ); Natasha Henderson (nhenderson@cityofflint.com); hcroft@cityofflint.com; Green, Warren; Mike Glasgow (MGLasgow@CityofFlint.com); Brent Wright (bwright@cityofflint.com); Hansen, Jeff
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control
Attachments: LMI Series C Pumps.pdf; NSFPhosAcidSpecs.pdf; PhosAcidSafetyDataSheet.pdf; Flint Phosphate Calculations - Revision 4.pdf

Hi Mike,

I just wanted to follow up on the email below and get your estimation on when the permit will be issued. Are you requiring any additional data before a decision can be made?

The calculation that we developed meets with the requirement of the feed rates as agreed to between your office and the EPA based on the email from Stephen Busch to the EPA on November 22, 2015. The pumps were resized to handle the anticipated Max feed rates requested. We are assuming that since we are using the chemical used by DWSD or corrosion control, we are not required to go thru a study phase.

Additionally, during our review of the email trail with EPA, we noticed that the EPA did recommend that Jar Testing be done to evaluate the impact of the orthophosphate dose on turbidity of the DWSD water. Stephen has also noted that a treatability study will need to be conducted on the KWA water in conjunction with the Flint WTP processes to optimize the corrosion control treatment needed before use in the system.

Does the permit to be issued going to highlight more specific requirements on the duration(s), method(s) and reporting needed for each of the testing required before implementation is allowed into the system?

Your assistance and feedback are greatly appreciated to make sure that our timeline for the introduction of the initial corrosion control into the DWSD water and its future implementation into the KWA Raw feed can be accurately depicted in our discussions with the City and KWA.

Thank you very much for your continued support.

Samir F. Matta, PE
 Team Leader



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& Newnam, Inc.**
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1311 South Linden Road, Suite B • Flint, MI 48532
 2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
 D 517.819.2367 C 517.819.2367
www.lan-inc.com • sfmatta@lan-inc.com

From: Matta, Samir
Sent: Tuesday, October 27, 2015 4:12 PM
To: prysbym@michigan.gov

Cc: Brent Wright (bwright@cityofflint.com); Mike Glasgow (MGlasgow@CityofFlint.com)
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

I have included the updated calculations, Proposed Pump Cut Sheet as well as the MSDS and the fact sheet for the chemical to be used.

Please let me know if this satisfy your needs to issue the permit.

Thanks.

Samir F. Matta, PE
Team Leader



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& Newnam, Inc.**
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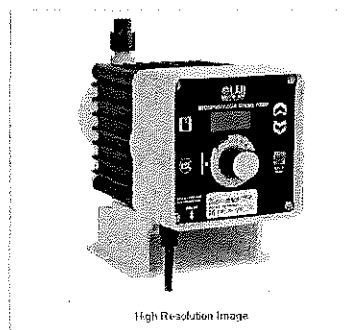
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Series C Chemical Metering Pumps

Series C Chemical Metering Pumps

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- Models with external pacing for flow proportional applications
- Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)
- *UL, *CUL, NSF 50, NSF 61, *CE Certifications

Control Codes:

- 1 - Dual Manual Control (speed and stroke length)
- 7 - Pulse Input / Dual Manual Control
- 9 - Pulse/Analog Input / Dual Manual Control

Output Codes with standard liquid end	
Max Capacity:	Max Pressure:
*CX0 - 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
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*CX2 - 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 - 8.0 GPH (30.3 l/h)	60 psi (4.1 Bar)
*CX4 - 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 - 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 - 10.0 GPH (38.0 l/h)	80 psi (5.5 Bar)
C78 - 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

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AUTOPRIME™ Liquid End
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Low Level Float Switch
Digi-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

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WL Performance
Products LP

PRODUCT DATA SHEET

PRODUCT: Phosphoric Acid, 75%

NSF

GRADE: Technical

CODE: 750

GENERAL DESCRIPTION: Clear colorless liquid with no foreign odor

FORMULA: H_3PO_4

MOLECULAR WEIGHT: 98.0

CAS NO.: 7664-38-2

DATE EFFECTIVE: November 5, 2005

CHARACTERISTICS

SPECIFICATION LIMITS

Specific Gravity @ 25°/15.5°C	1.574 Minimum
Equivalent H_3PO_4 , %	75.0 Minimum
Equivalent P_2O_5 , %	54.3 Minimum
Color, APHA	20 Maximum

NOTE: Specification Limits are subject to change from time to time. Please contact us for current data sheet.

Plant Location: Carondelet (St. Louis), MO; Carteret, NJ; Lawrence, KS
 Packaging: 3000 gal. tank truck; 14,000 gal. tank cars.
 15 gal.(200 lb.) & 55 gal. (700 lb.) plastic drums (nonreturnable)
 Labeling Requirements: Product Label and DOT CORROSIVE label required by law.
 Shipping Classification: 1. Single package of 5000 lbs. or more:
 Phosphoric Acid
 CORROSIVE MATERIAL, UN 1805, RQ
 STCC4930248
 2. Single package of less than 5000 lbs.:
 Phosphoric Acid
 CORROSIVE MATERIAL, UN 1805
 STCC4930248

Distributed By: PVS NOLWOOD CHEMICALS, INC. 10900 Harper Avenue Detroit, MI. 48213 (313) 925-0300	
PVS ITEM #	PVS TECH DATA #
10495	10495

Handling Precautions:

NOT FOR FOOD OR DRUG USE. CORROSIVE TO MILD STEEL. DANGER! CAUSES BURNS TO EYES AND SKIN. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: If in eyes or on skin, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

IN CASE OF SPILL OR LEAK: Contain spill or leak to prevent discharge to environment. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

This Product Data Sheet is subject to the terms and conditions on the reverse side hereof.

CONTROLLED DOCUMENT
IF STAMPED IN RED

PHOSPHORIC ACID , 75%; TECHNICAL GRADE

Key Properties:

- Phosphoric acid is relatively non-volatile and stable at elevated temperatures; it is a much milder acid than sulfuric, nitric, or hydrochloric acids.
- Heavy, viscous liquid, 13.1 to 13.2 lbs./gal.
- Remains liquid at very low temperatures: Freezing point, -18°C (0.5°F)
- Shelf-life -- 24 months

Applications:

- Bonding agent for refractory materials
- Industrial and institutional cleaning and sanitizing products
- Liquid fertilizers
- Aluminum bright-dipping
- Metal treating and phosphatizing
- Flameproofing agent
- Catalyst in chemical processes
- Effluent treatment
- Animal feed supplement
- Potable Water Treatment: ICL Performance Products LP Phosphoric Acid, 75%, conforms to the requirements of ANSI / NSF Standard 60; used for corrosion and scale control.
Maximum Use Level = 13 mg/L.

FOR MORE COMPLETE INFORMATION ON PROPERTIES AND SAFE HANDLING OF THIS MATERIAL, SEE THE ICL PERFORMANCE PRODUCTS LP MATERIAL SAFETY DATA SHEET (MSDS).

NOTICE: Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations or warranties as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information or the product to which Information refers. Nothing contained herein is to be construed as a recommendation to use any product, process, equipment or formulation in conflict with any patent, and ICL Performance Products LP makes no representation or warranty, express or implied, that the use thereof will not infringe any patent. The data set forth herein are based on samples tested and are not guaranteed for all samples or applications. Such data are intended as guides and do not reflect product specifications for any particular product. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OR MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

ICL PERFORMANCE PRODUCTS LP © November, 2005

Corporate Offices:

622 Emerson Road
Suite 500
St. Louis, Missouri 63141
314-983-7500

For order assistance, please call our Customer Service Department Toll Free: 1-800-244-6169



Where needs take us

Safety Data Sheet


RESPONSIBLE CARE®
 OUR COMMITMENT TO SUSTAINABILITY

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: PHOSPHORIC ACID (35% - 95%)
 Reference Number: AST10046
 Date: May 19, 2015
 Synonyms: Emulsi-Phos®; LuminEtch™, LuminEtch™ Ultra, PurEtch®;
 monophosphoric acid; orthophosphoric acid;

Distributed by: PVS NOLWOOD CHEMICALS, INC. 10900 Harper Avenue Detroit, MI 48213 (313) 935-0390	
PVS ITEM #	PVS SDS #
Multi	0484
CONTROLLED DOCUMENT IF STAMPED IN RED	

Use of the substance or preparation

Phosphates and fertilizers, acid cleaners, aluminum brighteners and metal phosphatizing, leather tanning, varnish, synthetic rubber, and water treatment. Food grade is used as an acidulate for cola drinks, yeast nutrient, etc. NSF International certifies phosphoric acid under Standard 60 as an acceptable drinking water treatment chemical.

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
 622 Emerson Road - Suite 500
 St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1 800 424 9300

Outside the USA, including ships at sea, call CHEMTREC's international and maritime telephone number (collect calls accepted): +1 (703) 527-3887.

In Canada call CANUTEC: 1 613 996 6666

General Information: +1 800 244 6169 (Worldwide)

2. HAZARDS IDENTIFICATION

GHS


Danger

GHS05

Skin Corr. 1A H314 Causes severe skin burns and eye damage.
 Eye Dam. 1 H318 Causes serious eye damage.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.
 Rinse skin with water/shower.

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

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P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

3. COMPOSITION/INFORMATION ON INGREDIENTS**Composition**

<u>Substance</u>	<u>CAS No.</u>	<u>%w/w</u>	<u>EINECS No.</u>
Phosphoric Acid	7664-38-2	35 - 95	231-633-2
Water	7732-18-5	5 - 65	231-791-2

4. FIRST AID MEASURES**General**

This material is an acid; treatment is symptomatic and supportive. Phosphoric acid has irritating effects to mucous membranes.

Eye contact

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. If irritation persists, contact an ophthalmologist.

Skin contact

May cause skin irritation. Wash effected area with plenty of soap and water. Get medical attention.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

IF SWALLOWED, do NOT induce vomiting. Give victim 2-4 glasses of water to drink. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

5. FIRE FIGHTING MEASURES**Extinguishing media**

Not combustible. No special requirements.

Unsuitable extinguishing media

Non-combustible. No special requirements.

Exposure hazard

Not combustible. May give off toxic fumes (oxides of phosphorus) in a fire. May react with metals to liberate hydrogen, a flammable gas.

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Material: Phosphoric Acid (35%-95%)

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May 19, 2015

Protective equipment

Firefighters should wear self-contained breathing apparatus & personal protective clothing (PPE).

6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

Avoid unnecessary exposure and remove all material from eyes, skin and clothing. Do not ingest or inhale mists of phosphoric acid.

Environmental precautions

Small quantities: Avoid discharge into the environment

Large quantities: May cause pollution. Avoid discharge into the environment. Note methods for cleaning up in the next section.

Methods for cleaning up

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Neutralize washings with a base such as soda ash or lime. Flush residual spill area with large amounts of water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE**Handling**

Do not get in eyes, on skin, or on clothing.
Avoid breathing mist or vapor.
Do not taste or swallow.

Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drums as thoroughly as possible to facilitate disposal.

For bulk transfer, purge lines with nitrogen to remove residual liquid before disconnect. When unloading bulk vehicles, personnel should wear chemical goggles and rubber or neoprene gloves. All fittings should be properly secured prior to energizing unloading system. Care should be taken to avoid acid contact when disconnecting lines/hoses after unloading.

For bulk storage type 316L stainless is recommended. Glass, polyethylene and FRP (depending on resin used) are satisfactory, steel, aluminum and type 304 stainless are not recommended because of rapid or potential corrosion. Vessels should be vented and operated at ambient conditions. Maintenance heat (hot water preferred) may be used to prevent freezing. Dike area around storage tank with sufficient volume to hold entire tank contents.

Storage

Store in plastic, rubber-lined, or 316L stainless steel tanks designed for Phosphoric Acid. Store drums away from heat and out of direct sunlight. Store in a well-ventilated dry area away from alkalis and most metals. Store above freezing point. Contact with reactive metals, i.e. mild steel and aluminum may generate hydrogen that may form an explosive mixture in storage vessels.

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

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May 19, 2015

For tank inspection, follow manufacturer's recommended safety guidelines (ex. temperature, etc.). In addition, corrosion data for phosphoric acid (ex. Handbook of Corrosion Engineering, McGraw-Hill, 2000) must be followed to match the storage container of choice (ex. stainless, rubber lined, etc.).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Occupational Exposure Limits**

<u>State</u>	<u>Standard</u>	<u>Limit</u>
Australia	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
Austria	Occupation Exposure Limit	MAK 1 mg/m ³ 8-hr
Belgium	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
Denmark	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA
Finland	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
France	Occupation Exposure Limit	VME 1 mg/m ³ VLE 3 mg/m ³
Japan	Occupation Exposure Limit	1 mg/m ³ 8-hr.
United Kingdom	Occupation Exposure Limit	2 mg/m ³ STEL
United States	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL

Respiratory protection

Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment (full face piece recommended) when airborne exposure limits are exceeded (see below). If used, full-face piece replaces the need for face shield and/or chemical goggles. Refer to U.S. OSHA regulations 29 CFR 1910.134 or European Standard EN 149.

Hand/Skin protection

Wear impervious protective gloves and clothing to prevent contact to skin. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean personal protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection

Wear chemical goggles, a face shield, and if necessary, a full face respirator when conditions warrant or exceed the Occupation Exposure Limit. Refer to U.S. OSHA regulations 29 CFR 1910.133 or European Standard EN 166.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

- a) Appearance: Clear, colorless, syrupy liquid
- b) Odor: None
- c) Odor threshold: Undetermined.
- d) pH: (as a 1% solution @ 25 °C) 75%:1.6; 80%:1.6; 85%:1.6; 95%:1.7
- e) Melting point/freezing point: Freezing point °C: 75%:-17.5; 80%:4.6; 85%: 21.1;95%:24.7
- f) Initial boiling point and boiling range: (°C) 75%:135; 80%:144; 85%:154; 95%:202
- g) Flash point: Undetermined
- h) Evaporation rate: Undetermined.
- i) Flammability (solid, gas) : Undetermined.
- j) Upper/lower flammability or explosive limits: Undetermined.
- k) Vapor pressure: (100% acid): 0.0285 mm Hg @ 20 °C
- l) Vapor density: Undetermined.
- m) Relative density: @ 25/15.5 °C: 75%:1.575; 80%:1.633; 85%:1.692; 95%: 1.808
- n) Solubility(ies) : Complete
- o) Partition coefficient: n-octanol/water: Undetermined.

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

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May 19, 2015

- p) Auto-ignition temperature: Undetermined.
- q) Decomposition temperature: Undetermined.
- r) Viscosity: @ 25 °C 75%:12; 80%:17; 85%:23; 95%:55

Chemical Formula: H_3PO_4

	<u>75%</u>	<u>80%</u>	<u>85%</u>	<u>95%</u>
% Equivalent H_3PO_4 :	75.1	80.35	85.5	95.0
Kg/l @ 25 °C	1.57	1.64	1.69	1.81
lb/gallon @ 25 °C	13.17	13.66	14.15	15 - 15.2

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

Incompatible materials

Materials to avoid

Avoid contact with metals (such as mild steel and aluminum), which may liberate flammable hydrogen gas that can produce an explosion in confined vessels. Avoid contact with materials such as sulfides and sulfites, which could release toxic gases. Be cautious in mixing with strong bases because high heat of reaction can generate steam.

Hazardous decomposition

Phosphorus oxides may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

Phosphoric Acid 75%

Oral - rat LD₅₀: 4,400 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 3,160 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 80%

Oral - rat LD₅₀: 4,200 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 3,160 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 85%

Oral - rat LD₅₀: 3,500 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 1,260 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): corrosive

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

Page 6 of 7

May 19, 2015

The results of single exposure tests indicate that these concentrations of Phosphoric Acid are slightly toxic orally and no more than slightly toxic after skin application. Following a 24-hour exposure, irreversible eye and skin damage occurred at all tested concentrations of Phosphoric Acid.

Phosphoric Acid has produced no genetic changes in standard tests using bacterial cells.

Additional Information

This material is severely corrosive to steel based on DOT, 49 CFR criteria.

Phosphoric Acid has a low vapor pressure at room temperature and is not expected to present a significant inhalation hazard under ambient conditions. Phosphoric Acid can, however, be irritating to the respiratory tract if inhaled as a mist or if the material is vaporized. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) for Phosphoric Acid. For further information on this material, please refer to the current edition of the Documentation of The Threshold Limit Values and Biological Exposure Indices.

12. ECOLOGICAL INFORMATION**Environmental toxicity**

Phosphoric acid is practically nontoxic to one species of freshwater fish. No toxicity data was located for other freshwater species, algae, or *Daphnia magna* in a search of the available scientific literature.

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

96-hr. LC₅₀ Mosquitofish: 138 mg/L, practically nontoxic

Environmental Fate

No specific biodegradation test data was located in a search of the available scientific literature. It was reported in the literature that while acidity of this material may be reduced readily in natural waters, the phosphate may persist indefinitely.

13. DISPOSAL CONSIDERATIONS

This material when discarded is a hazardous waste as defined by the U.S. Resource Conservation and Recovery Act (RCRA), 40 CFR 261.22, due to its characteristic of corrosivity, EPA hazardous waste number D002. Best Demonstrated Available Treatment (BDAT) as defined by RCRA for D002 characteristic wastes is DEACTIVATION plus meet 40 CFR 268.48 (Universal Treatment Standards) for non-CWA/non-CWA equivalent/non-Class I SDWA systems. Dispose of in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

IMDG/UN	UN 1805, Phosphoric acid, solution, 8, III
ICAO/IATA	UN 1805, Phosphoric acid, solution, 8, III
RID/ADR	UN 1805, Phosphoric acid, solution, 8, III
Canadian TDG	UN 1805, Phosphoric acid, solution, 8, III *
US DOT	UN 1805, Phosphoric acid, solution, 8, III *

*Reportable Quantity/ Reportable Limit (RQ/RL):

Canadian: Regulated limit (RL) for packages greater than or equal to 230 kg

U.S. DOT: Reportable quantity (RQ) for packages greater than or equal to 5,000 lb

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

Page 7 of 7

May 19, 2015

15. REGULATORY INFORMATION**Chemical Inventory**

USA TSCA	Listed	Australia	Listed
Canada DSL	Listed	Korea	Listed
EC	Listed	Philippines	Listed
Japan	Listed	China	Listed

Additional information

WHMIS Classification: D2 (B) - Materials Causing Other Toxic Effects
E - Corrosive Material

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	Not Applicable
Section 313 Toxic Chemical(s):	Not Applicable

CERCLA Reportable Quantity: 5,000 lbs. of phosphoric acid

Release of 5,000 lbs. or more of this product into the environment in a 24-hour period requires notification to the U.S. National Response Center (800-424-8802 or 202-426-2675). Since local, state, and federal laws vary; consult your attorney or appropriate regulatory officials for information relating to spill reporting.

FDA: Food grades of phosphoric acid are sanctioned as Generally Recognized as Safe (GRAS) by the U.S. Food and Drug Administration and is codified in 21 CFR 182.1073.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	<u>Health</u>	<u>Fire</u>	<u>Reactivity</u>	<u>Additional Information</u>
Suggested NFPA Rating	3	0	0	
Suggested HMIS Rating	3	0	0	H H = Splash goggles, gloves (nitrile rubber recommended), synthetic apron, dust & vapor respirator

Reason for revision: Revised section 1 and 9.

Supersedes MSDS dated: May 2, 2013

Responsible Care ® is a registered trademark of the American Chemistry Council.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

AST10046.4090

Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal $5,974 \times 0.75$

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 $4,480/97.9913$

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{3-}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{3-}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

Proposed Operating Parameters

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

	Plant Flow	Dosage as PO_4^{3-} *	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/l	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

Maximum feed rate (Max Flow $\times$ Max Dosage)

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 2.0 \text{ ppm} / 1,408 \text{ g/gal} = 134.30 \text{ gpd Phosphoric Acid}$$

Average feed rate (Avg Flow $\times$ Avg Dosage)

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 26.21 \text{ gpd Phosphoric Acid}$$

Minimum feed rate (Min Flow $\times$ Min Dosage)

$$8 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 13.10 \text{ gpd Phosphoric Acid}$$

Storage Requirements

30 days supply at average flow and dosage = $26.21 \text{ gpd} \times 30 \text{ days} = 786 \text{ gal}$.

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, October 29, 2015 2:26 PM
To: Sygo, Jim (DEQ)
Cc: Krisztian, George (DEQ)
Subject: Act 399 Permit
Attachments: PO4 Permit.pdf

Jim,

Attached is the DEQ Act 399 construction permit authorizing the city to install the phosphate feed system for corrosion control. We are currently drafting the corrosion control plan letter for the city and a copy of the final letter will be provided.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151104 OCT 28 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537		
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment 4 Corrosion Control	4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENT QUALITY

cc:

DEQ
 RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

Issued by:

Reviewed by:

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project entails installation of phosphate feed systems at both Control Station #2 (CS#2) and Pump Station #4 (PS#4). Feed at CS#2 will provide the ability to add phosphate for corrosion control to finished water supplied from the Detroit Water & Sewer Department (DWSD). Feed at PS#4 will provide the ability to add phosphate to finished water to supply from either the Flint River or Lake Huron via the Karegondi Water Authority (KWA). Both feed systems are temporary systems until the planned filter transfer pump station is constructed. A permanent phosphate feed system will be constructed as part of that contract.

The feed rate will be proportionally controlled based on the water flow rate and will be tied to the existing SCADA system. See attached basis of design for more detailed information.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.	
7. Design engineer's name, engineering firm, address, phone number, and email address: Jeremy Nakashima, PE Lockwood, Andrews and Newnam, Inc. 1311 South Linden Rd, Suite B Flint, MI 48532 jnnakashima@lan-inc.com	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☒ Engineering firm listed in Box 7. ☐ Other - name, address, and phone number listed below.
9. Is a basis of design attached? ☒ YES ☐ NO If no, briefly explain why a basis of design is not needed.	
10. Are sealed and signed engineering plans attached? ☒ YES ☐ NO If no, briefly explain why engineering plans are not needed.	
11. Are sealed and signed construction specifications attached? ☒ YES ☐ NO If specifications are not attached, they need to be on file at DEQ.	
12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed? ☒ YES ☐ NO If no, explain which deviations were made and why.	
13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved? ☒ YES ☐ NO If no, describe what coatings, additives or materials did not meet the applicable standard and why.	
14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.) ☒ YES ☐ NO If no, explain how access will be obtained.	
15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451? ☐ YES ☒ NO If yes, a wetland permit must be obtained.	
16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules? ☐ YES ☒ NO If yes, a flood plain permit must be obtained.	
17. Is the project construction activity within 500 feet of a lake, reservoir, or stream? ☐ YES ☒ NO If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐ YES ☒ NO
 If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?
☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.
☒ NO: Describe why activity is not regulated:
 Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?
☐ YES ☒ NO
 If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?
☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION		
I, <u>BRENT F. WRIGHT</u> (print)	(name), acting as the <u>PLANT SUPERVISOR</u> (print)	(title/position) for
<u>CITY OF FLINT WATER PLANT</u> (print)	(entity owning proposed facilities) certify that this project has	
been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.		
<u>[Signature]</u> Signature*	<u>10-16-2015</u> Date	<u>(810) 787-4537</u> Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 4 Corrosion Control

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application all customers
- C. Total number of service connections ultimately served by entire project all customers
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|---------------------------|
| 1. Initial design average day flow (mgd) | <u>18.3</u> |
| 2. Initial design maximum day flow (mgd) | <u>25.4</u> |
| 3. Total design average day flow (mgd) | <u>24.0</u> |
| 4. Total design maximum day flow (mgd) | <u>36.0</u> |
| 5. Required fire flows: ⁽¹⁾ | _____ gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
|------------------------|

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

City of Flint

Phase II, Segment 4 Corrosion Control

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that initially there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal. Phosphoric acid will be stored in delivered totes and will be placed with containment pallets for dual containment.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.



**Lockwood, Andrews
& Newnam, Inc.**

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

Est. 1936

AUSTIN, TX
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MILPITAS, CA
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WACO, TX

☐ UPS ☐ DELIVERY SERVICE ☐ REGULAR MAIL
☐ FEDEX ☐ HAND DELIVER ☐ PICK-UP
☒ OTHER Extranet(To PM)

To: Michael Prysby		Date: 10-16-13	
Company: MDEQ		Project Number: 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications ☐ Reports ☐ Submittal Data ☐ Proposal ☐ As Noted		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature	

Quantity	Description
3	Full Set of Plans for Ph2-Seg4 Corrosion Control
1	Act 399 Permit Application
1	11x17 Set of Plan for Ph2-Seg4 Corrosion Control

Remarks

These plans have been modified slightly from the set electronically submitted last night.

We look forward to your comments and approval.

Thanks.

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532
TEL 810.820.2682
FAX 810.820.2703
www.lan-inc.com

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matla, PE

Rennaker, Joanne (DEQ)

From: gdn2@aol.com
Sent: Thursday, October 29, 2015 1:38 PM
To: hcroft@cityofflint.com; Amy.Hovey@mail.house.gov; aleavitt@senatedems.org; achubb@cityofflint.com; bwright@cityofflint.com; lytle.darren@epa.gov; dwalling@cityofflint.com; donna.cole@genesys.org; Dykema, Linda D. (DHHS); Wells, Eden (DHHS); edwardsm@vt.edu; Krisztian, George (DEQ); jhenry@gchd.us; jgaskin@unitedwaygenesee.org; jlorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; KEVIN.KEANE@cmsenergy.com; ksmith@flint.org; larry.koehler@mcc.edu; dr.laura2@gmail.com; LawrenceR@mottchc.org; reynolds@mottchc.org; mglasgow@cityofflint.com; schock.michael@epa.gov; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); MVALACAK@gchd.us; nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; skammer@cityofflint.com; s.mcelmurry@wayne.edu; Busch, Stephen (DEQ); Thompson, Sheryl D. (DHHS); jwgreen@lan-inc.com
Subject: Re: NOTICE_November Meeting Adjustment

Hi Howard,

I am unable to make the meeting on Monday, November 9th. I have patients scheduled at that time. Wednesdays are much better for my schedule.

Thank you,

Gerald Natzke DO (GCMS representative)

-----Original Message-----

From: Howard Croft

To: Amy Hovey ; Andy Leavitt ; Anthony Chubb ; Brent Wright ; Darren Lytle ; Dayne Walling ; donna. cole ; dykemal ; Eden Wells (DHHS) ; edwardsm ; George Krisztian (DEQ) ; Gerald (Jed) Natzke ; Howard Croft ; James Henry ; Jamie Gaskin ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kevin J. Keane ; Kirk Smith ; larry.koehler ; Laura Sullivan ; Lawrence Reynolds ; Lawrence Reynolds ; Michael Glasgow ; Schock, Michael ; Michael Wright ; Mike Lane ; Mike Prysby (DEQ) ; MVALACAK ; Natasha Henderson ; Norb Birchmeier ; Pete Levine ; Robert Bincsik ; rosejo ; Russell Hudson ; Samir Matta ; Sean Kammer ; Shawn Patrick McElmurry ; Stephen Busch (DEQ) ; thompsons2 ; Warren Green

Sent: Wed, Oct 28, 2015 10:54 pm

Subject: NOTICE_November Meeting Adjustment

Technical Advisory Team,

We have a request to reschedule the next meeting for **Monday November 9th at 2:00 pm**. This would allow our EPA representatives their best opportunity to be present at the meeting and I believe that would be a significant benefit to the team especially considering the technical nature of the next meeting.

I know this is short notice but please check your schedules to see if you can attend and plan for this final adjustment. We will still hold the meeting at Flint City Hall at 2:00 pm in the same location as the last meeting and I will have an agenda ready as part of next weeks update.

I will also check on the link to our test map and will make sure that it is working on Thursday.

Thank you,

--
Howard Croft

Public Works Director

City of Flint
1101 S. Saginaw Street
Flint, MI 48502
PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, October 29, 2015 10:10 AM
To: nhenderson@cityofflint.com
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: City of Flint Revised Monitoring Schedule October 2015
Attachments: SCAN1146.pdf; 2015 Flint revised schedule-Det.pdf

Good Morning Natasha, it was brought to my attention you asked to be copied on all correspondence regarding the drinking water in the City of Flint, this was after we sent a revised monitoring schedule now that the City is receiving water from Detroit. So, attached is a copy of the letter and revised schedule. I have updated our database to make sure you are included in future correspondence.

thank you,

Adam Rosenthal, EQA
MDEQ – Office of Drinking Water and Municipal Assistance
Lansing District – Constitution Hall 1SW
PO Box 30242
Lansing, MI 48909
517-284-6644
fax: 517-241-3571

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 22, 2015

Mr. Brent Wright
City Of Flint – D.P.W
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Revised Drinking Water Monitoring Schedule – 2015
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for remainder of calendar year 2015 outlining the minimum requirements for your public water supply. Your schedule has been revised based on the City's change in source of its drinking water from the treatment of the Flint River utilizing the City's Water Treatment Plant to the Great Lakes Water Authority/Detroit Water and Sewerage Department. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "WSSN" (water supply serial number), the "Site Code," and "County" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the Department of Environmental Quality Laboratory, you can order bottles by calling 517-335-8184. Be certain of the United States Environmental Protection Agency sampling and analysis method requirements for hold times.

Monthly Operation Report (MOR) Requirements:

The City shall submit MORs as required under Administrative Rule 1502 (R325.11502). Please note required coliform bacteria monitoring results and associated chlorine residual monitoring shall be submitted to the department within the first 10 days following the end of the required monthly monitoring period. In addition, monthly operation reports shall be submitted to the department during the month following the month for which the monthly operation report was prepared.

Mr. Brent Wright

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October 22, 2015

Disinfection By-Product Sample Siting Plans:

The City of Flint shall continue routine standard monitoring of disinfection by-products, according to your Disinfection & Disinfectants By-Product (DDBP) plan which identifies 8 sites for routine quarterly monitoring.

Lead and Copper Monitoring Requirements and Site Sample Pool

Please note distribution system monitoring for water quality parameters (WQPs) continues at the expanded set of 25 sites per quarter. Lead and copper monitoring in accordance with the requirements of Administrative Rule 710a (R325.10710a) is being required for the 6 month period between January 1, 2016 and June 30, 2016. The City must ensure its sample site pool is large enough to collect the number of lead and copper tap samples required. All sites from which first draw samples are collected shall be selected from the pool of targeted sampling sites.

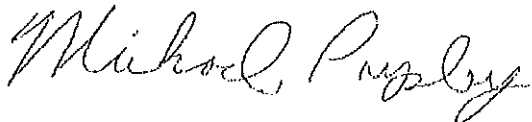
The City shall also conduct additional operational monitoring to demonstrate the effectiveness of corrosion control treatment.

Record Keeping:

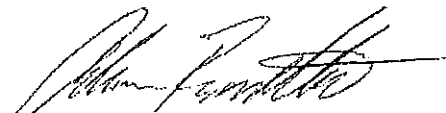
The City shall maintain all monitoring records in accordance with all applicable requirements under the Administrative Rules including Rule 720a (R325.10720a), Rule 1506 (R325.11506), and Rule 1507 (R325.11507).

The Michigan Safe Drinking Water Act requires certain reports to be submitted to this office each year. Please remember that cross connection reports and annual pumpage reports are due by March 31, and the **Consumer Confidence Report** is due by July 1.

Also enclosed is the document "2015 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us using the information below.



Michael F. Prysby, P.E., District Engineer
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-290-8817



Adam Rosenthal, EQA
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-284-6644

Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint
Genesee County Health Department

2015 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

Collect samples early in the monitoring period. This schedule reflects your expected routine monitoring and is subject to change. To receive credit for monitoring, include the **WSSN**, **Site Code**, and **County** on your request for analysis form. Collect Bacteriological and Automated Partial Chemistry samples close to the shipping time and send overnight delivery. Send all sample results to your Department of Environmental Quality (DEQ) district office unless you use the DEQ laboratory. Test codes, sample units, and costs are listed to help you complete the DEQ laboratory form. Prices are subject to change without notice. The DEQ laboratory is closed on state holidays.

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	If serving chlorinated water, measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$130.00	36HA	CXHA
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	60/6 months	Between 1/1 and 6/30/2016	DIST	\$26.00	36CC	CCUB