
From: Sygo, Jim (DEQ)
Sent: Friday, March 22, 2013 10:02 AM
To: Shekter Smith, Liane (DEQ)
Cc: Willard, Veronica (DEQ); Smith, Laura (DEQ); Creal, William (DEQ)
Subject: RE: Flint Scenarios

I talked to Bill and want him to look at it relative to the impacts on DWSD. I agree the technical elements are within Drinking Water.

From: Shekter Smith, Liane (DEQ)
Sent: Friday, March 22, 2013 8:43 AM
To: Sygo, Jim (DEQ)
Cc: Willard, Veronica (DEQ); Smith, Laura (DEQ); Creal, William (DEQ)
Subject: RE: Flint Scenarios

Jim - Looks like this is only related to drinking water.

Bill - ODWMA will respond. No need to circulate to WRD staff.

From: Sygo, Jim (DEQ)
Sent: Thursday, March 21, 2013 6:07 PM
To: Shekter Smith, Liane (DEQ); Creal, William (DEQ)
Cc: Willard, Veronica (DEQ); Smith, Laura (DEQ)
Subject: FW: Flint Scenarios
Importance: High

Bill and Liane,

Please have the attached documents reviewed and comments provided relative to the City of Flint water supply needs and relative to the impacts that are possible to the Detroit System.

Treasury needs an assessment as to the need for the alternative water supply and it's impacts so they can provide input to the financial managers.

We need comments by next week and will likely meet with the Director on Thursday.

Bring in whatever staff you need for the review and please try to have your assessments by Wednesday morning.

Sorry for the tight time frame but this one is out of my hands. I will also be looking at the report.

From: Wyant, Dan (DEQ)
Sent: Thursday, March 21, 2013 5:10 PM
To: Sygo, Jim (DEQ)
Cc: Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ)
Subject: FW: Flint Scenarios
Importance: High

Jim,

Director asked that you review and coordinate this with Liane Shekter Smith and/or Bill Creal and their appropriate staff. Director also asked that I schedule an internal meeting with you and staff on this for next week. After your review, please let me know who you want in the meeting. It needs to happen on Tuesday, Wednesday or Thursday of next week.

Thank you.

Mlary Beth

From: Stibitz, Brom (Treasury)
Sent: Thursday, March 21, 2013 5:00 PM
To: Wyant, Dan (DEQ)
Cc: Dillon, Andy (Treasury)
Subject: FW: Flint Scenarios

Andy asked that I pass this information along to you.

From: Sygo, Jim (DEQ)
Sent: Tuesday, March 26, 2013 8:36 AM
To: Thelen, Mary Beth (DEQ)
Subject: RE: March 25 Highlights Paragraph

DWMA is conducting a review of the KWA water line report prepared for the Treasurer's Office to assist in making a decision on the water line. WRD will also assist in evaluating the impact on DWSD..

Deputy Director Sygo has been assigned as the Point Person for the Emergency Financial Manager appointed to Detroit. Any calls received should be referred to him.

A letter has gone out last week on the petroleum Coke piles that are in temporary storage along the Detroit River. A fugitive dust plan has been requested to be submitted by the beginning of May.

DD Sygo will be attending the C3 event for Hemlock Semiconductor in Hemlock, Michigan on 3/27.

The Department will be signing on to an Amicus Brief that supports the Water Compacts. Recently Texas has challenged the authority of the of these entities to control water withdrawals.

From: Thelen, Mary Beth (DEQ)
Sent: Tuesday, March 26, 2013 7:47 AM
To: DEQ-EXE-MGMT-TEAM
Cc: DEQ-EXE-MGMT-TEAM-Secretaries
Subject: March 25 Highlights Paragraph

Dear SMT:

Since we ran out of time at the SMT meeting due to the presentations given, if you wish to have something that you wanted to report and place in the March 25 highlights, please send me your paragraph or few sentences by Wednesday noon. I have received a few already. Thank you.

Mary Beth

Mary Beth Thelen
Executive Management Assistant to the Director
Department of Environmental Quality
Thelenm2@michigan.gov
517-373-7917 or 517-241-7390

From: Sygo, Jim (DEQ)
Sent: Tuesday, April 16, 2013 9:59 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)
Cc: 'Shekter-Smith, Liane (DEQ)' (SHEKTERL@michigan.gov); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ)
Subject: FW: KWA and City of Flint
Attachments: KWA and City of Flint.pdf; ATT00001.htm

Steve, Mike and Richard,

Please take a look at DWSD's last best offer to the City of Flint and provide your collective perspective to the Director through Liane by the end of the week. Copy me in as well. I'll be out of the office but would like to know if you think this is worth considering.

Thank you for your expedited review.

From: Wyant, Dan (DEQ)
Sent: Tuesday, April 16, 2013 6:52 AM
To: Sygo, Jim (DEQ)
Subject: FW: KWA and City of Flint

Jim,

Liane is out of the office today, Can you forward this directly to her staff that worked on this with us.

Dan Wyant, Director
 Department of Environmental Quality
 517-373-7917

From: Wyant, Dan (DEQ)
Sent: Tuesday, April 16, 2013 6:51 AM
To: Sygo, Jim (DEQ); Creal, William (DEQ); Shekter Smith, Liane (DEQ)
Cc: Anderson, Madhu (DEQ)
Subject: FW: KWA and City of Flint

Bill and Liane,

Can you have your staff's take a quick look at this and let me know today if they think this changes their thoughts and comments to me last week.

Dan Wyant, Director
 Department of Environmental Quality
 517-373-7917

From: Dillon, Andy (Treasury)
Sent: Monday, April 15, 2013 7:55 PM
To: Wyant, Dan (DEQ); Dennis Muchmore; Roberts, John (GOV)
Cc: Stibitz, Brom (Treasury); Saxton, Thomas (Treasury)
Subject: Fwd: KWA and City of Flint

FYI

Dan, any thoughts re the attached?

We gave dwsd until today to put best offer on table. Flint is to get back to us tmrw. I want to make sure their expected rejection is made in good faith.

Sent from my iPad

Begin forwarded message

From: "Debra Ragland" <dragland@dwsd.org>
To: "ekurtz@cityofflint.com" <ekurtz@cityofflint.com>
Cc: "jwright@co.genesee.mi.us" <jwright@co.genesee.mi.us>, "Dillon, Andy (Treasury)" <DillonA2@michigan.gov>, "James Fausone" <fausone@dwsd.org>, "orrk@detroitmi.gov" <orrk@detroitmi.gov>, "Sue McCormick" <mccormick@dwsd.org>
Subject: KWA and City of Flint

Please see attached on behalf of Sue F. McCormick.

Faxed copy forwarded to Mayor Dayne Walling and Jeff Wright.

From: Sygo, Jim (DEQ)
Sent: Tuesday, April 16, 2013 10:01 AM
To: Creal, William (DEQ)
Subject: RE: KWA and City of Flint

Bill copy me in on your analysis as well.

From: Creal, William (DEQ)
Sent: Tuesday, April 16, 2013 8:01 AM
To: Wyant, Dan (DEQ); Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ)
Cc: Anderson, Madhu (DEQ)
Subject: RE: KWA and City of Flint

Will do.

From: Wyant, Dan (DEQ)
Sent: Tuesday, April 16, 2013 6:51 AM
To: Sygo, Jim (DEQ); Creal, William (DEQ); Shekter Smith, Liane (DEQ)
Cc: Anderson, Madhu (DEQ)
Subject: FW: KWA and City of Flint

Bill and Liane,

Can you have your staff's take a quick look at this and let me know today if they think this changes their thoughts and comments to me last week.

Dan Wyant, Director
 Department of Environmental Quality
 517-373-7917

From: Dillon, Andy (Treasury)
Sent: Monday, April 15, 2013 7:55 PM
To: Wyant, Dan (DEQ); Dennis Muchmore; Roberts, John (GOV)
Cc: Stibitz, Brom (Treasury); Saxton, Thomas (Treasury)
Subject: Fwd: KWA and City of Flint

FYI

Dan, any thoughts re the attached?

We gave dwsd until today to put best offer on table. Flint is to get back to us tmrw. I want to make sure their expected rejection is made in good faith.

Sent from my iPad

Begin forwarded message

From: "Debra Ragland" <dragland@dwdsd.org>
To: "ekurtz@cityofflint.com" <ekurtz@cityofflint.com>
Cc: "jwright@co.genesee.mi.us" <jwright@co.genesee.mi.us>, "Dillon, Andy (Treasury)"

<DillonA2@michigan.gov>, "James Fausone" <fausone@dwsd.org>, "orrk@detroitmi.gov"
<orrk@detroitmi.gov>, "Sue McCormick" <mccormick@dwsd.org>

Subject: KWA and City of Flint

Please see attached on behalf of Sue F. McCormick.

Faxed copy forwarded to Mayor Dayne Walling and Jeff Wright.

From: Sygo, Jim (DEQ)
Sent: Wednesday, September 24, 2014 6:17 PM
To: Thelen, Mary Beth (DEQ)
Subject: Accepted: Flint Drinking Water Issues

From: Sygo, Jim (DEQ)
Sent: Monday, January 05, 2015 9:43 PM
To: Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ)
Cc: Shaler, Karen (DEQ)
Subject: Fwd: Media Inquiry - City of Flint
Attachments: TTHM Media Inquirey Jan 5, 2015.doc; ATT00001.htm

In case you haven't seen this.

Sent from my iPhone

Begin forwarded message:

From: "Shekter Smith, Liane (DEQ)" <SHEKTERL@michigan.gov>
Date: January 5, 2015 at 4:56:28 PM EST
To: "Sygo, Jim (DEQ)" <Svgoj@michigan.gov>
Cc: "Shaler, Karen (DEQ)" <SHALERK@michigan.gov>
Subject: FW: Media Inquiry - City of Flint

FYI

From: Prysby, Mike (DEQ)
Sent: Monday, January 05, 2015 4:47 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Willard, Veronica (DEQ)
Subject: Media Inquiry - City of Flint

Ron Fonger from the Flint Journal contacted me today with questions pertaining to the Flint TTHM violation notice. Attached is a summary of the inquiry.

I will also provide a write-up tomorrow morning concerning the phone interview with NBC 25...

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

**TTHM Media Inquiry
January 5, 2015**

I received a media inquiry from Ron Fonger of the Flint Journal concerning the TTHM MCL violation in the city of Flint. Ron was provided with a copy of our December 16, 2014 Violation Notice letter to the city of Flint concerning the TTHM violation. Ron was also provided with a draft press release on Jan 4th concerning measures being taken by the city to address the TTHM violation. Below is a summary of the questions asked by Ron and my response.

- **How common are TTHMS in Michigan and are there other systems in violation?**

TTHMs are found in systems that disinfect with CL2 due to the reaction between CL2 and naturally occurring organic compounds (total organic carbon - TOC) in the raw water. There is one other system (customer supply of Saginaw) that has exceeded the TTHM standard. Since this is outside of my district, I do not know the details of the violation.

- **How widespread are the high TTHM levels in Flint?**

TTHM is monitored at 8 locations throughout the city. Compliance is based on a Locational Running Annual Average (LRAA) meaning that any one location will put the city out of compliance with the TTHM standard if that location fails to meet the standard based on the running annual average (RAA) of 4 quarters of monitoring. The LRAA was exceeded in just 3 quarters at two of the eight locations due to high TTHM concentrations at these locations(May and August quarters).

- **What level of concern should city residents have?**

TTHMs are a health concern associated with long-term (chronic) exposure as opposed to other contaminants such as pathogenic organisms (fecal coliform, giardia, crypto, etc.) which are short-term concerns...ie...immediate impact to public health. The potential health effects provided in the notice are possible with long term exposure over a significant portion of the person's lifespan. Consumption of drinking water with TTHMs at this

concentration does not pose an immediate threat to public health.

- The most recent test results (November) appear much better; what do residents need to know for the future?

The decline in TTHMS is two-fold. First, the decline is the result of the city taking pro-active measures in collaboration with the DEQ to address the TTHM concentrations that includes: optimizing current treatment, shortening residence time in water storage reservoirs, optimizing ozone treatment, and improving operation of the distribution system (flushing, repairing valves, and opening valves to eliminate areas of stagnation).

Next, seasonal variation also contributed to the reduction in TTHM levels as the TOC loading from the Flint River watershed diminishes during the winter months. T

The city is also pursuing additional treatment options (enhanced coagulation) to help remove TOC and filter cleaning to reduce CL2 demand. Hydraulic modeling of the distribution system will also be performed to further optimize operation of the system reservoirs and pumping stations aimed at reducing stagnation. These efforts combined with steps already taken are expected to dampen higher TTHM levels during the 2015 summer months.

- There has been some criticism regarding the timing of the notice....ie...why weren't residents notified during earlier when high TTHM results were being obtained?

The city was not in the position to provide a notice since the results obtained last summer did not place the city into a violation status. Also, since TTHMs pose a health concern with term-term exposureand in anticipation of exceeding the standard by the end of 2014, the city elected to pursue a proactive approach towards reducing TTHMs (treatment & distribution operation). The city also worked with the DEQ in this effort along with preparation and distribution of the mandatory public notice within 30 days of the start of the violation (December 1, 2014). I also explained how the LRAA is calculated and why the first two quarters did not constitute a violation.

- What triggers the TTHM violation?

As mentioned above, if exceedance of the LRAA (based on 4 quarters of results) occurs at ANY of the eight sampling locations the city is in violation. The LRAA can also be exceeded in less than four quarters (based on a 4-quarter calculation) if the concentration is high enough.

From: Sygo, Jim (DEQ)
Sent: Thursday, April 16, 2015 10:36 AM
To: Wagner, Robert (DEQ); Erickson, Susan (DEQ)
Subject: Fwd: R5 Regional Administrator to visit Flint area this Friday

FYI

Sent from my iPhone

Begin forwarded message:

From: "Shekter Smith, Liane (DEQ)" <SHEKTERL@michigan.gov>
Date: April 16, 2015 at 10:01:22 AM EDT
To: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
Cc: "Shaler, Karen (DEQ)" <SHALERK@michigan.gov>, "Devereaux, Tracy Jo (DEQ)" <DEVEREAUXT@michigan.gov>
Subject: FW: R5 Regional Administrator to visit Flint area this Friday

Keeping you in the loop.

From: Busch, Stephen (DEQ)
Sent: Wednesday, April 15, 2015 1:25 PM
To: Thelen, Mary Beth (DEQ); Wurfel, Brad (DEQ)
Cc: Shekter Smith, Liane (DEQ)
Subject: FW: R5 Regional Administrator to visit Flint area this Friday
Importance: High

Mary Beth and Brad,

Please see the note below. I assume but wasn't sure who from the executive office will be participating in this visit by EPA to Flint, but as noted drinking water is likely to come up and while the Administrator has been briefed by regional EPA staff they likely don't have all the details that we do.

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

From: Crooks, Jennifer [mailto:crooks.jennifer@epa.gov]
Sent: Wednesday, April 15, 2015 1:10 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Poy, Thomas; Kuefler, Janet
Subject: R5 Regional Administrator to visit Flint area this Friday

Our Regional Administrator, Susan Hedman, will be traveling to Flint this Friday to discuss Brownfields. Of course, we think the discussion will more likely be about the drinking water. Tom Poy and I briefed the RA yesterday on the pertinent issues. I will forward the briefing when it is final. Please don't hesitate to contact Tom Poy (312-886-5991; poy.thomas@epa.gov) or myself if you have questions.

Jennifer
(312.886.0244)

From: Sygo, Jim (DEQ)
Sent: Thursday, August 06, 2015 12:16 PM
To: Shekter Smith, Liane (DEQ)
Subject: Flint

Forgot to mention to you that there was a death attributed to Legionnaires in Flint this week.

This will liky turn up the heat.

Sent from my iPhone

From: Sygo, Jim (DEQ)
Sent: Monday, October 05, 2015 9:04 AM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Subject: Fwd: Who's to blame for Flint's water crisis? Virginia Tech researcher points the finger at MDEQ | Michigan Radio

FYI

Sent from my iPhone

Begin forwarded message:

From: <SygoJ@michigan.gov>
Date: October 3, 2015 at 1:04:59 PM EDT
To: Brad Wurfel <WurfelB@michigan.gov>
Subject: Who's to blame for Flint's water crisis? Virginia Tech researcher points the finger at MDEQ | Michigan Radio

In case you didn't hear this.

<http://michiganradio.org/post/whos-blame-flints-water-crisis-virginia-tech-researcher-points-finger-mdeq#stream/0>

Sent from my iPhone

From: Sygo, Jim (DEQ)
Sent: Monday, October 05, 2015 11:31 AM
To: Busch, Stephen (DEQ)
Subject: FW: Contact at MDHHS/LHD level for water testing planning and process

FYI

From: Wyant, Dan (DEQ)
Sent: Monday, October 05, 2015 11:23 AM
To: Sygo, Jim (DEQ); Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)
Subject: Fwd: Contact at MDHHS/LHD level for water testing planning and process

Sent from my iPhone

Begin forwarded message:

From: "Wells, Eden (DHHS)" <WellsE3@michigan.gov>
Date: October 5, 2015 at 8:47:33 AM EDT
To: "Wyant, Dan (DEQ)" <WyantD@michigan.gov>
Cc: "Miller, Corinne (DHHS)" <MillerC39@michigan.gov>, "Dykema, Linda D. (DHHS)" <DykemaL@michigan.gov>
Subject: FW: Contact at MDHHS/LHD level for water testing planning and process

Good morning, Dan,

Contact for lead testing in water here at MDHHS should be Linda Dykema, but she is on AL today- will try to get a LHD contact for you-
 E.

From: Miller, Corinne (DHHS)
Sent: Monday, October 05, 2015 8:41 AM
To: Wells, Eden (DHHS); Moran, Susan (DHHS); Miller, Mark (DHHS)
Cc: Hertel, Elizabeth (DHHS); Lasher, GERALYN (DHHS)
Subject: RE: Contact at MDHHS/LHD level for water testing planning and process

It should be Linda Dykema. Both EPA and DEQ would want her involvement.

From: Wells, Eden (DHHS)
Sent: Sunday, October 04, 2015 5:11 PM
To: Moran, Susan (DHHS); Miller, Mark (DHHS); Miller, Corinne (DHHS)
Cc: Hertel, Elizabeth (DHHS); Lasher, GERALYN (DHHS)
Subject: Contact at MDHHS/LHD level for water testing planning and process

Hi there,

I just got off the phone with Dan Wyant, as he needed UMSPH contact for the Mayor's TA panel. He was wondering who will be the contacts with DEQ and EPA as water testing proceeds (such as t schools, etc) at either MDHHS and LHD.

I am assuming that Linda Dykema would be the one for us (and she was on their organizing call)- Corinne agree?

Mark, are you planning on talking to Mark Valacek tomorrow---I heard you were out, so wondered if you wanted myself or Sue to do so.

Actually, i think there will be a number of issues to coordinate with him tomorrow, so forgive me if I am getting in the middle, just wanted to relay the questions Dan had.

Eden

From: Sygo, Jim (DEQ)
Sent: Tuesday, October 06, 2015 3:59 PM
To: Krisztian, George (DNRE); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ)
Subject: Lead
Attachments: Lead.docx

The attached came off of the Mass. page.

Blood levels in children are not significantly impacted by lead levels in water that are 15 ppb or lower

presented a risk for bottle-fed infants.

The lead studies discussed above exclusively assessed lead in water, and tap water was the only source considered as the cause of the increased BLL. One landmark U.S. observational study conducted during the 1990s studied 183 urban children aged 12–31 months (37%, 12–18 months; 31%, 18–24 months; 33%, 24–31 months) (57). Of these children, 63% had BLLs <10 µg/dL, 20% had BLLs of 10–14 µg/dL, 8% had BLLs of 15–19 µg/dL, and 3% had BLLs ≥20 µg/dL. The study evaluated lead in home foundation perimeter soils, potable water, paint, and house dust. Lead-contaminated house dust was the major contributor to BLLs ≥10 µg/dL. However, the study reported that although lead-contaminated water had a statistically significant effect on children's BLLs after adjusting for other sources of lead exposure, no statistically significant contribution for drinking water could be discerned at levels below the current EPA action level of 15 ppb (57). Lead dust as a primary source of lead for children with increased BLLs was further demonstrated in a subsequent pooled analysis of 12 studies; floor dust lead levels as low as 5 µg/ft² were associated with 5% of enrolled children having a BLL ≥10 µg/dL (58).

From: Sygo, Jim (DEQ)
Sent: Monday, October 12, 2015 11:40 AM
To: Shekter Smith, Liane (DEQ)

Attorney-Client Privilege

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 12, 2015 10:30 AM
To: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Manning, Peter (AG); Hart, Nancy (AG)
Cc: Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)

Attorney-Client Privilege

From: DEQ-LogLetter
Sent: Monday, October 12, 2015 10:21 AM
To: Shaler, Karen (DEQ)
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ); Devereaux, Tracy Jo (DEQ); Manning, Peter (AG); Hart, Nancy (AG)

Attorney-Client Privilege

From: Sygo, Jim (DEQ)
Sent: Thursday, October 15, 2015 2:38 PM
To: McDonald, Paul (DEQ)
Subject: RE: Contract for Water

I'm open the rest of the afternoon now Paul. Come down anytime.

From: McDonald, Paul (DEQ)
Sent: Thursday, October 15, 2015 1:09 PM
To: Sygo, Jim (DEQ)
Subject: RE: Contract for Water

Do you have a moment? I'd like to pop down and discuss but can draft an e-mail if that doesn't work for you.

From: Sygo, Jim (DEQ)
Sent: Thursday, October 15, 2015 1:01 PM
To: McDonald, Paul (DEQ) <mcdonaldp@michigan.gov>
Cc: Krisztian, George (DEQ) <krisztian@michigan.gov>; Thelen, Mary Beth (DEQ) <THELENM2@michigan.gov>; Shaler, Karen (DEQ) <SHALERK@michigan.gov>
Subject: FW: Contract for Water

Paul,
FYI, we will need to establish a process for the disbursement of the money to Flint.

From: Workman, Wayne (TREASURY)
Sent: Thursday, October 15, 2015 11:31 AM
To: Dayne Walling; Muchmore, Dennis (GOV)
Cc: Natasha Henderson; Sygo, Jim (DEQ); Wyant, Dan (DEQ); Saxton, Thomas (Treasury); Byrne, Randall (Treasury)
Subject: RE: Contract for Water

Mayor, The state appropriation is being made to the DEQ. I have copied Director Wyant and his Chief Deputy Jim Sygo on this. We recommend a conference call with DEQ, Mott and the City to agree on payment procedures. It will be necessary to have a list of expenditure amounts for water and any other equipment, services and supplies that will total up to the \$12,000,000 budget. Treasury will participate and help any way, but it is important DEQ, Mott and the City agree on the process. We can participate in a call today or Friday. Wayne

From: Dayne Walling [<mailto:dwalling@cityofflint.com>]
Sent: Thursday, October 15, 2015 11:02 AM
To: Muchmore, Dennis (GOV) <muchmored@michigan.gov>; Workman, Wayne (TREASURY) <WorkmanW@michigan.gov>
Cc: Natasha Henderson <nhenderson@cityofflint.com>
Subject: Contract for Water

Gentlemen, I have asked City Administrator Natasha Henderson to reach out to you at Treasury Wayne about the contract for Detroit water. The Mott Foundation has questions about payments and ensuring all parties are contributing to the monthly costs as well as how an escrow fund would work to ensure funds are solely for this purpose. Time is of the essence as you know and the City is prepared to do all things necessary for the water to

begin flowing as quickly as possible as we have agreed. Thanks for your tremendous efforts on this and we look forward to finalizing the agreements hopefully today or tomorrow.

—

Dayne Walling
Mayor, City of Flint
City Hall, 1101 S. Saginaw St.
Flint, MI 48502
810-766-7346

mayor@cityofflint.com

www.cityofflint.com

follow me on twitter at <http://twitter.com/mayorwalling>

From: Sygo, Jim (DEQ)
Sent: Friday, October 16, 2015 10:21 AM
To: chester@millercanfield.com
Subject: FW: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint
Attachments: Request for Disclosure of Official Files; FW: FOIA request from Phelps - 6422-15; RE: FOIA request from Phelps - 6422-15; 6422 - EXEC, ODWMA, WRD + Lansing - due: 9/15/15; Attached FOIA Request and \$50 Check; Request for Disclosure of Official Files

Steve this is the only record that exists indicating that the records requested do not exist. According to Maggie's note, the Rep has not returned her calls.

From: Shaler, Karen (DEQ)
Sent: Tuesday, October 13, 2015 9:15 AM
To: Sygo, Jim (DEQ)
Subject: FW: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

FYI, since I see you need to attend the 11:15 am meeting today on this issue.

From: Shaler, Karen (DEQ)
Sent: Tuesday, October 13, 2015 9:12 AM
To: Wyant, Dan (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)
Cc: Thelen, Mary Beth (DEQ)
Subject: RE: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

Executive Division did not have any records for Rep. Phelps' FOIA request; only ODWMA did. Attached are e-mails about the handling of his FOIA request. This FOIA was assigned to EXE, ODWMA, and WRD; and Rep. Phelps was notified of that via the 1st attached e-mail of September 10. The 4th attached e-mail contains the 3 documents that ODWMA Lansing District (Jo Anne Rennaker) e-mailed on September 30 to Rep. Phelps at no charge. The last attached e-mail is the denial e-mail that Susan Vorce sent on September 28 indicating that EXE and WRD don't have any records, and I was unaware of her e-mail until October 1 when I checked the U drive folder where our FOIA office saves the PDF of FOIA requests and e-mails to the requesters.

Here is a link to the "DEQ FOIA Information" that's on our home page: <http://www.michigan.gov/deq/0,4561,7-135---357782---,00.html>

The 2nd to last link on that page is a draft of the new DEQ Policy and Procedure No. 01-006A, which is for the public to know how to make a FOIA request and how it's processed in DEQ.

Please let me know if you need anything else. Thanks.

From: Pallone, Maggie (DEQ)
Sent: Tuesday, October 13, 2015 7:38 AM
To: Shaler, Karen (DEQ)
Cc: Thelen, Mary Beth (DEQ); Wurfel, Brad (DEQ)
Subject: FW: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

Karen-

Can you help Brad and Dan on what documents were provided to Phelps? From both ODWMA and EXE?

Thanks,

Maggie

From: Wurfel, Brad (DEQ)

Sent: Monday, October 12, 2015 9:35 PM

To: Pallone, Maggie (DEQ) <PalloneM@michigan.gov>

Subject: Fwd: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

Need you on this. Probably will help to have copies of whatever we shared and I want to be sure I know what I know. Thanks.

b

Sent from my iPhone

Begin forwarded message:

From: "Wurfel, Sara (GOV)" <Wurfels@michigan.gov>

To: "Wyant, Dan (DEQ)" <WyantD@michigan.gov>, "Pallone, Maggie (DEQ)" <PalloneM@michigan.gov>, "Wurfel, Brad (DEQ)" <WurfelB@michigan.gov>, "Tommasulo, Karen (DEQ)" <TommasuloK@michigan.gov>

Subject: FW: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

Need to make sure I understand the full background and story on this.

From: Gary Ridley [mailto:GRIDLEY@mlive.com]

Sent: Monday, October 12, 2015 1:39 PM

To: Bitely, Andrea (AG) <BitelyA@michigan.gov>; Wurfel, Sara (GOV) <Wurfels@michigan.gov>

Subject: Comment sought on Rep. Phelps Files Suit Against State of Michigan, City of Flint

Hi,

I wanted to see if the state had any comment in response to this lawsuit.

Thanks.

--

Gary Ridley | The Flint Journal-MLive Media Group | 810-280-9516 | gridley@mlive.com<<mailto:gridley@mlive.com>>

From: Rosemary Jones [mailto:RJones@house.mi.gov]

Sent: Monday, October 12, 2015 1:33 PM

To: Rosemary Jones

Subject: Rep. Phelps Files Suit Against State of Michigan, City of Flint

FOR IMMEDIATE RELEASE

Monday, Oct. 12, 2015

Contact: Rep. Phil Phelps
Phone: (517) 373-7515

Rep. Phelps Files Suit Against State of Michigan, City of Flint
State, city failed to release documents sought in FOIA request

LANSING — State Representative Phil Phelps (D-Flushing) announced earlier today that he is filing suit against the state of Michigan and the city of Flint to force them to release public documents he requested last month under the Freedom of Information Act (FOIA).

“It’s an absolute shame that I have to file suit to force our government to comply with the law,” Phelps said. “I was shocked at their response, because prior to receiving the denials, officials from both the city and state had told me that not only did documents exist, but they would be happy to share them with me.”

On Sept. 4 of this year, Phelps requested that the city and state turn over all documents and emails regarding the permit and application process that Flint’s emergency manager was required to complete before the Michigan Department of Environmental Quality gave the go ahead to the city to start using the Flint River as its source of drinking water. Late last month, the state and the city both denied Phelps’ request, saying that no such documents exist.

In March and April of 2014, officials from both the city and state were also quoted in several articles on Mlive.com, making comments about the permit application process for Flint to switch its source of drinking water from Detroit’s system to the Flint River.

“I want to know what these officials knew about the safety and quality of the river water before the switch was made. Judging by their response and recent actions, it almost seems they knew a lot more than they are letting on to,” Phelps said. “Flint residents deserve better than this, they deserve to know the truth about the decisions that were made, and if I have to fight this in court to get the truth, so be it.”

###

Rosie Jones
Deputy Press Secretary
Michigan House Democrats
O: 517.373.3731
C: PPI
housedems.com

From: DEQFOIA
Sent: Thursday, September 10, 2015 11:59 AM
To: Phillip Phelps (pphelps277@yahoo.com)
Subject: Request for Disclosure of Official Files

Mr. Phil Phelps
819 Main Street, Unit A
Flushing, MI 48433

Dear Mr. Phelps:

SUBJECT: Request for Disclosure of Official Files

This notice is issued in response to your request for information under the Freedom of Information Act, 1976 PA 442, as amended (FOIA), received on September 8, 2015. You have requested the following information: "Any waivers, permits or applications to use the Flint River as a source for water and/or drinking water for the City of Flint, etc." (FOIA 6422-15).

Your request will be forwarded to the **Executive Division, Office of Drinking Water and Municipal Assistance, and Water Resources Division**

Due to time constraints and limited resources, it is necessary to issue a 10-business day extension until **September 29, 2015**, as permitted under Section 5(2)(d) of the FOIA.

Susan Vorce, FOIA Coordinator
Department of Environmental Quality
800-662-9278

The DEQ strives to continually improve its customer service to FOIA requestors. To provide input for improvements to the FOIA process, please complete this survey: <https://www.surveymonkey.com/s/foia090615>

From: Shaler, Karen (DEQ)
Sent: Tuesday, September 29, 2015 6:29 PM
To: DEQFOIA;Vorce, Susan (DEQ);Busch, Stephen (DEQ);Rennaker, Joanne (DEQ)
Cc: DEQ-RMD-FOIA;Devereaux, Tracy Jo (DEQ);Thelen, Mary Beth (DEQ);Feuerstein, Heather (DEQ)
Subject: FW: FOIA request from Phelps - 6422-15
Attachments: 6422.pdf; RE: Check; 6422 - EXEC, ODWMA, WRD + Lansing - due: 9/15/15

FYI, Maggie Pallone previously told me that she spoke with Rep. Phelps about his attached FOIA request. He told her that he would get back with her about whether or not he wanted to cancel his request. Maggie has since contacted his office 3 additional times to follow up, but no one has contacted her. That being said, late this afternoon, Maggie said to go ahead and treat his request as a FOIA after all.

In addition, today Sylvia Renteria sent his \$50 FOIA good faith deposit check to the Cashier's Office to be deposited due to the year-end closing deadline to deposit checks and is having it credited to ODWMA (see attached).

It turns out that the Executive Division does not have any of the requested records. However, ODWMA has three documents in the attached e-mail from Tracy Jo Devereaux that are responsive according to my conversation today with Steve Busch, so ODWMA will need to provide Rep. Phelps with those documents, apply the cost against the \$50 check, and either have a refund issued if the total cost is less than \$50 or invoice Rep. Phelps for any additional amount over \$50.

Please let me know if you need anything else from me. Thanks.

Karen

From: Vorce, Susan (DEQ)
Sent: Tuesday, September 15, 2015 11:31 AM
To: Pallone, Maggie (DEQ); Copen, Leigh (DEQ); Shaler, Karen (DEQ)
Cc: Schinderle, Jack (DEQ); Edlin, Karen (DEQ)
Subject: FW: FOIA request from Phelps - 6422-15

Maggie:

The attached FOIA request has already been entered into the FOIA database.

However, I did not realize the requester was a State Representative.

Karen Shaler and JoAnne Rennaker (ODWMA-Lansing District) are working on this FOIA request.

Please contact me or Karen if you have any questions.

--Susan

Susan Vorce, FOIA Coordinator
 Department of Environmental Quality

517-284-6889 or 800-662-9278

voices@michigan.gov

From: Renteria, Sylvia (DEQ)
Sent: Tuesday, September 29, 2015 1:51 PM
To: Shaler, Karen (DEQ)
Subject: RE: Check

The check is being credited to ODWMA.

Sylvia Renteria
Financial Specialist
Michigan Department of Environmental Quality
6th Floor Constitution Hall
T: 517-284-5006
F: 517-241-7428

From: Shaler, Karen (DEQ)
Sent: Tuesday, September 29, 2015 1:47 PM
To: Renteria, Sylvia (DEQ)
Subject: RE: Check

OK. Is this \$50 being credited to Exec. Div. or ODWMA for this FOIA?

From: Renteria, Sylvia (DEQ)
Sent: Tuesday, September 29, 2015 8:27 AM
To: Shaler, Karen (DEQ)
Subject: Check

Hi Karen!

I am going to send the check to be deposited. I don't want to close the year with an outstanding check.

Thanks,
Sylvia

Sylvia Renteria
Financial Specialist
Michigan Department of Environmental Quality
6th Floor Constitution Hall
T: 517-284-5006
F: 517-241-7428

From: Devereaux, Tracy Jo (DEQ)
Sent: Thursday, September 24, 2015 5:01 PM
To: Shaler, Karen (DEQ); DEQFOIA
Cc: DEQ-RMD-FOIA
Subject: 6422 - EXEC, ODWMA, WRD + Lansing - due: 9/15/15
Attachments: 02310_Flint_BaselineForm.pdf; ATT00001.htm; BaselineLetterSW - 03 14 07.pdf; ATT00002.htm; BaselineQA - 03 12 07.pdf; ATT00003.htm

Attached are all the documents ODWMA has pertaining to the subject line FOIA request. Our understanding is that the documents are to be reviewed in Executive Division before going anywhere else.

From: Busch, Stephen (DEQ)
Sent: Thursday, September 24, 2015 4:58 PM
To: Devereaux, Tracy Jo (DEQ)
Subject: Fwd: Flint Baseline Info

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

Sent from my iPhone

Begin forwarded message:

From: "Philip, Kris (DEQ)" <PHILIPK@michigan.gov>
Date: September 23, 2015 at 10:24:15 AM EDT
To: "Busch, Stephen (DEQ)" <BUSCH5@michigan.gov>
Cc: "Rennaker, Joanne (DEQ)" <RENNAKERJ@michigan.gov>
Subject: Flint Baseline Info



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

March 13, 2007

Dear Water Supply Professional:

**SUBJECT: Confirmation of "Baseline Capacity" for Surface Water Sources
RESPONSE REQUIRED BY APRIL 1, 2007**

This correspondence has been sent to confirm the "baseline capacity" of your surface water source(s). Baseline capacity is a critical component of new laws regulating water withdrawals passed by the Michigan legislature in February 2006. The enclosed "Question and Answer" (Q&A) document further explains this new legislation, its impact on you, and why responding to this letter is to your advantage.

To assign a baseline capacity for community water supplies, the MDEQ must establish the design withdrawal capacity as of May 29, 2006. For surface water sources, the design withdrawal capacity is the sum or total capacity of all pumps capable of withdrawing water from a surface water source. This capacity is the sum of the rated or design capacity of your low service or intake pumps without regard to hydraulic limitations or pump inefficiencies.

Enclosed please find a report on the sum or total rated capacity of your low service or intake pumps currently on record at the MDEQ. Please review this capacity, indicate your agreement or provide necessary corrections, and return the signed form to the MDEQ by April 1, 2007. A single response is all that is necessary, so you may wish to consult with your water system staff before returning your reply.

There is no scenario under the new legislation where confirming your baseline capacity will not be to your advantage. In fact, failure to do so may result in the MDEQ using annual pumpage data instead of available withdrawal capacity to determine your baseline. This default approach will result in a lower baseline capacity being established for your system.

In closing, the MDEQ wants to ensure the low service or intake pump capacity data it has on record is accurate and appropriate for establishing your baseline capacity from surface water source(s). If you have specific questions about the capacity listed on the enclosed report, please contact your district engineer. If you have questions regarding the new water withdrawal legislation, please read the enclosed Q&A document where you will find additional resources and contact information. Thank you for your cooperation.

Sincerely,

James K. Cleland, P.E., Chief
Lansing Operations Division
Water Bureau

Enclosures

cc: Operator in Charge

Questions and Answers Regarding New Water Withdrawal Legislation & Baseline Capacity

What is the purpose of the new water withdrawal legislation and why do we need to establish baseline capacity?

The new laws governing large quantity water withdrawals expanded upon water use and reporting requirements for large quantity water users to further assist in management of Michigan's water resources. The laws amended Parts 327 and 328 of the Natural Resources and Environmental Protection Act, and the Safe Drinking Water Act. The amendments redefined the requirements for water use registration and reporting, established environmental standards for assessment of new or increased large quantity water withdrawals, and set in place permit requirements for new large quantity water withdrawals of over 2 million gallons per day for ground water or inland surface water sources and 5 million gallons per day for surface water sources drawing from the Great Lakes or connecting waters.

What is a Large Quantity Withdrawal?

A large quantity withdrawal is defined as 1 or more cumulative total withdrawals of over 100,000 gallons per day (gpd) as an average in any 30-day period supplying a common distribution system, an amount approximately equal to new or additional capacity of 70 gallons per minute (gpm).

What is Baseline Capacity?

Baseline capacity is defined as the withdrawal capacity reported to the MDEQ by the person making a large quantity water withdrawal in the April 1, 2007 annual report of water use. For public water supplies the baseline capacity is the total designed withdrawal capacity as approved by the MDEQ under the Michigan Safe Drinking Water Act. For groundwater systems, the approved withdrawal capacity of your well(s) is the rated capacity of the well pump(s), not the capacity at which the pump(s) may be operating due to well inefficiencies. This capacity may include standby wells equipped with pumps that are maintained for emergency use. For surface water systems, the approved withdrawal capacity is the rated capacities of low service or intake pumps regardless of hydraulic limitations or pump inefficiencies. Only pumping equipment in place and operational within 90 days of the effective date of the legislation, which was February 28, 2006, can be included in the baseline capacity. If the above referenced capacity information is not reported and is otherwise unavailable, baseline capacity defaults to the maximum reported water use reported to the MDEQ for the years 2002 to 2005.

Why is establishing a baseline capacity important to you?

Under the new legislation, all new or increased "large quantity withdrawals" will be subject to evaluation under the new environmental standards. By legislative mandate, a new or increased large quantity withdrawal references a system's baseline capacity, or the existing capacity of the large quantity water user as a point of reference. All existing large quantity withdrawals that can be documented by the April 1, 2007 deadline for reporting are "grandfathered."

(continued on reverse)

How might an inaccurate or no baseline capacity affect your public water supply?

The answer to this question is best exemplified by citing a hypothetical example. Suppose a water supply system (not necessarily a public water supply) is operating with an average water use of 1.2 million gallons per day (MGD) and a peak water use reported to the department in 2004 of 1.6 MGD. However, the sum of capacities for the system's well pumps is 1800 gpm, or 2.6 MGD. Unfortunately, the system fails to notify the MDEQ of their existing well pump capacity. Under the law, 1.6 MGD becomes the grandfathered baseline capacity instead of 2.6 MGD.

Subsequently, the system increases their water use and later reports a water use to the MDEQ of 1.8 MGD, or a 200,000 gpd increase. The system is now subject to application of the new environmental standards adopted in passage of the legislation. Had they reported their baseline capacity, an increase in use of up to 1.0 MGD would have been exempt from application of the new environmental standards.

To give another example, a system using surface water has a peak daily demand reported on June 30, 2004 of 22 MGD. At the water treatment plant, there are 4 low service pumps that may be used to withdraw water from their source. Two of the pumps are rated at 10 MGD. The other 2 pumps have variable frequency motors. One of these pumps can produce up to 10 MGD; the other up to 5 MGD. If the system fails to notify the MDEQ that the total capacity of their low service pumps is 35 MGD, their grandfathered baseline capacity will become 22 MGD. As in the previous example, this system is now subject to the application of the new environmental standards should their water use increase more than 100,000 gpd beyond the 2004 peak demand.

Where can I obtain additional information on the new water use legislation?

Additional information about the new water use and water withdrawal legislation is available on the MDEQ website at <http://www.michigan.gov/deqwateruse>. Specific questions or comments regarding the new legislation should be directed to: Brant Fisher at 517-241-1415 or fisherb@michigan.gov or Ronda Page at 517-241-1380 or pagerc@michigan.gov.

Questions specific to your water supply well capacities should be directed to your MDEQ district office.

From: Shaler, Karen (DEQ)
Sent: Wednesday, September 30, 2015 11:09 AM
To: Rennaker, Joanne (DEQ); DEQFOIA; Vorce, Susan (DEQ); Busch, Stephen (DEQ)
Cc: Devereaux, Tracy Jo (DEQ); Feuerstein, Heather (DEQ); Renteria, Sylvia (DEQ)
Subject: RE: FOIA request from Phelps - 6422-15

As we discussed, yes, please e-mail the three PDF documents to him at pphelps277@yahoo.com as I understand that ODWMA will provide the documents at no charge. FYI, I also spoke with Lori Carter of the Accounting Service Center, who told me the \$50 FOIA deposit check has not yet been processed so once they receive it, she will have it returned to me to be voided and returned to Rep. Phelps. Thanks.

From: Rennaker, Joanne (DEQ)
Sent: Wednesday, September 30, 2015 10:26 AM
To: Shaler, Karen (DEQ); DEQFOIA; Vorce, Susan (DEQ); Busch, Stephen (DEQ)
Cc: Devereaux, Tracy Jo (DEQ)
Subject: RE: FOIA request from Phelps - 6422-15

Good Morning Karen,

Do you want me to e-mail the documents to Representative Phelps?

Jo Anne Rennaker
 Secretary
 Office of Waste Management and Radiological Protection
 Office of Drinking Water and Municipal Assistance
 517-284-6643

From: Shaler, Karen (DEQ)
Sent: Tuesday, September 29, 2015 6:29 PM
To: DEQFOIA; Vorce, Susan (DEQ); Busch, Stephen (DEQ); Rennaker, Joanne (DEQ)
Cc: DEQ-RMD-FOIA; Devereaux, Tracy Jo (DEQ); Thelen, Mary Beth (DEQ); Feuerstein, Heather (DEQ)
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with those documents, apply the cost against the \$50 check, and either have a refund issued if the total cost is less than \$50 or invoice Rep. Phelps for any additional amount over \$50.

Please let me know if you need anything else from me. Thanks.

Karen

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Sent: Tuesday, September 15, 2015 11:31 AM
To: Pallone, Maggie (DEQ); Copen, Leigh (DEQ); Shaler, Karen (DEQ)
Cc: Schinderle, Jack (DEQ); Edlin, Karen (DEQ)
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Maggie:

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However, I did not realize the requester was a State Representative.

Karen Shaler and JoAnne Rennaker (ODWMA-Lansing District) are working on this FOIA request.

Please contact me or Karen if you have any questions.

--Susan

Susan Vorce, FOIA Coordinator
Department of Environmental Quality
517-284-6889 or 800-662-9278
voces@michigan.gov

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Sent: Thursday, September 24, 2015 5:01 PM
To: Shaler, Karen (DEQ); DEQFOIA
Cc: DEQ-RMD-FOIA
Subject: 6422 - EXEC, ODWMA, WRD + Lansing - due: 9/15/15
Attachments: 02310_Flint_BaselineForm.pdf; ATT00001.htm; BaselineLetterSW - 03 14 07.pdf; ATT00002.htm; BaselineQA - 03 12 07.pdf; ATT00003.htm

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To: Devereaux, Tracy Jo (DEQ)
Subject: Fwd: Flint Baseline Info

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Lansing and Jackson District Supervisor
Office of Drinking Water and Municipal Assistance
MDEQ
517-643-2314

Sent from my iPhone

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From: "Philip, Kris (DEQ)" <PHILIPK@michigan.gov>
Date: September 23, 2015 at 10:24:15 AM EDT
To: "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>
Cc: "Rennaker, Joanne (DEQ)" <RENNAKERJ@michigan.gov>
Subject: Flint Baseline Info



COMPLETE AND RETURN THIS FORM TO THE MDEQ BY APRIL 1, 2007.

Listed below is the sum of the rated capacity of all low service or intake pumps the MDEQ has on record capable of withdrawing water from a surface water source as of May 29, 2006. If the capacity is correct, check the box provided. If the total capacity is incorrect, put the correct capacity in the blank to the right of the listed capacity. Finally, complete the signature box and return the form to the MDEQ. Thank you for your cooperation.

WSSN: 02310 FLINT

Check this box if the total capacity listed below is correct.

If the data is incorrect, leave this box blank and make the necessary correction below.



	Capacity on Record	Capacity Correction
Total low service or intake pump capacity:	90 MGD	

Signature of water supply representative:

BRENT F. WRIGHT

Printed Name

OPS & TECH SUPERVISOR

Title

Signature

3-22-07

Date

Please FAX or mail your completed form to:

MDEQ, Water Bureau
Community Drinking Water Unit
PO Box 30273
Lansing, MI 48909-7773

FAX: (517) 241 - 1328



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

March 13, 2007

Dear Water Supply Professional:

**SUBJECT: Confirmation of "Baseline Capacity" for Surface Water Sources
RESPONSE REQUIRED BY APRIL 1, 2007**

This correspondence has been sent to confirm the "baseline capacity" of your surface water source(s). Baseline capacity is a critical component of new laws regulating water withdrawals passed by the Michigan legislature in February 2006. The enclosed "Question and Answer" (Q&A) document further explains this new legislation, its impact on you, and why responding to this letter is to your advantage.

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Enclosed please find a report on the sum or total rated capacity of your low service or intake pumps currently on record at the MDEQ. Please review this capacity, indicate your agreement or provide necessary corrections, and return the signed form to the MDEQ by April 1, 2007. A single response is all that is necessary, so you may wish to consult with your water system staff before returning your reply.

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Sincerely,

James K. Cleland, P.E., Chief
Lansing Operations Division
Water Bureau

Enclosures

cc: Operator in Charge

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Why is establishing a baseline capacity important to you?

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(continued on reverse)

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The answer to this question is best exemplified by citing a hypothetical example. Suppose a water supply system (not necessarily a public water supply) is operating with an average water use of 1.2 million gallons per day (MGD) and a peak water use reported to the department in 2004 of 1.6 MGD. However, the sum of capacities for the system's well pumps is 1800 gpm, or 2.6 MGD. Unfortunately, the system fails to notify the MDEQ of their existing well pump capacity. Under the law, 1.6 MGD becomes the grandfathered baseline capacity instead of 2.6 MGD.

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Where can I obtain additional information on the new water use legislation?

Additional information about the new water use and water withdrawal legislation is available on the MDEQ website at <http://www.michigan.gov/deqwateruse>. Specific questions or comments regarding the new legislation should be directed to: Brant Fisher at 517-241-1415 or fisherb@michigan.gov or Ronda Page at 517-241-1380 or pagerc@michigan.gov.

Questions specific to your water supply well capacities should be directed to your MDEQ district office.

From: DEQFOIA
Sent: Monday, September 28, 2015 11:59 AM
To: Phillip Phelps (pphelps277@yahoo.com)
Subject: Request for Disclosure of Official Files

Mr. Phil Phelps
819 Main Street, Unit A
Flushing, MI 48433

Dear Mr. Phelps:

SUBJECT: Request for Disclosure of Official Files – Executive Division and Water Resources Division

This notice is issued in response to your request for information under the Freedom of Information Act, 1976 PA 442, as amended (FOIA), received on September 8, 2015. You have requested the following information: "Any waivers, permits or applications to use the Flint River as a source for water and/or drinking water for the City of Flint, etc." (FOIA 6422-15).

The purpose of the FOIA is to provide the public with access to existing, nonexempt public records of public bodies. Your request to examine or receive a copy of the documents described above is denied.

To the best of this public body's knowledge, information, and belief, the public record does not exist under the name given by the requester, or by another name reasonably known to the public body.

Under section 10 of the FOIA, the DEQ is obligated to inform you of the following:

- 1) Appeal this decision in writing to the Director of the Department of Environmental Quality, P.O. Box 30473, Lansing, Michigan 48909-7973. The writing must specifically state the word "appeal," and identify the basis for which the disclosure determination should be reversed. The Director of the DEQ, or his/her delegated designee, must respond to the appeal within 10 days of its receipt. Under unusual circumstances, the time for response to the appeal may be extended by 10 business days.
- 2) Commence a civil action in circuit court within 180 days after the date of the final determination to deny the request. If you prevail in such an action, the court is to award reasonable attorney fees, costs, and disbursements, and possible damages.

Susan Vorce, FOIA Coordinator
Department of Environmental Quality
800-662-9278
deqfoia@michigan.gov

The DEQ strives to continually improve its customer service to FOIA requesters. To provide input for improvements to the FOIA process, please complete this survey: <https://www.surveymonkey.com/s/12ap2025>

From: Sygo, Jim (DEQ)
Sent: Friday, October 16, 2015 12:02 PM
To: Dykema, Linda D. (DHHS)
Subject: FW: DRAFT DELIBERATIVE; NOT SUBJECT TO FOIA - final draft
Attachments: draft deliberative Justification of the school daycare drinking water lead level.docx;
TSG IEUBK outputs draft for discussion purposes.pdf

So looking at the model runs it seems to me that you're better off using your money to reduce the exposure of lead in homes and yards first if you have children with elevated levels of lead. Is that correct?

From: Gray, Jennifer (DHHS)
Sent: Friday, October 16, 2015 10:57 AM
To: Groetsch, Kory J. (DHHS); Flaga, Christine (DEQ); Wildfang, Eric (DEQ); Sills, Robert (DEQ); MacKenzie-Taylor, Deb (DEQ)
Cc: Dykema, Linda D. (DHHS); Sygo, Jim (DEQ)
Subject: DRAFT DELIBERATIVE; NOT SUBJECT TO FOIA - final draft

All;

Here is the final draft for your review. Please let me know as soon as possible if you have comments or edits. I would greatly appreciate those by 2 pm, so I'm able to finalize the draft today.

I'm not sure of the MDEQ 1997 park reference. Deb, is there a formal report?

I will add headers to the modeling output sheets and figures.

Thank you,
Jennifer

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Justification of the drinking water no “corrective action” lead level for use in the Flint school and daycare drinking water sample decision tree

The Michigan Department of Health and Human Services (MDHHS) requested that the Toxic Steering Group (TSG) provide endorsement of a health-based drinking water lead levels that would require no “corrective action” to put back into service drinking water faucets and fountains to be used by Flint school and daycare children. Selection of the “corrective actions” was not included in the charge question and is not discussed in this document. A TSG subcommittee was convened to examine this issue. Subcommittee members are Deb Mackenzie-Taylor (Michigan Department of Environmental Quality [MDEQ]), Robert Sills (MDEQ), Eric Wildfang (MDEQ), Jennifer Gray (MDHHS), and Kory Groetsch (MDHHS).

Neither the Centers for Disease Control and Prevention’s Agency for Toxic Substances and Disease Registry (ATSDR) nor the U.S. Environmental Protection Agency (EPA) have derived potency values (e.g. reference dose, minimal risk level) for lead to be used in risk assessment methods. Both agencies have stated that no blood lead level has been found to be safe and precautionary actions to reduce exposure to lead, such as running tapwater briefly before use, should always be followed. Due to the lack of potency values, the EPA developed a biokinetic model for evaluating lead exposure from multiple media. Lead levels in air, soil, house dust, diet, drinking water, and maternal blood are used to estimate geometric mean blood lead levels for a population of children and the probability that a child would be above a specified blood lead level¹. The model results are compared to an EPA population health protection goal for young children exposed to lead at residential properties of 5% or lower risk of a child having a blood level greater than the CDC reference value of 5 µg/dL². The model, however, does not include inputs to account for direct paint chip ingestion².

Use of the EPA’s Integrated Exposure Uptake Biokinetic (IEUBK) Model

The EPA’s Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children version 1.1 Build 11 was used to evaluate exposure to children one year old or younger and children seven years old or younger. Default values were retained unless otherwise noted below. See Table 2-1 in the “User’s Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows[®]” for the listing of all the default values³. Values selected that are more appropriate for a Michigan urban area, Flint, are described briefly below.

Air data

MDEQ performs monitoring for lead in ambient air (as measured in Total Suspended Particulates; lead [TSP]) at a number of fixed stations in Michigan. Some of these monitoring stations (e.g., in Belding, Port Huron, and Vassar) were established to intentionally capture the influence of specific nearby industrial

¹ The modeling output includes the percent of children in a population that are above a specified blood lead level, but that value can also be viewed as the probability (risk) that a certain child would be above the specified blood lead level.

² As stated on the EPA’s Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Integrated Exposure Uptake Biokinetic (IEUBK) Model webpage, found at <http://www2.epa.gov/superfund/lead-superfund-sites-frequent-questions-risk-assessors-integrated-exposure-uptake#mean>.

³ The model itself and documentation, including the user’s guide for the model can be found at <http://www2.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals>.

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emissions, while others were established to provide data reflecting the general ambient air lead levels in urban areas. The TSG Subcommittee reviewed the ambient air monitoring data, focusing on urban ambient air lead data that would be representative of contemporary Flint conditions. The most recent MDEQ annual air monitoring report is for 2014⁴. The summary statistics provided in the MDEQ annual air quality reports include 3-month average (mean) levels, the highest value (24-hour sample), and the 2nd highest value (24-hour sample). The National Ambient Air Quality Standard (NAAQS) for lead (0.15 $\mu\text{g}/\text{m}^3$) has a 3-month averaging time.

The Flint (Whaley Park; 3610 Iowa Ave.) monitor, measuring lead, operated until early 2007. The 2005 calendar quarter arithmetic mean values were 0.008, 0.010, 0.011, and 0.012 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The 2006 calendar quarter arithmetic mean values were 0.005, 0.007, 0.012, and 0.006 $\mu\text{g}/\text{m}^3$. Although Flint data more recent than 2007 are not available, MDEQ staff considered other urban lead monitoring sites to be fairly representative of Flint conditions. Grand Rapids, Allen Park, and Dearborn each had a highest rolling 3-month arithmetic mean lead (TSP) level of 0.01 $\mu\text{g}/\text{m}^3$ in 2013; for 2014, these values were 0.01 $\mu\text{g}/\text{m}^3$ for Grand Rapids and Allen Park and 0.02 $\mu\text{g}/\text{m}^3$ for Dearborn. These data indicate that the IEUBK model default value of 0.1 $\mu\text{g}/\text{m}^3$ is not the most appropriate air lead level for Flint, and support a representative value of 0.01 $\mu\text{g}/\text{m}^3$ for air data model input.

Water consumption

The default drinking water intakes are age-dependent and based on national averages⁵. These were updated to match the mean drinking water intakes (direct and indirect) in Table 3-1 from the U.S. EPA Exposure Factors Handbook: 2011 Edition.

- 0-1 years old - 0.32 liter/day (L/d) (age-adjusted from the values in Table 3-1)
- 1-2 years old - 0.271 L/d
- 2-3 years old - 0.317 L/d
- 3-4 years old - 0.327 L/d (3 to 6 years old in Table 3-1)
- 4-5 years old - 0.327 L/d (3 to 6 years old in Table 3-1)
- 5-6 years old - 0.327 L/d (3 to 6 years old in Table 3-1)
- 6-7 years old - 0.414 L/d (6 to 11 years old in Table 3-1)

Drinking water data for alternate drinking water sources

The alternate drinking water sources used for these modeling runs are listed below with a brief description.

- “Percent of Total Consumed as First Draw” – This was set to 0% as Genesee County issued an Public Health Emergency Advisory⁶ recommending that no one drink the City of Flint water until it has been tested or unless it is being filtered through a filter meeting the National Sanitation Foundation (NSF)/American National Standards Institute (ANSI) standard 53.

⁴ The MDEQ 2014 Annual Air Quality Report can be found at http://www.michigan.gov/documents/deq/deq-aqd-amu-2014_Annual_Air_Quality_Report_492732_7.pdf?20151014123800.

⁵ Per the “User’s Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows[®]”, “The default consumption rates are age-dependent and based on national averages. These consumption rates should be changed only when valid site-specific monitoring data is available.”

⁶ The Genesee County Public Health Emergency Declaration can be found at http://www.gchd.us/docs/public_health_emergency_announcement_10_1_15.pdf.

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- "Concentration of Lead in First Draw ($\mu\text{g/L}$)" – With the "Percent of Total Consumed as First Draw" set to 0%, this value will not alter the model run output so the default of 4 micrograms per liter ($\mu\text{g/L}$ or parts per billion [ppb]) was retained.
- "Concentration of Lead in Flushed ($\mu\text{g/L}$)" – This was set to 1 $\mu\text{g/L}$ (ppb) as filters meeting NSF/ANSI standard 53 are recommended for use in all schools and daycares. The filters distributed remove greater than 99% of the lead and would result in filtered water containing lead levels of approximately 1 $\mu\text{g/L}$ (ppb) or less.
- "Percentage of Total Consumed from Fountains" – This was set to 50%, as children in school and daycare setting spend around eight hours or more in those locations. Eight hours could be expected to be approximately half of their waking hours in a day.
- "Concentration of Lead in Fountain Water ($\mu\text{g/L}$)" – Modeling runs were carried out for every 1 $\mu\text{g/L}$ (ppb) between zero and 15, 30, and 100 $\mu\text{g/L}$ (ppb). Modeling runs for the zero to 15 $\mu\text{g/L}$ (ppb) were carried out to perform a sensitivity analysis to evaluate how a one $\mu\text{g/L}$ (ppb) change in lead water concentrations alters the outputs of the model. The 30 and 100 $\mu\text{g/L}$ (ppb) were included as preliminary representatives of high-end lead levels obtained from school drinking water fountains.

Site-specific soil data

Soil lead levels on residential properties vary greatly⁷. The primary influence is from pre-1978 use of lead paint on the outside of buildings^{8,9,10}. After 1978 lead-paint was banned. In addition, the age of housing^{7,8}, paint condition⁸, and distance from the building¹⁰ can greatly impact the concentration of lead in soil. The soil lead concentrations near the foundation of houses with lead paint are frequently over 1,000 ppm^{8,10,11,12}. Historic vehicle emissions from leaded gasoline are another source of residential soil lead, so distance from road and traffic volume at the time leaded gasoline was in use are also influential factors on residential soil concentrations^{9,10,12}. Other potential influences are fill material (e.g., foundry sand, smelter slag), and/or local industrial emission sources. The highest soil lead concentrations are typically found in urban areas with high population density⁷.

Soil lead data for residential soil in Flint are not currently available. Other Flint park data and relevant residential soil lead studies were reviewed to evaluate appropriate surrogate concentrations for this assessment.

⁷ Datko-Williams, L., A. Wilkie, et al. (2014). "Analysis of U.S. soil lead (Pb) studies from 1970 to 2012." *Science of The Total Environment* **468-469**: 854-863.

⁸ Francek, M. A. (1992). "Soil lead levels in a small town environment: a case study from Mt Pleasant, Michigan." *Environ Pollut* **76**(3): 251-257.

⁹ Francek, M. A., B. Makimaa, et al. (1994). "Small town lead levels: a case study from the homes of pre-schoolers in Mt. Pleasant, Michigan." *Environ Pollut* **84**(2): 159-166.

¹⁰ Schwarz, K., S. T. Pickett, et al. (2012). "The effects of the urban built environment on the spatial distribution of lead in residential soils." *Environ Pollut* **163**: 32-39.

¹¹ Andra, S. S., D. Sarkar, et al. (2006). "Lead in Soils in Paint Contaminated Residential Sites at San Antonio, Texas, and Baltimore, Maryland." *Bulletin of Environmental Contamination and Toxicology* **77**(5): 643-650.

¹² Yesilonis, I. D., R. V. Pouyat, et al. (2008). "Spatial distribution of metals in soils in Baltimore, Maryland: role of native parent material, proximity to major roads, housing age and screening guidelines." *Environ Pollut* **156**(3): 723-731.

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The MDEQ¹³ reported soil lead concentrations from urban parks including Flint. This data set included 12 sample locations from 10 Flint parks. Surface soil samples were collected at 0-2 inches and subsurface samples were collected at 4-6 inches. This dataset may not adequately represent residential soil samples with a lead paint contribution from buildings. Other studies have shown that open spaces may have much lower soil lead concentrations than areas near residential buildings that were built prior to 1978^{10,14}. The geometric mean and geometric mean plus two standard deviation surface soil concentrations (see below) from this Flint park dataset were used for this assessment. The geometric mean plus two standard deviation surface soil concentration represents an upper percentile value that may partially account for the higher soil lead levels expected around buildings with lead paint.

Another data source is from soil samples collected from the Rouge River watershed between 1992 and 2002¹⁵. This dataset was compiled from MDEQ files and Clayton Group Services files for the Rouge River watershed area in southeast Michigan. Although some data is from Part 201 sites, most of the samples were from sites were collected as a result of other regulatory or real estate due diligence requirements. Sites with known industrial metal sources or that had near surface soil with unknown fill material were excluded from the dataset. The dataset included 28 residential sites that had 535 surface soil samples with data reported for lead. The geometric mean value for residential surface soils reported from this study (see below) was used for this assessment.

The current Part 201 residential direct contact risk-based soil level was also used for this assessment for comparison. This value was generated from the IEUBK model using an acceptable blood lead concentration of 10 µg/dL, a drinking water concentration of 4 µg/L (ppb) and a default air concentration used in the model at the time of criteria development.

Soil levels examined in the model runs were:

- 47.5 parts per million (ppm) – based on the geometric mean of 0-2 inch soil concentrations in Flint urban parks¹³.
- 155 ppm – based on the geometric mean + two standard deviations of 0-2 inch soil concentrations in Flint urban parks¹³.
- 160 ppm – based on the geometric mean for residential surface soil from Rouge River watershed¹⁶.
- 400 ppm - the MDEQ Residential Direct Contact Risk-Based Screening Level for soil.

Both the residential soil geometric mean from the Rouge River watershed and the upper percentile from the Flint park data appear to represent the best surrogates for residential soil concentrations in Flint for this assessment. Although not from Flint, the Rouge River watershed residential soil data appears to be a fairly robust data set for urban residential soils in Michigan. The Flint park data upper percentile

¹³ MDEQ 1997 Urban park soil lead data

¹⁴ Zahran, S., H. W. Mielke, et al. (2013). "Determining the relative importance of soil sample locations to predict risk of child lead exposure." *Environ Int* **60**: 7-14.

¹⁵ Murray, K. S., D. T. Rogers, et al. (2004). "Heavy metals in an urban watershed in southeastern Michigan." *J Environ Qual* **33**(1): 163-172.

¹⁶ The value is from Table 5 in Murray, K. S., D. T. Rogers, et al. (2004). "Heavy metals in an urban watershed in southeastern Michigan." *J Environ Qual* **33**(1): 163-172.

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(geometric mean plus two standard deviations is approximately equivalent to the 97.5 percentile) may better account for potential building paint contributions to soil concentrations for urban residential soils than the geometric mean concentration of this dataset. The Flint park upper percentile (155 ppm) reported as two significant digits is equivalent to the Rouge River watershed residential soil lead geometric mean (160 ppm). The soil lead concentration of 160 ppm was selected for use in the calculation of the TSG Subcommittee's recommended health-based drinking water lead levels.

Maternal data

Maternal blood lead levels were changed to 0.8 µg/dL to match the NHANES (2011-2012) geometric mean lead level for women¹⁷.

Blood level of concern (cutoff) for risk estimation

A cutoff value of 5 micrograms per deciliter (µg/dL) was selected as that is the current Centers for Disease Control and Prevention blood reference level to identify children with blood lead levels that require follow-up actions. It is based on the blood lead level for the 97.5th percentile for the U.S. population of children, ages one to five¹⁸.

Outputs of the modeling runs and recommendation of drinking water lead levels for use during the evaluation of Flint school and daycare drinking water samples

The soil lead level of 160 ppm was selected as being the best surrogate for soil lead levels in the city of Flint. In the event that site-specific soil data is collected, the drinking water lead levels may need to be reevaluated. The entire set of modeling runs and figures can be found in Attachment 1.

The recommended drinking water lead levels resulted in a 5% risk or lower that a child had a blood lead level above 5 µg/dL. The 5% is an EPA health protection goal for young children exposed to lead at residential properties².

Evaluating school and daycare drinking water samples together

The recommended lead screening level for use while evaluating both school and daycare drinking water samples is 2 µg/L (ppb). This lead level in drinking water samples results in no more than a 5% risk that children age 7 or younger would have blood lead levels above 5 µg/dL.

Age range	Blood lead geometric mean (in micrograms per deciliter [µg/dL])	Risk that a child could have a blood lead level above 5 µg/dL
0-1 year olds	2.308	5.004%
0-7 year olds	2.056	2.934%

Assumptions integral to the use of the health-based school and daycare drinking water lead level

¹⁷ The Fourth National Report on Human Exposure to Environmental Chemicals, dated February 2015, can be found at http://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Feb2015.pdf.

¹⁸ The blood reference level and additional information can be found at http://www.cdc.gov/ncet/lead/ACCLPP/blood_lead_levels.htm.

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This calculation includes two assumptions. One is that people have lead levels in home drinking water of no more than 1 µg/L (ppb) or are using filters to reduce lead levels to 1 µg/L (ppb) or below. The second is that children do not live in homes with highly elevated levels of lead in home dust or soil. The modeled lead dust levels do not account for lead coming from pre-1978 paint. Eighty-two percent of city of Flint houses were built before 1970¹⁹. Soil highly impacted with lead paint may have lead levels higher than the 160 ppm used in this calculation. If children are not drinking filtered water at home, are ingesting lead paint chips, or have elevated levels of lead in home dust or soil, a lead level lower than the one recommended above may need to be selected for the evaluation of school and daycare drinking water samples.

Evaluating school and daycare drinking water samples separately

The recommended lead screening level for use while evaluating daycare drinking water samples is 2 µg/L (ppb). This lead level in drinking water samples results in no more than a 5% risk that children age 1 or younger would have blood lead levels above 5 µg/dL.

Age range	Blood lead geometric mean (in micrograms per deciliter [µg/dL])	Risk that a child could have a blood lead level above 5 µg/dL
0-1 year olds	2.308	5.004%
0-7 year olds	2.056	2.934%

Assumptions integral to the use of the health-based daycare drinking water lead level

This calculation includes two assumptions. One is that people have lead levels in home drinking water of no more than 1 µg/L (ppb) or are using filters to reduce lead levels to 1 µg/L (ppb) or below. The second is that children do not live in homes with highly elevated levels of lead in home dust or soil. The modeled lead dust levels do not account for lead coming from pre-1978 paint. Eighty-two percent of city of Flint houses were built before 1970²⁰. Soil highly impacted with lead paint may have lead levels higher than the 160 ppm used in this calculation. If children are not drinking filtered water at home, are ingesting lead paint chips, or have elevated levels of lead in home dust or soil, a lead level lower than the one recommended above may need to be selected for the evaluation of school and daycare drinking water samples.

The recommended lead screening level for use while evaluating K-12 school drinking water samples is 11 µg/L (ppb). This lead level in drinking water samples results in no more than a 5% risk that children age 7 or younger would have blood lead levels above 5 µg/dL. However, when evaluating a population of children age 1 or younger, their risk of having a blood lead level above 5µg/dL was 8.335%. The 11 µg/L (ppb) screening level is not adequately protective for children under the age of 1.

Age range	Blood lead geometric mean (in micrograms per deciliter [µg/dL])	Risk that a child could have a blood lead level above 5 µg/dL
0-1 year olds	2.61	8.335%

¹⁹ As determined by the U.S. Census and can be found at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_1YR_S1101&prodType=table.

²⁰ As determined by the U.S. Census and can be found at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_1YR_S1101&prodType=table.

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0-7 year olds	2.299	4.917%
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Assumptions integral to the use of the health-based school drinking water lead level

This calculation includes two assumptions. One is that people have lead levels in home drinking water of no more than 1 µg/L (ppb) or are using filters to reduce lead levels to 1 µg/L (ppb) or below. The second is that children do not live in homes with highly elevated levels of lead in home dust or soil. The modeled lead dust levels do not account for lead coming from pre-1978 paint. Eighty-two percent of city of Flint houses were built before 1970²¹. Soil highly impacted with lead paint may have lead levels higher than the 160 ppm used in this calculation. If children are not drinking filtered water at home, are ingesting lead paint chips, or have elevated levels of lead in home dust or soil, a lead level lower than the one recommended above may need to be selected for the evaluation of school and daycare drinking water samples.

²¹ As documented by the U.S. Census and can be found at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_1YR_S1101&prodType=table.

		0-1 year olds		0-7 year olds	
Soil lead levels (ppm)	Fountain water (ppb)	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL
47.6	0	1.184	0.109	0.92	0.016
155.3	0	2.198	4.014	1.958	2.302
160	0	2.24	4.381	2.002	2.573
400	0	4.268	36.82	4.135	34.306
2000	0	13.431	98.224	14.549	98.847
47.6	1	1.22	0.135	0.949	0.02
155.3	1	2.232	4.306	1.985	2.468
160	1	2.274	4.687	2.029	2.75
400	1	4.298	37.376	4.16	34.772
2000	1	13.447	98.235	14.564	98.954
47.6	2	1.257	0.165	0.977	0.026
155.3	2	2.266	4.609	2.012	2.64
160	2	2.308	5.004	2.056	2.934
400	2	4.327	37.929	4.184	35.236
2000	2	13.464	98.247	14.579	98.86
47.6	3	1.293	0.201	1.006	0.032
155.3	3	2.3	4.923	2.039	2.82
160	3	2.342	5.332	2.083	3.126
400	3	4.357	38.48	4.209	35.699
2000	3	13.48	98.258	14.595	98.867
47.6	4	1.33	0.241	1.034	0.04
155.3	4	2.334	5.248	2.067	3.007
160	4	2.376	5.671	2.11	3.324
400	4	4.386	39.029	4.233	36.161
2000	4	13.496	98.269	14.61	98.874
47.6	5	1.366	0.288	1.063	0.049
155.3	5	2.368	5.585	2.094	3.201
160	5	2.41	6.02	2.138	3.53
400	5	4.416	39.575	4.258	36.622
2000	5	13.513	98.28	14.625	98.88
47.6	6	1.402	0.341	1.091	0.06
155.3	6	2.401	5.932	2.121	3.402
160	6	2.443	6.381	2.165	3.743
400	6	4.445	40.118	4.282	37.082
2000	6	13.529	98.29	14.641	98.887
47.6	7	1.438	0.401	1.12	0.073
155.3	7	2.435	6.289	2.148	3.611
160	7	2.477	6.752	2.192	3.964
400	7	4.474	40.659	4.307	37.54
2000	7	13.545	98.301	14.656	98.893
47.6	8	1.474	0.468	1.148	0.087
155.3	8	2.468	6.658	2.175	3.827
160	8	2.51	7.133	2.219	4.191
400	8	4.504	41.196	4.331	37.997

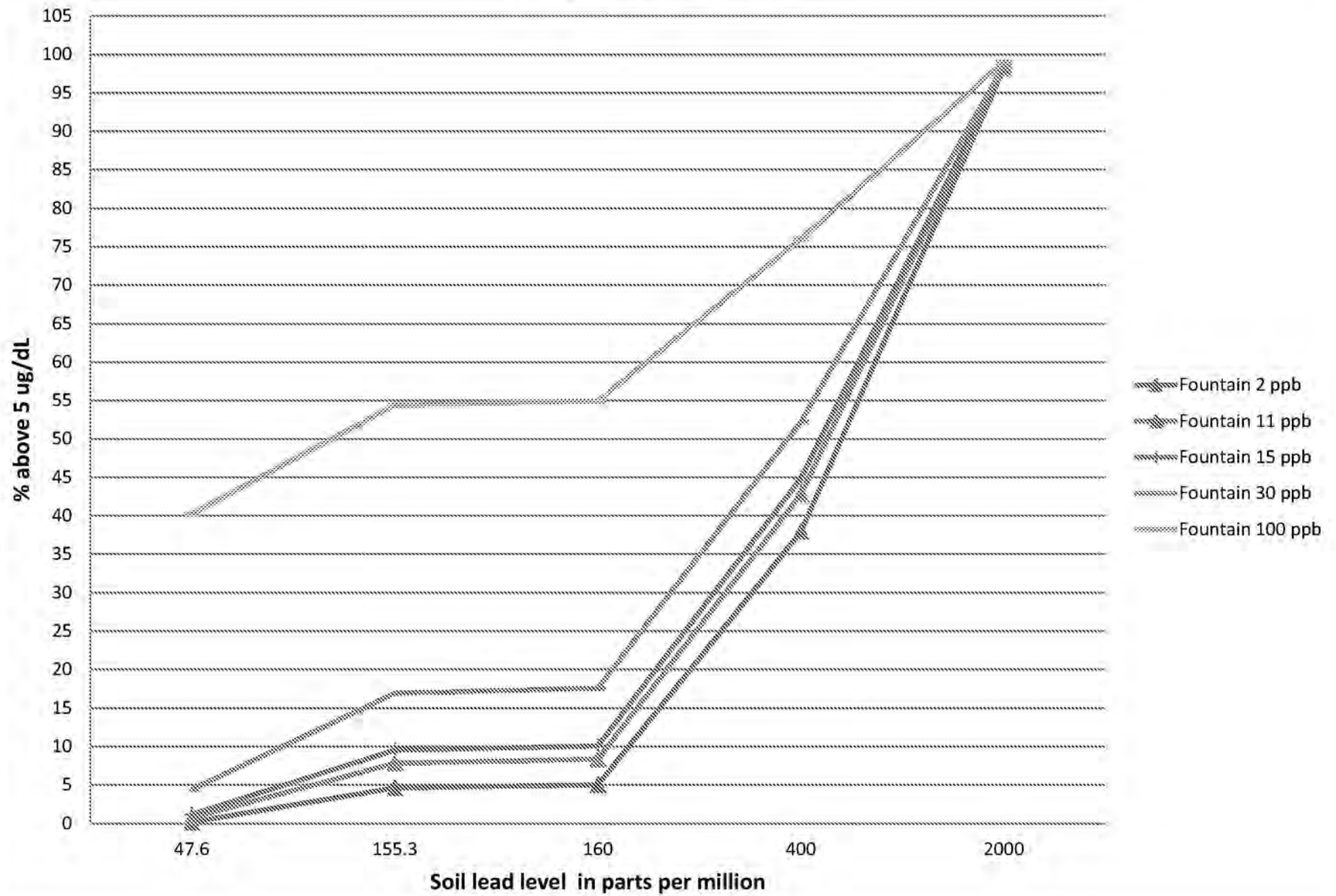
		0-1 year olds		0-7 year olds	
Soil lead levels (ppm)	Fountain water (ppb)	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL
2000	8	13.561	98.312	14.671	98.9
47.6	9	1.51	0.542	1.176	0.104
155.3	9	2.502	7.036	2.202	4.05
160	9	2.544	7.524	2.245	4.426
400	9	4.533	41.731	4.355	38.453
2000	9	13.577	98.323	14.686	98.906
47.6	10	1.546	0.625	1.205	0.123
155.3	10	2.535	7.425	2.229	4.28
160	10	2.577	7.925	2.272	4.668
400	10	4.562	42.263	4.38	38.907
2000	10	13.594	98.333	14.702	98.912
47.6	11	1.581	0.715	1.233	0.145
155.3	11	2.569	7.823	2.256	4.518
160	11	2.61	8.335	2.299	4.917
400	11	4.591	42.792	4.404	39.359
2000	11	13.61	98.344	14.717	98.919
47.6	12	1.617	0.815	1.261	0.169
155.3	12	2.602	8.231	2.283	4.762
160	12	2.643	8.755	2.326	5.174
400	12	4.62	43.317	4.428	39.81
2000	12	13.626	98.354	14.732	98.925
47.6	13	1.652	0.924	1.289	0.197
155.3	13	2.635	8.648	2.309	5.014
160	13	2.677	9.183	2.353	5.437
400	13	4.649	43.84	4.453	40.259
2000	13	13.642	98.364	14.747	98.931
47.6	14	1.688	1.043	1.317	0.227
155.3	14	2.668	9.075	2.336	5.273
160	14	2.71	9.621	2.38	5.707
400	14	4.677	44.359	4.477	40.707
2000	14	13.658	98.374	14.763	98.937
47.6	15	1.723	1.171	1.346	0.261
155.3	15	2.701	9.51	2.363	5.539
160	15	2.743	10.067	2.406	5.984
400	15	4.706	44.875	4.501	41.153
2000	15	13.674	98.385	14.778	98.944
47.6	30	2.243	4.406	1.762	1.325
155.3	30	3.188	16.918	2.76	10.313
160	30	3.228	17.593	2.803	10.908
400	30	5.131	52.202	4.861	47.608
2000	30	13.914	98.528	15.005	99.031
47.6	100	4.451	40.23	3.603	24.294
155.3	100	5.267	54.406	4.521	41.511
160	100	5.302	54.957	4.56	42.227

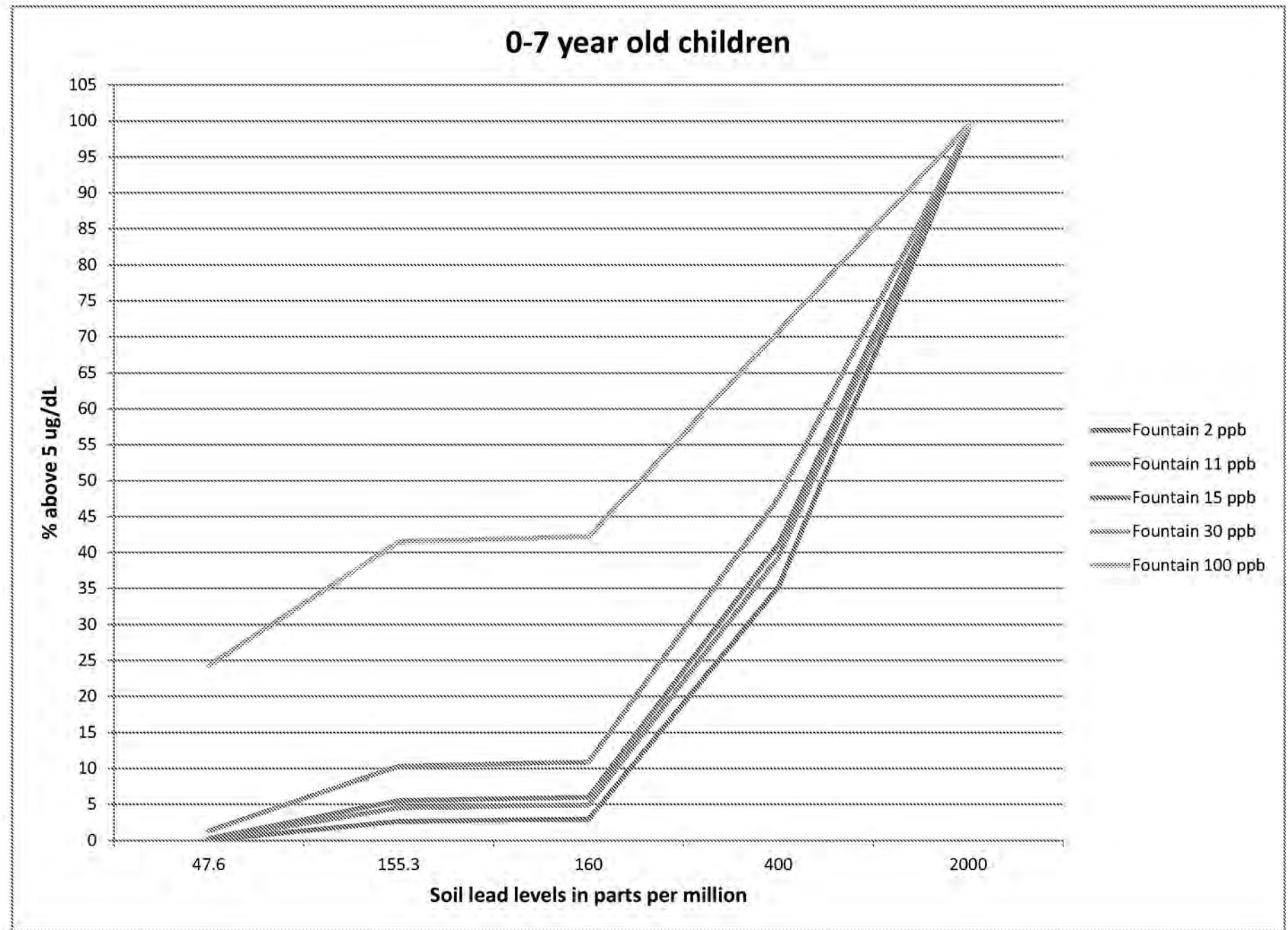
		0-1 year olds		0-7 year olds	
Soil lead levels (ppm)	Fountain water (ppb)	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL
400	100	6.967	75.99	6.463	70.746
2000	100	14.992	99.026	16.034	99.342

Soil lead levels (ppm)	Fountain water (ppb)	0-1 year olds		0-7 year olds	
		Geometric mean Blood lead level (ug/dL)	%>5 ug/dL	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL
47.6	0	1.184	0.109	0.92	0.016
47.6	1	1.22	0.135	0.949	0.02
47.6	2	1.257	0.165	0.977	0.026
47.6	3	1.293	0.201	1.006	0.032
47.6	4	1.33	0.241	1.034	0.04
47.6	5	1.366	0.288	1.063	0.049
47.6	6	1.402	0.341	1.091	0.06
47.6	7	1.438	0.401	1.12	0.073
47.6	8	1.474	0.468	1.148	0.087
47.6	9	1.51	0.542	1.176	0.104
47.6	10	1.546	0.625	1.205	0.123
47.6	11	1.581	0.715	1.233	0.145
47.6	12	1.617	0.815	1.261	0.169
47.6	13	1.652	0.924	1.289	0.197
47.6	14	1.688	1.043	1.317	0.227
47.6	15	1.723	1.171	1.346	0.261
47.6	30	2.243	4.406	1.762	1.325
47.6	100	4.451	40.23	3.603	24.294
155.3	0	2.198	4.014	1.958	2.302
155.3	1	2.232	4.306	1.985	2.468
155.3	2	2.266	4.609	2.012	2.64
155.3	3	2.3	4.923	2.039	2.82
155.3	4	2.334	5.248	2.067	3.007
155.3	5	2.368	5.585	2.094	3.201
155.3	6	2.401	5.932	2.121	3.402
155.3	7	2.435	6.289	2.148	3.611
155.3	8	2.468	6.658	2.175	3.827
155.3	9	2.502	7.036	2.202	4.05
155.3	10	2.535	7.425	2.229	4.28
155.3	11	2.569	7.823	2.256	4.518
155.3	12	2.602	8.231	2.283	4.762
155.3	13	2.635	8.648	2.309	5.014
155.3	14	2.668	9.075	2.336	5.273
155.3	15	2.701	9.51	2.363	5.539
155.3	30	3.188	16.918	2.76	10.313
155.3	100	5.267	54.406	4.521	41.511
160	0	2.24	4.381	2.002	2.573
160	1	2.274	4.687	2.029	2.75
160	2	2.308	5.004	2.056	2.934
160	3	2.342	5.332	2.083	3.126
160	4	2.376	5.671	2.11	3.324
160	5	2.41	6.02	2.138	3.53
160	6	2.443	6.381	2.165	3.743
160	7	2.477	6.752	2.192	3.964
160	8	2.51	7.133	2.219	4.191
160	9	2.544	7.524	2.245	4.426
160	10	2.577	7.925	2.272	4.668
160	11	2.61	8.335	2.299	4.917
160	12	2.643	8.755	2.326	5.174
160	13	2.677	9.183	2.353	5.437
160	14	2.71	9.621	2.38	5.707
160	15	2.743	10.067	2.406	5.984
160	30	3.228	17.593	2.803	10.908
160	100	5.302	54.957	4.56	42.227

Soil lead levels (ppm)	Fountain water (ppb)	0-1 year olds		0-7 year olds	
		Geometric mean Blood lead level (ug/dL)	%>5 ug/dL	Geometric mean Blood lead level (ug/dL)	%>5 ug/dL
400	0	4.268	36.82	4.135	34.306
400	1	4.298	37.376	4.16	34.772
400	2	4.327	37.929	4.184	35.236
400	3	4.357	38.48	4.209	35.699
400	4	4.386	39.029	4.233	36.161
400	5	4.416	39.575	4.258	36.622
400	6	4.445	40.118	4.282	37.082
400	7	4.474	40.659	4.307	37.54
400	8	4.504	41.196	4.331	37.997
400	9	4.533	41.731	4.355	38.453
400	10	4.562	42.263	4.38	38.907
400	11	4.591	42.792	4.404	39.359
400	12	4.62	43.317	4.428	39.81
400	13	4.649	43.84	4.453	40.259
400	14	4.677	44.359	4.477	40.707
400	15	4.706	44.875	4.501	41.153
400	30	5.131	52.202	4.861	47.608
400	100	6.967	75.99	6.463	70.746
2000	0	13.431	98.224	14.549	98.847
2000	1	13.447	98.235	14.564	98.954
2000	2	13.464	98.247	14.579	98.86
2000	3	13.48	98.258	14.595	98.867
2000	4	13.496	98.269	14.61	98.874
2000	5	13.513	98.28	14.625	98.88
2000	6	13.529	98.29	14.641	98.887
2000	7	13.545	98.301	14.656	98.893
2000	8	13.561	98.312	14.671	98.9
2000	9	13.577	98.323	14.686	98.906
2000	10	13.594	98.333	14.702	98.912
2000	11	13.61	98.344	14.717	98.919
2000	12	13.626	98.354	14.732	98.925
2000	13	13.642	98.364	14.747	98.931
2000	14	13.658	98.374	14.763	98.937
2000	15	13.674	98.385	14.778	98.944
2000	30	13.914	98.528	15.005	99.031
2000	100	14.992	99.026	16.034	99.342

0-1 year old children





From: Sygo, Jim (DEQ)
Sent: Monday, October 19, 2015 12:26 PM
To: McDonald, Paul (DEQ)
Cc: Premoe, Tara (DEQ); Shaler, Karen (DEQ)
Subject: RE: Flint wire transfer
Attachments: Fwd: Final Executed Flint Water Service Contract

The water service was started on Friday and attached is the executed contract.

Paul will communicate directly with the Accounting Service Center when he gets the information from Flint. He is handling remotely.

From: McDonald, Paul (DEQ)
Sent: Monday, October 19, 2015 10:10 AM
To: Sygo, Jim (DEQ)
Subject: Flint wire transfer

Jim,

As a reminder, we must comply with the boilerplate language prior to payment that requires "a legally executable agreement... and a successful reconnection has occurred." If you could forward any information you have on either of those items so that I can retain for our audit records, I would appreciate it.

Here is the information that I need **by 1:00 p.m.** from Flint in order to process the payment today:

1. Name of Bank-
2. Receiving Bank Routing Number-
3. Account Number-
4. Account Name-
5. Contact-
6. Amount-

Here is the paragraph you request, please feel free to edit at will:

To provide audit support for the outgoing payment to the City of Flint, the DEQ requires a complete electronic copy of the monthly invoice/statement it receives from the Detroit Water and Sewage Department (DWSD) or its successor. That invoice/statement must be verified by a City of Flint employee confirming the quantity of water used (against the cities own metering devices), rate being applied with regards to the agreed upon contract with DWSD and total amount of invoice/statement. Any challenges to the invoice received from the DWSD, either by a City of Flint or DEQ employee, shall be the responsibility of the City of Flint.

Please let me know if you need anything else. I'll be monitoring my e-mail and can be reached on my work cell (517) 242-9340 or personal cell after hours (517) 719-1138.

Paul

From: achubb@cityofflint.com
Sent: Saturday, October 17, 2015 8:39 AM
To: Sygo, Jim (DEQ)
Subject: Fwd: Final Executed Flint Water Service Contract
Attachments: Flint Water Contract FINAL EXECUTED 101615.pdf; ATT00001.htm

Jim, please see attached.

Anthony Chubb
 Interim Director of Human Resources and Labor Relations
 Deputy City Attorney
 City of Flint

Sent from my iPhone

Begin forwarded message:

From: Laurie Koester <koester@dwsd.org>
Date: October 16, 2015 at 4:02:47 PM EDT
To: Anthony Chubb <achubb@cityofflint.com>
Cc: Sue McCormick <mccormick@dwsd.org>, wolfson <wolfson@dwsd.org>, Cheryl Porter <cporter@dwsd.org>, Jim Fausone <jfausone@fb-firm.com>, Terry Daniel <tdaniel@dwsd.org>, Grant Gartrell <gartrell@dwsd.org>, Biren Saparia <saparia@dwsd.org>, Mathew Kannanthanam <mgeorge@dwsd.org>, Nicolette Bateson <bateson@dwsd.org>, Jonathan Wheatley <wheatley@dwsd.org>, bfoster <bfoster@fostergrouplic.com>, Gregory Eno <eno@dwsd.org>, smegen <smegen@dwsd.org>, Laurie Koester <koester@dwsd.org>
Subject: Final Executed Flint Water Service Contract

Anthony,

Attached for your records please find a fully executed water contract between the City of Detroit and the City of Flint. Please congratulate your team for the hard work and coordination in getting this accomplished so quickly.

Sincerely,

Laurie A. Koester
 Associate General Counsel
 Detroit Water and Sewerage Department
 735 Randolph, Room 701
 Detroit, Michigan 48226
 Office: (313) 964-9620
 Cell: (313) 999-3177

WATER SERVICE CONTRACT

BETWEEN

CITY OF DETROIT

AND

CITY OF FLINT

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**WATER SERVICE CONTRACT
BETWEEN
CITY OF DETROIT
AND
CITY OF FLINT**

This Water Service Contract ("Contract") is made between the City of Detroit, a municipal corporation, by its Water and Sewerage Department and Board of Water Commissioners (the "Board"), and the City of Flint, a municipal corporation ("Customer"). The Board and Customer may be referred to individually as "Party" or collectively as the "Parties."

Whereas, the City of Detroit owns a public water supply system ("System") operated by the Board; and

Whereas, the Board supplies water service to numerous governmental entities in the Board's water service area; and

Whereas, Customer is experiencing a public health emergency and desires to obtain water service from the Board in order to abate this emergency; and

Whereas, the purpose of this Contract is to provide potable water to Customer on an emergency basis; and

Whereas, because Customer shall receive water through a Board-owned master meter that also meters water usage by the Genesee County Drain Commissioner ("GCDC"), Customer has entered into a metering agreement with GCDC whereby GCDC agrees to report to the Board the volume of water attributable to Customer; and

ACCORDINGLY, THE PARTIES AGREE AS FOLLOWS:

**Article 1.
Definitions**

1.01 The following words and expressions, or pronouns used in their stead, shall be construed as follows:

"Adjusted Prevailing Water Rate" shall have the meaning ascribed in Article 3 herein.

"Allocation Flow Rate" shall mean the value that is established as a result of a breach of Section 5.03 herein and which value shall replace the contractual Maximum Flow Rate in the rate calculation process in the event that Section 5.04(C) herein is applied by the Board.

"Annual Volume" shall mean the actual volume of water used by Customer for the period of July 1st to June 30th as measured on bills issued from August 1st through July 31st.

"Board" shall mean the City of Detroit Board of Water Commissioners.

"City" shall mean the City of Detroit, a municipal corporation, acting through its Board of Water Commissioners.

"Contract" shall mean each of the various provisions and parts of this document, including all attached Exhibits and any amendments thereto, as may be executed and approved by Customer's governing body and the Board of Water Commissioners.

"Contract Term" shall have the meaning ascribed in Article 2 herein.

"Customer" shall mean the Party that enters into a contract with the City of Detroit by way of this Contract, whether an authority, city, township, village or other municipal corporation recognized by the State of Michigan.

"Customer Maximum Day Demand" shall mean the Customer's recorded water usage on the DWSD Maximum Day. Customer Maximum Day Demand shall, in conjunction with Customer Peak Hour Demand, be a component of its Maximum Flow Rate.

"Customer Peak Hour Demand" shall mean the Customer's recorded water usage during the DWSD Peak Hour. Customer Peak Hour Demand, in conjunction with Customer Maximum Day Demand, shall be a component of its Maximum Flow Rate.

"DWSD" shall mean the City of Detroit Water and Sewerage Department.

"DWSD Maximum Day" shall mean the maximum reported water production day for the System during any twenty-four hour period as measured from 12:00 a.m. Eastern Standard Time in any given calendar year, as determined by DWSD in reviewing water production and storage reports.

"DWSD Peak Hour" shall mean the hour during the DWSD Maximum Day in which the most water is delivered to the System, measured from top-of-the-hour to top-of-the-hour (e.g. 7:00 a.m. to 8:00 a.m.), and as determined by DWSD in reviewing water production and pumping reports. In calculating the DWSD Peak Hour, the time period from 11:00 PM to 5:00 AM Eastern Standard Time (EST) shall not be considered provided, however, that if Customer has an approved Filling Schedule, the time period specified in the Filling Schedule shall supersede the time period of 11:00 PM to 5:00 AM EST.

"Early Termination Costs" shall have the meaning ascribed in Article 3 herein.

"Filling Schedule" shall have the meaning ascribed in Article 22 herein.

"Maximum Flow Rate" shall mean the aggregate amount of water usage that Customer commits not to exceed, as determined by the Customer Maximum Day Demand and the Customer Peak Hour Demand, collectively.

"Meter Facilities" shall mean a location in which a water meter is housed including, without limitation, meter pits and meter vaults.

"Minimum Annual Volume" shall mean fifty percent of Customer's Projected Annual Volume.

"Notices" shall mean all notices, consents, approvals, requests and other communications required to be given under the terms of this Contract.

"Pressure Problem" shall have the meaning ascribed in Article 5 herein.

"Pressure Range" shall have the meaning ascribed in Article 5 herein.

"Projected Annual Volume" shall mean the projected annual water sales to Customer as set forth in Exhibit B.

"Service Area" shall mean the mutually agreed upon area where Customer is permitted to distribute water received from the Board under the terms of this Contract which (a) may be entirely within the corporate limits of Customer or may exceed the corporate limits of Customer and (b) which may or may not include the entire geographical area within the Customer's corporate limits.

"System" shall mean the public water works system owned and operated by the City of Detroit, acting through its Board of Water Commissioners and its Water and Sewerage Department.

"Technical Advisory Committee" shall mean the committee consisting of representatives of the Detroit Water and Sewerage Department, wholesale water customers of the Detroit Water and Sewerage Department and their respective representatives, and shall include its successor or replacement if altered or discontinued. The Technical Advisory Committee or its successor shall remain in existence for a minimum term of January 1, 2008 until December 31, 2038 unless the committee determines otherwise.

"Water Distribution Points" shall have the meaning ascribed in Article 4 herein.

Article 2. Contract Term

- 2.01 Term. The Board shall sell and supply water to Customer from the System in accordance with the terms of this Contract for a period of nine months from the effective date of this Contract (the "Contract Term"), subject to Article 3 herein. The effective date of this Contract shall be the date that this Contract is approved by the Customer's governing body or the Board whichever is later.
- 2.02 Extension of Term. Should the concern for public health continue beyond the initial Contract Term and a reasonable alternative to the temporary service provided by the Board does not readily exist, the Contract Term may be extended for any mutually agreeable period through a letter which sets forth the emergent circumstances signed by the Parties.
- 2.03 Reserved.

Article 3. Early Termination Costs

- 3.01 Early Termination Costs. In addition to any other remedies provided for by law or by the terms of this Contract, Customer shall be liable to the Board for the payment of any costs incurred by the Board related to providing water to Customer in the event Customer terminates this Contract before the conclusion of a Contract Term ("Early Termination Costs"), unless Customer terminates this Contract for cause in accordance with Article 10; provided, however, that payment of such Early Termination Costs by Customer shall not entitle Customer to receive water service from the Board.
- 3.02 Calculation of Costs. Payment of Early Termination Costs will be calculated by applying the Adjusted Prevailing Water Rate to the Minimum Annual Volume requirements for the remainder of the Contract Term. The Adjusted Prevailing Water Rate shall be the rate charged by the Board to Customer as of Customer's effective termination date, adjusted annually to reflect projected inflationary increases utilizing a locally based wholesale price index. The Parties may agree upon another standardized price index. The Board may seek a recommendation from the Technical Advisory Committee on the amount of the Early Termination Costs.
- 3.03 Specifically Constructed Facilities. If the Board has constructed facilities specifically for the benefit of Customer, additional costs may be included in the calculation of the Early Termination Costs, provided that any such facilities shall be identified in a written agreement between the Board and Customer at or near the time of construction.
- 3.04 Formation of Water Authority. Customer may join with another authority, city, township, village or other municipal corporation recognized by the State of Michigan to form a water authority for the sole purpose of collectively contracting for water service from the Board. The exercise of this right shall not be construed as an early termination of this Contract and this Contract shall be voided upon the approval of a new water service contract by Customer's governing body and the Board.
- 3.05 Customer Annexation or Consolidation. In the event the territory of Customer is annexed or consolidated with another Michigan municipal corporation and if said municipal corporation is a current customer of the Board, then such an annexation or consolidation shall not be construed as an early termination of this Contract and this Contract shall be voided upon the approval of a new or amended water service contract with the annexing or consolidating municipal corporation.

Article 4. Service Area

- 4.01 Delivery Location. Water shall be delivered by the Board to Customer at the location(s) identified in Exhibit A (collectively, the "Water Distribution Points"), and at other locations as may be mutually agreed upon in writing by the Board and Customer. The Board shall not require Customer to pay any fee to reconnect to the System. The Customer shall bear any and all actual costs, including without limitation capital and labor costs, associated with any work required to reconnect Customer to the System.

- 4.02 Limit of Responsibility. The Board shall have no responsibility for distributing, operating, repairing, replacing and maintaining any portions of the Customer's water supply system downstream of the Water Distribution Points shown in Exhibit A, provided, however, that this Section 4.02 does not prevent the application of the provisions of Section 11.02 herein.
- 4.03 Board Responsibility. The Board owns and is responsible for operating and maintaining all parts of its System upstream from Customer's Water Distribution Points. Should the Board fail to maintain its Meter Facilities and/or any Board owned and maintained equipment within the Meter Facilities, Customer shall provide written notice to the Board which describes the objectionable condition of the Meter Facility and/or the equipment within, and its intent to take reasonable steps to maintain the condition and charge the reasonable cost of doing so to the Board. Upon receipt of the notice and subject to Section 11.01, the Board shall have thirty calendar days to repair the condition specified in the notice, unless a force majeure event prevents the repair within the thirty-day period. If the Board has not repaired the condition at the conclusion of the thirty-day period and has not provided a written explanation to Customer explaining the reason for the delay (e.g. necessary parts are on order or occurrence of a force majeure event specified in Section 11.01), then Customer may take reasonable steps to maintain the specified condition and charge the reasonable cost of doing so to the Board.
- 4.04 Extension of Service Area. Customer's distribution of water supplied by the Board shall be limited to the Service Area stated in Exhibit A. The Parties agree that situations may arise in which Customer desires to extend its Service Area, either temporarily or permanently, beyond its corporate limits. Should such a situation arise, Customer shall provide written notice to the Board explaining the nature, duration and extent of the requested Service Area extension. The Board shall have the option, which it may exercise at any time, of requiring a written amendment to this Contract to accommodate the change in Service Area. Should the Board determine that an immediate amendment is required, the Parties shall, within thirty calendar days of Customer's request, meet to negotiate mutually agreeable terms for the extension of the Service Area. The Board shall not unreasonably deny a request to extend the Service Area.
- 4.05 Change or Addition of Water Distribution Points. Water Distribution Points may be added or changed only by the express written agreement of the Board and Customer and shall be embodied in a written amendment to this Contract.
- 4.06 Sole Supplier. Except as provided in Article 17 herein, the Board shall be the sole supplier of public potable water to Customer's Service Area.

Article 5.

Pressure; Maximum Flow Rate; Minimum Annual Volume

- 5.01 Pressure Range. The Board shall use its best efforts to deliver water at the Water Distribution Points at a pressure range ("Pressure Range") adequate to meet the reasonable requirements of Customer. For purposes of evaluating this effort, water pressure shall be determined by reviewing the average hourly pressure measured from top-of-the-hour to top-of-the-hour (e.g. 7:00 a.m. to 8:00 a.m.). The Pressure Range to be provided by the Board to Customer's Water Distribution Points is specified in Exhibit B. The location at

which the water pressure will be measured shall be specified in Exhibit A and identified as point "P". A Pressure Range will not be established for water meters that are not located on a DWSD transmission main, or which are located on a DWSD transmission main and are downstream of and subject to the flow demands of a water meter for another Board customer.

5.02 Remedy for Non-Compliance with Pressure Range. If the water pressure at Customer's Water Distribution Points is above or below the Pressure Range, at Customer's request the Parties shall meet within thirty calendar days to discuss the reasons for the non-compliance and, if agreed necessary, develop and implement a mutually agreeable written corrective action plan within sixty calendar days of the meeting, or as otherwise agreed. The corrective action plan shall include a timetable for resolution of the non-compliance issue(s).

- A. If it is determined that another customer's exceedance of the rates of flow established by that customer's Maximum Flow Rate caused or contributed to the Board's inability to meet its Pressure Range agreement with Customer, then the corrective action plan shall provide for the resolution of the issue.
- B. If Customer is exceeding the rates of flow established by its Maximum Flow Rate on a day other than the DWSD Maximum Day at the time Customer experiences a variation from the Pressure Range, then the Board shall be relieved from its obligation to provide water to Customer within the Pressure Range for that period of time during which Customer is exceeding the rates of flow established by its Maximum Flow Rate.

5.03 Maximum Flow Rate. Customer's Maximum Flow Rate is specified in Exhibit B. Customer shall not exceed the Maximum Flow Rate specified in Exhibit B, as measured in million gallons on the DWSD Maximum Day and during the DWSD Peak Hour.

- A. The Board shall notify all customers in writing on or before October 1 of each calendar year if Customer or any other wholesale customer is alleged to have exceeded its Maximum Flow Rate in a given calendar year. The notice shall state the day and/or hour that Customer or any other wholesale water customer is alleged to have exceeded its Maximum Flow Rate.
- B. If Customer is alleged to be in breach of its obligations under this Section 5.03, the Board and Customer shall endeavor to meet before November 1 of the current calendar year, or as soon as practicable, for the purposes of validating the breach, reviewing and analyzing the causes, and to negotiate a possible remedy pursuant to Sections 5.04 and 5.05 herein.
- C. The Technical Advisory Committee's Analytical Work Group, or its successor shall review any alleged breach of this Section 5.03.
 - i. The Analytical Work Group shall meet once, at a minimum, on or before November 1 of each calendar year to review the alleged breaches, if any,

and may thereafter schedule subsequent meetings as necessary to conclude its review.

- ii. The Board will seek a recommendation from the Analytical Work Group on (1) an Allocation Flow Rate, if any, and/or (2) concurrence with the remedy tentatively negotiated between Customer and the Board, if any. Customer and the Board shall have the right to present any information related to the alleged breach a Party deems necessary to the deliberations.
- iii. Any recommendation submitted by the Analytical Work Group shall be received by the Board on or before December 1 of each calendar year.

5.04 Remedy for Non-Compliance with Maximum Flow Rate. The Board has no obligation to supply to Customer more than the Maximum Flow Rate. If Customer exceeds its Maximum Flow Rate on the DWSD Maximum Day or during the DWSD Peak Hour, the Board and Customer may, as needed, take one or more of the following actions set forth in this Section 5.04. The applicability of any particular action shall be evaluated by the Board on a case-by-case basis.

- A. The Board may require that Customer take all reasonable steps to reduce its consumption to the Maximum Flow Rate. Such steps may include water conservation measures, outdoor water use restrictions, water loss studies and remediation, and an internal system operation evaluation.
- B. The Parties may meet to negotiate a new Maximum Flow Rate. If so negotiated, Customer shall pay the rate associated with the new Maximum Flow Rate in the subsequent rate year.
- C. For ratemaking and cost allocation purposes only, the Board may recalculate Customer's rate for the current and/or subsequent fiscal years utilizing a revised cost allocation formula as follows:
 - i. The Board shall, as set forth below, establish an Allocation Flow Rate to replace the contractual Maximum Flow Rate in the rate calculation process.
 - ii. The Allocation Flow Rate shall be applied from no earlier than the first exceedance date forward.
 - iii. The Allocation Flow Rate will be at least equal to the flow rate demonstrated by Customer on the DWSD Maximum Day, and may be higher than the actual flow rate demonstrated by Customer.
 - iv. Pursuant to Section 5.03(C), if the Board receives a recommendation on the Allocation Flow Rate to be applied from the Analytical Work Group and the recommendation is higher than twice the amount by which the demonstrated flow rate exceeded the original Maximum Flow Rate, then the Board shall be limited to establishing an Allocation Flow Rate that is at least equal to the flow rate demonstrated by Customer on the DWSD Maximum

Day and no higher than the recommendation provided by the Analytical Work Group.

- v. If no recommendation on the Allocation Flow Rate to be applied is received by the Board, or if the Board receives a recommendation and the recommendation is less than twice the amount by which the demonstrated flow rate exceeded the original Maximum Flow Rate, then the Board shall be limited to establishing an Allocation Flow Rate that is at least equal to the flow rate demonstrated by Customer on the DWSD Maximum Day and no higher than twice the amount by which the demonstrated flow rate exceeded the original Maximum Flow Rate.
- vi. The Allocation Flow Rate will continue to be applied to each subsequent year's rate calculation process until the Maximum Flow Rate is renegotiated.
- vii. If a rate has been approved for the subsequent fiscal year (July 1st to June 30th) but the rate has not yet been applied, the Board may modify Customer's rate for that subsequent fiscal year to account for an exceedance of its Maximum Flow Rate.
- viii. If the Board has built capital facilities based upon Customer's negotiated Maximum Flow Rate and Customer consistently exceeds its Maximum Flow Rate, then the Board may re-calculate the amount of Customer's percentage of the capital cost of such facilities

5.05 Procedure for Non-Compliance with Maximum Flow Rate. In addition to the remedies specified in Section 5.04, if Customer has failed in its obligations under Section 5.03, the Parties shall meet to discuss the reasons for the non-compliance and if agreed necessary, develop a mutually agreeable written corrective action plan by December 31 of the year in which the non-compliance occurred, or as otherwise agreed. Any corrective action plan required under this Section 5.05 shall include a timetable for resolution of the non-compliance issue(s).

- A. If the Parties determine that a corrective action plan is not required and an incident of non-compliance occurs in the subsequent calendar year, the Parties shall meet to develop a mutually agreeable written corrective action plan by December 31 of the year in which the non-compliance occurred, or as otherwise agreed.
- B. In the event the reason for Customer's non-compliance under Section 5.03 is due to a Customer water main break, fire or meter calibration performed by DWSD, these events will be taken into consideration in determining (1) whether a corrective action plan is warranted and (2) the extent to which, if any, the steps specified in Section 5.04 should apply.

5.06 Minimum Annual Volume. Customer shall purchase from the Board not less than the Minimum Annual Volume of water specified in Exhibit B. If Customer's Annual Volume is less than the Minimum Annual Volume, Customer shall pay to the Board an amount

computed by applying the current rate to the Minimum Annual Volume less any amounts already billed to the Customer by the Board.

5.07 Periodic Review. For Customer and System planning purposes and, with regard to the Minimum Annual Volume, enforcement of the provisions of Article 3, a Maximum Flow Rate, Pressure Range, Projected Annual Volume and Minimum Annual Volume shall be established by mutual agreement for the Contract Term. If the Contract Term exceeds two years, a contractually binding Maximum Flow Rate, Pressure Range, Projected Annual Volume and Minimum Annual Volume shall be established by mutual agreement for first two years of the Contract Term. If the Contract Term exceeds two years, not later than the second year of the Contract Term, the Board and Customer shall negotiate a contractually binding Maximum Flow Rate, Pressure Range, Projected Annual Volume and Minimum Annual Volume for the succeeding three years of the Contract Term. If the Contract Term exceeds five years, not later than the fifth year of the Contract Term, and every five years thereafter, the Board and Customer shall negotiate a contractually binding Maximum Flow Rate, Pressure Range, Projected Annual Volume and Minimum Annual Volume for the succeeding five years of the Contract Term. If the Parties do not negotiate new or revised Maximum Flow Rates, Pressure Ranges, Projected Annual Volumes and Minimum Annual Volumes according to the aforementioned schedule, then the figures established for planning purposes (as shown in italicized type in Exhibit B) shall become contractually binding for the then-current three or five year term.

5.08 Remedy for Excessive Rate(s) of Flow Causing Pressure Problem(s). Customer acknowledges that Customer's rates of flow may cause and/or contribute to the Board's inability to meet its Pressure Range agreements with Customer and/or the Board's other customers (hereinafter, "Pressure Problem"). The Board may review or monitor Customer's daily rates of flow if a Pressure Problem occurs and the Board's Pressure Range agreement with Customer and/or another customer of the Board is alleged to have been breached. The approximate rate of flow by individual meter location used to establish the Pressure Range and Maximum Flow Rate is specified in Exhibit B. If a Pressure Problem occurs, the Parties shall meet to discuss the reasons for the Pressure Problem and develop and implement a mutually agreeable written corrective action plan within sixty calendar days of the Pressure Problem, or as otherwise agreed. The corrective action plan may require one or both of the following steps:

- A. The Board may require that Customer take all reasonable steps to reduce its consumption to the rate of flow established by the Maximum Flow Rate. Such steps may include water conservation measures, outdoor water use restrictions, water loss studies and remediation, and an internal system operation evaluation. In addition, the Board may require that Customer adjust its rate of flow at individual meters, including the establishment of a not-to-exceed flow rate for individual meters.
- B. The Parties may meet to negotiate a new Maximum Flow Rate. If so negotiated, Customer shall pay the rate associated with the new Maximum Flow Rate in the subsequent rate year.

If the Parties determine that a corrective action plan is not required and a subsequent Pressure Problem occurs, the Parties shall meet to develop and implement a mutually agreeable written corrective action plan within sixty calendar days of the subsequent Pressure Problem, or as otherwise agreed. Any corrective action plan required under this Section 5.08 shall include a timetable for resolution of the Pressure Problem. In the event the reason for the Pressure Problem is due to a Customer water main break, fire or meter calibration performed by DWSD, these events will be taken into consideration in determining (1) whether a corrective action plan is warranted and (2) the extent to which, if any, the steps specified above in this Section 5.08 should apply.

- 5.09 Board Costs for Corrective Action Plan. If at any time the Board is required under the terms of this Article 5 to develop and implement a corrective action plan and the plan involves incurring capital costs, the Board will determine whether the costs will be charged as a System cost or whether the cost will be borne by a specific customer or customers. If the Board determines that all or part of the costs should be borne by a specific customer or customers, the Board will seek a recommendation from the Technical Advisory Committee on the assessment of the costs.
- 5.10 Customer Costs for Corrective Action Plan. If at any time Customer is required under the terms of this Article 5 to develop and implement a corrective action plan, Customer shall be so informed in writing and Customer will pay all costs related to the corrective action plan.

Article 6. Technical Advisory Committee

- 6.01 Establishment. The Technical Advisory Committee is formed to facilitate a cooperative working partnership between the Board and its wholesale water customers by facilitating the development of recommendations regarding System planning and supply to DWSD management and the Board. The Technical Advisory Committee shall maintain bylaws that govern the way it conducts its business. In the event of a conflict between the terms of the bylaws adopted by the Technical Advisory Committee and the terms of this Contract, the terms of this Contract shall control.
- 6.02 General Responsibilities. The Technical Advisory Committee shall periodically review and evaluate the rates, rate methodology, and performance of the System. The Technical Advisory Committee shall review and evaluate flow rates, pressures and Annual Volumes for the System at a minimum of every five years to assist the Board in its System planning effort. The Technical Advisory Committee shall have the opportunity each year to review the Capital Improvement Program as prepared by DWSD, prior to its adoption by the Board. The Technical Advisory Committee may consider Customer proposals for improving the operation of Customer's water system and/or the System. The Board will supply the Technical Advisory Committee with information the Board deems reasonably necessary to accomplish the general responsibilities defined in this Section 6.02.
- 6.03 Annual Report by Board. The Board will present an annual report to the Technical Advisory Committee which shall consist of (1) all instances of non-compliance with the Parties' obligations contained in Article 5 herein, including Customer and Board responses

thereto; (2) a general report on System operation and maintenance; and (3) a report that lists those contracts, if any, that have been entered into by the Board and another customer(s) where the terms of the contract(s) invoke the application of Article 14 herein.

- 6.04 Notification of Rates. The Board shall provide Customer and the Technical Advisory Committee with notice of the proposed rates for each fiscal year as early as possible before the implementation of the rates.
- 6.05 Disclosure of Rate Information by Board. Each year, the Board will disclose to Customer and the Technical Advisory Committee information related to wholesale rates.
- 6.06 Disclosure of Rate Information by Customer. Each year, Customer will disclose to its customers information related to its retail rates and other charges, and information regarding what portion of those costs is related to charges from DWSD and/or other major service providers.
- 6.07 Work Groups. The Technical Advisory Committee may create work groups to address specific issues facing the System. The work groups in existence as of January 1, 2008 are the Analytical Work Group, the Best Practices Work Group, the Contract Work Group, the Customer Service Work Group, the Emergency Preparedness Work Group, and the Rates Work Group. Any reference to a particular work group in this Contract shall include its successor or replacement if altered or discontinued.

Article 7. Rates

- 7.01 Rates. Customer agrees to pay for all water supplied by the Board at such rates as the Board may establish. Rates shall be reasonable in relation to the costs incurred by the Board for the supply of water and shall conform to Public Act 34 of 1917, Michigan Compiled Laws, Sec. 123.141, et seq., as amended. The Board shall give written notice of any changes in the rates. Notice shall be made in accordance with Section 5e of Public Act 279 of 1909, Michigan Compiled Laws, Sec. 117.5e, as amended, ("Act 279").
- 7.02 Notification of Rates. As soon as possible in the ratemaking process, the Board shall provide information on proposed rates and the draft data and information used in the calculation of proposed rates in a format that will enable Customer to assist in the ratemaking process. Not less than thirty calendar days prior to the hearing required by Act 279, the Board shall provide Customer with written notice of a proposed rate and the underlying data used to calculate the rate. The Board shall meet with Customer to review the rate and the data.
- 7.03 Estimate of Usage. In the event that the Board-owned master meter known as GN-01 fails to correctly measure the quantity of water supplied to Customer for any period of time, the Board shall provide a reasonable estimate of the quantity of water supplied to Customer for such period provided that there is a reasonable basis for the estimate. Customer and the Board shall, either through their respective technical representatives and/or the Technical Advisory Committee, seek agreement upon a method to estimate such quantities. In the event the Parties are unable to agree upon a method to estimate such quantities, the

Board's determination of a method shall be conclusive and the Customer agrees to accept the estimate established by the Board.

- 7.04 Rate Methodology. The Board agrees to provide to Customer a description of the current methodology for rate making in the form of the "Rates 101" document produced by the Technical Advisory Committee, as may be periodically updated. The "Rates 101" document, entitled *DWSD Rates: Understanding DWSD Wholesale Water Rates*, and any updates thereto shall be provided to Customer via posting on the DWSD website.

Article 8. Meters and Meter Facilities

- 8.01 Metering Requirement. All water furnished by the Board to Customer shall be measured by water meters installed in Meter Facilities at Customer's Water Distribution Points unless, in the Board's determination, it is not feasible to install water meters due to the configuration of Customer's water system. Customer's water usage shall be measured by the Board-owned master meter known as GN-01. Because GN-01 also measures the water usage of GCDC, Customer has a separate metering agreement with GCDC (attached as Exhibit C) whereby GCDC will report to Customer and the Board on a monthly basis the volume of water attributable to Customer through the GN-01 master meter. Customer shall ensure that GCDC provides the monthly meter information, specifying the unit of measurement used, on or before the 5th day of each calendar month. Customer shall ensure that the Board has the right at any time to audit the metering information provided by GCDC.
- 8.02 Existing Distribution Points. As of the effective date of this Contract, the Board shall own, operate and maintain all water meters and Meter Facilities for all existing Water Distribution Points, unless specifically indicated otherwise in Exhibit A.
- 8.03 Customer Maintenance Responsibilities. Customer shall be responsible for maintaining at its Water Distribution Points any and all appurtenances as may be designated as Customer's responsibility in Exhibit A. Should Customer fail to maintain the appurtenances shown in Exhibit A, the Board may take reasonable steps to maintain the appurtenances and charge the reasonable cost of doing so to Customer. Prior to the Board taking action to maintain the appurtenances, the Board shall give Customer thirty days written notice to complete the required maintenance. Notice to the Customer shall not be required if, in the Board's determination, there exists an emergency condition affecting the operation of the System or if the health, safety and welfare of the general public may be jeopardized.
- 8.04 New Distribution Points. For any new Water Distribution Points that may be constructed or installed after the effective date of this Contract, Customer shall furnish at Customer's expense, a water meter and Meter Facility that meets the Board's specifications. Thereafter, the Board shall furnish any replacement water meters for new Water Distribution Points and the expense shall be recovered through the Board's rates as a System cost. The Board shall own, operate and maintain all water meters and Meter Facilities after construction, installation or replacement, unless specifically indicated otherwise in Exhibit A.

- 8.05 Meter Repair and Replacement. If the Board initiates a meter repair or meter replacement, the cost shall be recovered through the Board's rates as a System cost. If Customer requests a meter replacement for reasons other than malfunction or disrepair, Customer shall pay the cost of the replacement.
- 8.06 Pressure Regulating Facilities. After the effective date of this Contract, all newly installed Customer-owned pressure regulating facilities shall be installed in a facility that is separate from the Board's Meter Facility.

**Article 9.
Reserved**

**Article 10.
Reserved**

**Article 11.
Force Majeure, Hold Harmless and Other Events**

- 11.01 Force Majeure. No failure or delay in performance of this Contract, by either Party, shall be deemed to be a breach thereof when such failure or delay is caused by a force majeure event including, but not limited to, any Act of God, strikes, lockouts, wars, acts of terrorism, riots, epidemics, explosions, sabotage, breakage or accident to machinery or lines of pipe, the binding order of any court or governmental authority, or any other cause, whether of the kind herein enumerated or otherwise, not within the control of a Party, except that no cause or contingency shall relieve Customer of its obligation to make payment for water delivered by the Board.
- 11.02 Board Held Harmless. Customer is experiencing a public health emergency which has resulted in the necessity of entering into this Contract. The Parties do not know the extent of the claims and/or damages which may result from the emergency, nor if the provision of water services by the Board will abate, improve or otherwise alleviate this emergency. As such, the Board shall not be held liable or accountable for any alleged water source or supply issues, or bursting, leakage, breakage, damage or accident of any kind that may occur to Customer's water works system, or any alleged damages of any kind or nature, including, but not limited to, injury to persons or damage to property, resulting from or alleged to result from such water source or supply issues, or bursting, leakage, breakage, damage or accident that may occur to water mains or pipes located downstream of the Water Distribution Points specified herein, or located within Customer's distribution system. Furthermore, to the extent permitted by law, Customer shall indemnify, defend and hold harmless the City of Detroit and the Great Lakes Water Authority from and against any and all alleged liabilities, obligations, damages, penalties, claims, costs, charges, losses and expenses (including, without limitation, fees and expenses for attorneys, expert witnesses and other consultants) that may be imposed upon, incurred by or asserted against the City of Detroit or the Great Lakes Water Authority and their respective departments, officers, employees or agents by reason of any of the following alleged to be attributable to the provision of water services under the terms of this Contract:

- A. Any and all alleged injury to persons or damage to property; and
 - B. Any alleged failure by Customer or its agents to perform its obligations, either express or implied, under this Contract; and
 - C. Any alleged act, error or omission of Customer or its agents with regard to (i) Customer's distribution of water supplied by the Board downstream of the Water Distribution Point, and (ii) any alteration by Customer or its agents to the water supplied by the Board downstream of the Water Distribution Point, including without limitation any chemical additions to the water as set forth in Section 17.05.
- 11.03 Discontinuance of Service. In the event the public health, safety and welfare requires the Board to discontinue temporarily all or part of the supply of water to Customer, no claims for damages of any kind or nature for such discontinuance shall be made by Customer against the Board. The Board will provide notice to Customer of any temporary discontinuance of the water supply.

Article 12. Timely Payment

- 12.01 Billing and Payment. Bills for water service shall be rendered to Customer on a monthly basis. Notwithstanding the provisions of this Article 12, all such bills shall be due and payable within forty-five calendar days from the date shown on the bill. Any portion of the charges that are not paid by the due date shall be subject to a finance charge at a rate of 1.5% per month for each month that they remain unpaid. Any portion of the total bill, plus any finance charges applied to the bill which are not paid by the next billing date, shall be shown on the next bill as arrears.
- 12.02 Dispute. The Board may disconnect water service in accordance with the terms of this Contract, including without limitation Sections 12.03 and 12.04. The Board shall not terminate water service if there is a good faith dispute concerning the accuracy of billings. If the accuracy of a bill is in dispute, Customer shall have ten (10) business days in which to provide written notice to the Board of its dispute with the bill and shall place the disputed amount in an escrow account pending resolution of the dispute. Accrued interest on the escrow account shall belong to the Party that prevails in the resolution of the dispute.
- 12.03 Estimated Prepayment for Services. Customer shall deposit with the Board as an estimated prepayment for services for the term of this Contract certain funds as follows: (a) on or before October 16, 2015, an amount equal to Two Million and 00/100 Dollars (\$2,000,000.00), and (b) on or before October 19, 2015, an amount equal to Eight Million and 00/100 Dollars (\$8,000,000.00). Collectively, the Ten Million and 00/100 Dollars (\$10,000,000.00) shall be referred to as the "Estimated Prepayment". The Estimated Prepayment will be credited to Customer's suburban billing account with the Board. Each month, the Board shall be entitled to draw down from the Estimated Prepayment a sum equal to the amount of the then-current billing. If at any time the Board determines in its sole and reasonable discretion that the remaining amount of the Estimated Prepayment will be insufficient to cover the next monthly billing and/or the remainder of the Contract Term,

Customer shall be required to replenish within thirty (30) days the estimated prepaid funds in the amount required by the Board provided, however, that the Parties shall endeavor to mutually agree upon the amount. Failure to so replenish the estimated prepaid funds shall permit the Board to terminate services to Customer. At the conclusion of the Contract Term, if Customer is in good standing with the Board and there are funds remaining from the Estimated Prepayment, Customer shall be entitled to the prompt return of all such funds. The Estimated Prepayment made by Customer shall not relieve Customer of its obligation to make payment in full for all water delivered by the Board to Customer.

- 12.04 Account Stated. Notwithstanding the provisions of this Article 12, if Customer fails to make timely payment on invoices due as set forth in this Contract, in addition to terminating services to Customer, the Board shall be entitled to have a judgment entered against Customer for the entire unpaid balance, together with late fees, finance charges, interest, and the costs and reasonable attorney fees required to obtain that judgment. The Board shall be entitled to file this Contract in a court of proper jurisdiction as evidence of Customer's agreement to the existence of the debt stated and Customer's agreement to its liability for that debt.

Article 13. Assignment

- 13.01 The Board shall be permitted to assign this Contract to any successor in interest without the prior consent of Customer. Thereafter, and as soon as practicable, the Board shall provide written notice to Customer of the assignment.

Article 14. Reserved

Article 15. Amendment

- 15.01 The Parties may periodically consider it in their best interests to change, modify or extend a term, condition or covenant of this Contract for reasons which may include, but are not limited to, the creation, expansion or closing of industry or other business. Any change, addition, deletion, extension or modification that is mutually agreed upon by the Board and Customer shall be incorporated in a written amendment to this Contract. Such amendments shall not invalidate this Contract nor relieve or release either Party of any of its respective obligations under this Contract unless so stated in the amendment.
- 15.02 No amendment to this Contract shall be effective and binding upon the Parties unless it expressly makes reference to this Contract, is in writing, is signed and acknowledged by duly authorized representatives of both Parties.

Article 16. Notices

- 16.01 Except as otherwise specified herein, all notices, consents, approvals, requests and other communications (collectively, "Notices") required or permitted under this Contract shall be given in writing and mailed by first class mail to the Parties and at the addresses identified in Exhibit B.
- 16.02 All Notices shall be deemed given on the day of post-marked mailing. Any Notice given by a Party hereunder must be signed by an authorized representative of such Party.
- 16.03 Notwithstanding the requirement above as to the use of first-class mail, change of address notices, termination notices, and other Notices of a legal nature, shall be sent by certified first-class mail, postage prepaid, return receipt requested.

Article 17. Water Quality

- 17.01 Contamination. For the protection of the health of all consumers supplied with water from the System, Customer agrees to guard carefully against all forms of contamination. Should contamination occur, the area or areas affected shall immediately be shut off and isolated, and shall remain so until such conditions shall have been abated, and the water declared safe and fit for human consumption by the properly constituted governmental health agencies having jurisdiction of the area affected. Customer shall immediately notify the Board, and the Board shall immediately notify Customer, of any emergency or condition that may affect the quality of water in either Party's system.
- 17.02 Co-mingling of Water Sources. Except in cases of emergency other than the specific public health emergency addressed by this Contract, Customer will not permit water from any other source of supply to be mixed or mingled with water from the System without prior written approval from the Board. In cases of emergency, only such water from sources other than the Board shall be used as shall meet the requirements of the Michigan Department of Environmental Quality, and then only in such quantities as shall be necessary to relieve the emergency.
- 17.03 Emergency Connections. During emergencies other than the specific public health emergency addressed by this Contract, Customer's water facilities may be used and connected, at the discretion of the Board, to water facilities serving other communities for flow in either direction to provide an adequate water supply from the System to Customer and to other areas and other units of government. Customer shall be permitted to immediately make an emergency connection when the connection point to be used has been previously approved for emergency use by the Board in writing, provided that Customer shall, after making the connection, promptly notify the Board of such event. When the emergency has been abated, the emergency connection must be severed as soon as practicable. The Board, or its designee, must approve, in writing, the continuation of any emergency connection that is required for longer than seven calendar days. If an approved emergency connection continues for more than seven calendar days, Customer must

provide the Board with weekly updates on the emergency and a schedule for abatement of the emergency that must be approved by the Board in writing.

- 17.04 Water Quality. The Board shall endeavor to remain in compliance with all applicable Michigan and Federal laws, rules and regulations regarding drinking water quality.
- 17.05 Chemical Additions, Public Relations. Customer has advised the Board that in order to more effectively address its public health emergency, it may inject additional chemical treatments into the water it receives from the Board. Customer shall prevent the backflow of any water containing additional chemical treatments by Customer from entering into the System and any other water systems utilizing water provided by the System. Customer acknowledges that such additional chemical treatments may result in chemical, biological and/or physical changes to the water provided by the Board. In order that the public be kept fully informed as to the explanation for any chemical, biological and/or physical changes and to ensure that the Board's long established and award winning brand is not diminished in any way, Customer agrees to coordinate with and seek the approval of the Board regarding its public relations communications on these issues.

Article 18. Rights-of-Way

- 18.01 Use of Rights-of-Way. The Customer shall assist the Board to obtain permission to use streets, highways, alleys, and/or easements in the local governmental units within the Customer's jurisdiction for the purpose of constructing, maintaining, and operating water facilities to adequately service the Customer's jurisdiction and other areas. This assistance shall include obtaining the consent of the local governmental units, as provided in Article 7, Section 29, Michigan Constitution of 1963. In the event of such construction, the Board shall request the Customer and local governmental units within the Customer's jurisdiction to execute such separate instruments granting rights-of-way in its streets, highways, and alleys as may be reasonably required by the Board. The Board shall give the Customer notice of any construction work in the Customer's jurisdiction. The Board shall comply with any of Customer's ordinances that apply to the construction. Customer shall inform the Board of the applicable ordinances. The Board and Customer shall meet to review the construction and its impact on their respective operations. The Board shall restore all existing structures and/or improvements laying in the right-of-way of construction to as good a condition as before the construction took place. Any such facilities constructed, maintained and operated under this section shall remain the property of the Board and shall not be operated or maintained by any entity other than the Board or its authorized representatives.
- 18.02 Relocation of Facilities. Should future construction by any city, township, village, or county require relocation of a water transmission main, Meter Facility or other Board facility, the cost incurred by the Board for such relocation, if not reimbursed by the entity requiring the relocation, will be charged in future rates as a common-to-all cost to all System users.
- 18.03 Easements. Subject to the provisions of Section 18.01 herein and to the extent that Customer has jurisdiction, the Board shall be granted temporary and permanent easements,

and shall be permitted to use the streets, alleys and highways within Customer's legal jurisdiction for the purpose of constructing, operating and maintaining the System, including the relocation of water transmission mains, Meter Facilities or other Board facilities. This consent by Customer is given in compliance with Article 7, Sec. 29 of the Michigan Constitution of 1963, provided that the Board shall provide Customer with a written explanation of the type of easement required and the duration thereof.

Article 19.

Access to Towers and Antennas

- 19.01 Where possible, each Party shall give to the other Party access to towers and antennas under its respective jurisdiction for the purpose of transmitting information recorded in the Meter Facilities. Access shall not be unreasonably denied by either Party.

Article 20.

Relationship to Wastewater Services

- 20.01 Customer and the Board acknowledge that future growth in the System may place additional burdens on their respective wastewater systems. Customer, if it is also a wastewater disposal services customer of the Board, understands that any increase in the volume of water it receives from the System is not a guarantee of increased capacity in the Board's wastewater disposal system.

Article 21.

Construction Standards

- 21.01 The Board shall have the right to review and approve Customer's construction plans for Meter Facilities at new Water Distribution Points, water mains sized twenty-four inches and larger, pump stations, reservoirs, water towers, and any other construction that will cross, or be within close proximity to, or have influence upon the Board's infrastructure. The Board's approval of construction plans shall be timely and shall not be unreasonably withheld.

Article 22.

Operation of Storage

- 22.01 Prior to Customer's operation of any new or existing water storage facility, Customer shall seek the Board's written approval of the filling schedule ("Filling Schedule") of the storage facility. The Board may periodically require Customer to change or adjust a previously approved Filling Schedule. The Parties shall collaborate on devising a mutually beneficial Filling Schedule. If the Parties are unable to agree upon a Filling Schedule, the Board's determination of a Filling Schedule shall be final. All Filling Schedules shall be for a period of six consecutive hours. Customer shall at all times abide by the then-current Board approved Filling Schedule. The Board shall act promptly in approving Filling Schedule requests. Nothing in this Article 22 shall prevent Customer from operating its storage facility at any time, provided that any storage operation that falls outside of the approved Filling Schedule shall not be exempt from the terms of Article 5 herein.

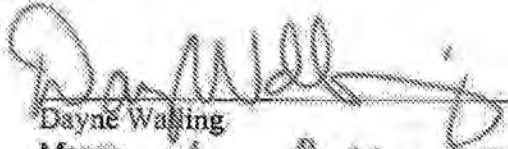
Article 23.
Miscellaneous

- 23.01 If any provision of this Contract or its application to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Contract shall not be affected and shall remain valid and enforceable to the fullest extent permitted by law.
- 23.02 This Contract contains the entire agreement between the Parties and all prior negotiations and agreements are merged into this Contract. Neither Party has made any representations except those expressly set forth in this Contract, and no rights or remedies are, or shall be, acquired by either Party by implication or otherwise unless expressly set forth in this Contract.
- 23.03 Unless the context otherwise expressly requires, the words "herein," "hereof," and "hereunder," and other words of similar import, refer to this Contract as a whole and not to any particular section or subdivision.
- 23.04 The headings of the sections of this Contract are for convenience only and shall not be used to construe or interpret the scope or intent of this Contract or in any way affect the same.
- 23.05 The rights and remedies set forth in this Contract are not exclusive and are in addition to any of the rights or remedies provided by law or equity. This Contract and all actions arising under it shall be governed by, subject to, and construed according to the law of the State of Michigan.
- 23.06 The Great Lakes Water Authority is an acknowledged third party beneficiary to this Contract and this Contract shall not be construed to benefit any persons other than the Board, the Great Lakes Water Authority and Customer.
- 23.07 This Contract may be executed in any number of originals, any one of which shall be deemed an accurate representation of this Contract. Promptly after the execution of this Contract, the Board shall provide a copy to the Customer.
- 23.08 The rights and benefits under this Contract shall inure to the benefit of and be binding upon the respective Parties hereto, their agents, successors, and assigns.
- 23.09 Any and all documents, memoranda, reports, exhibits or other written material referred to in this Contract are and shall be incorporated by reference herein.
- 23.10 This Contract shall be deemed to be mutually drafted.

(Signatures appear on next page)

In Witness Whereof, the City and Customer, by and through their duly authorized officers and representatives, have executed this Contract.

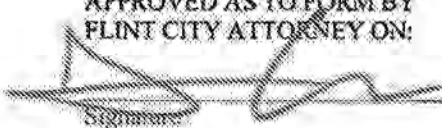
City of Flint:

By: 
Dayne Walling
Its: Mayor
By: 
Natasha L. Henderson
Its: City Administrator

APPROVED BY
FLINT CITY COUNCIL ON:

Authority Granted 10/12/2015
Date

APPROVED AS TO FORM BY
FLINT CITY ATTORNEY ON:

 10/16/15
Signature Date

City of Detroit:

By: 
Sue F. McCormick
Its: Director, Water and Sewerage Department

APPROVED BY DETROIT
BOARD OF WATER COMMISSIONERS ON:

10-14-15
Date

APPROVED AS TO FORM BY
DWSD GENERAL COUNSEL ON:

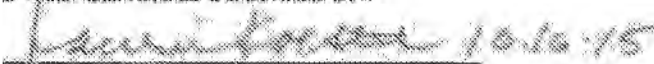
 10.16.15
Signature Date

EXHIBIT A

Customer's Water Distribution Points

This Exhibit contains the following information:

1. The corporate limits of Customer;
2. The agreed upon water Service Area of Customer which (a) may or may not be entirely within the corporate limits of Customer and (b) which may or may not include the entire area within the Customer's corporate limits;
3. The specific location of the Water Distribution Points, including any Board approved emergency connections;
4. The designation of appurtenances to be maintained by Customer and those to be maintained by the Board; and
5. A list of any closed meter locations.

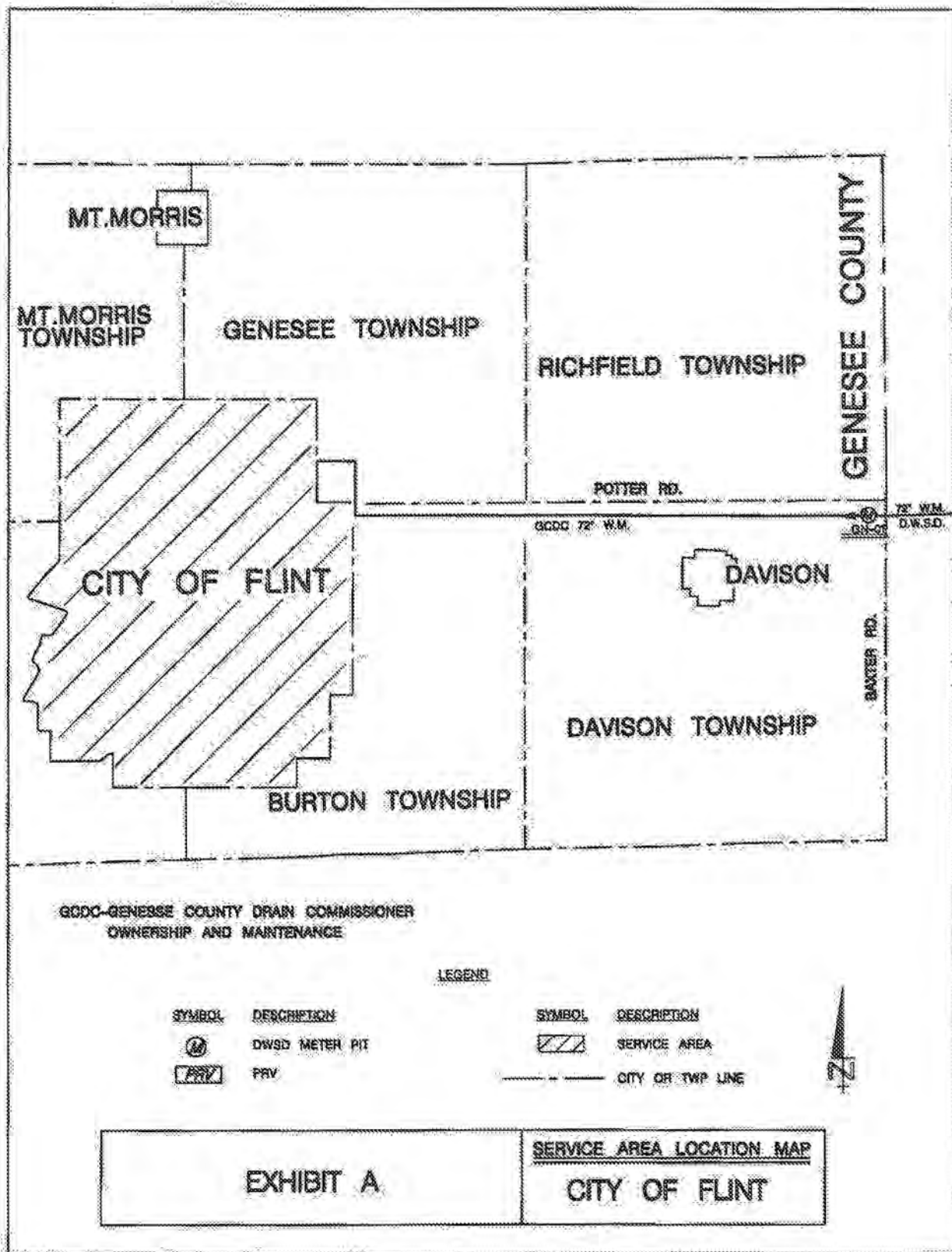


EXHIBIT A**City of Flint Emergency Connections:****City of Flint Water Customers Outside Municipal Limits:**

3148	Augusta St	2509	Flushing Rd
3149	Augusta St	3037	Flushing Rd
1274	N Ballenger Hwy	3039	Flushing Rd
3180	Branch Rd	3047	Flushing Rd
3186	Branch Rd	3061	Flushing Rd
3376	Branch Rd	2122	E Hemphill Rd
3418	Branch Rd	2130	E Hemphill Rd
3450	Branch Rd	2278	E Hemphill Rd
3492	Branch Rd	2288	E Hemphill Rd
2296	W Carpenter Rd	2306	E Hemphill Rd
2340	W Carpenter Rd	2350	E Hemphill Rd
2432	W Carpenter Rd	2414	E Hemphill Rd
2474	W Carpenter Rd	1047	W Hemphill Rd
3014	N Center Rd	3141	Herrick St
3022	N Center Rd	3308	Hull Ave
3030	N Center Rd	3314	Hull Ave
3062	N Center Rd	3319	Hull Ave
3070	N Center Rd	3320	Hull Ave
3080	N Center Rd 1	3342	Hull Ave
3080	N Center Rd 2	3351	Hull Ave
3094	N Center Rd	3272	Menominee Ave
3098	N Center Rd	3276	Menominee Ave
3100	N Center Rd	3281	Menominee Ave
3102	N Center Rd	3289	Menominee Ave
3106	N Center Rd	3295	Menominee Ave
3112	N Center Rd	3299	Menominee Ave
3268	Cheyenne Ave	3300	Menominee Ave
3275	Cheyenne Ave	3303	Menominee Ave
3280	Cheyenne Ave	3304	Menominee Ave
3281	Cheyenne Ave	3309	Menominee Ave
3285	Cheyenne Ave	3312	Menominee Ave
3290	Cheyenne Ave	3313	Menominee Ave
3295	Cheyenne Ave	3316	Menominee Ave
3298	Cheyenne Ave	3317	Menominee Ave
3299	Cheyenne Ave	3326	Menominee Ave
3302	Cheyenne Ave	3330	Menominee Ave
3307	Cheyenne Ave	3335	Menominee Ave

3308	Cheyenne Ave	3343	Menominee Ave
3311	Cheyenne Ave	3344	Menominee Ave
3312	Cheyenne Ave	3348	Menominee Ave
3325	Cheyenne Ave	3349	Menominee Ave
3334	Cheyenne Ave	2036	Nedra
3338	Cheyenne Ave	2052	Nedra
3339	Cheyenne Ave	2058	Nedra
3340	Cheyenne Ave	2070	Nedra
3347	Cheyenne Ave	2100	Nedra
3272	Cheyenne Ave	2126	Nedra
4113	Clio Rd	3024	W Pierson Rd
4243	Clio Rd	2178	Red Arrow Rd
3176	W Court St	3157	Richfield Rd
3189	W Court St	3175	Richfield Rd
4028	W Court St	3217	Richfield Rd
1026	Decamp	1046	Ronlad St
3009	S Dort Hwy	1066	Ronlad St
3043	S Dort Hwy	1069	Ronlad St
3111	S Dort Hwy	3275	Van Slyke Rd
3281	S Dort Hwy	3339	Van Slyke Rd
3342	Fenton Rd	3150	Whitney Ave
		3155	Whitney Ave

City of Flint Master Meters Not In Service:

None.

EXHIBIT-A GN-01 POTTER AND BAXTER CITY OF FLINT

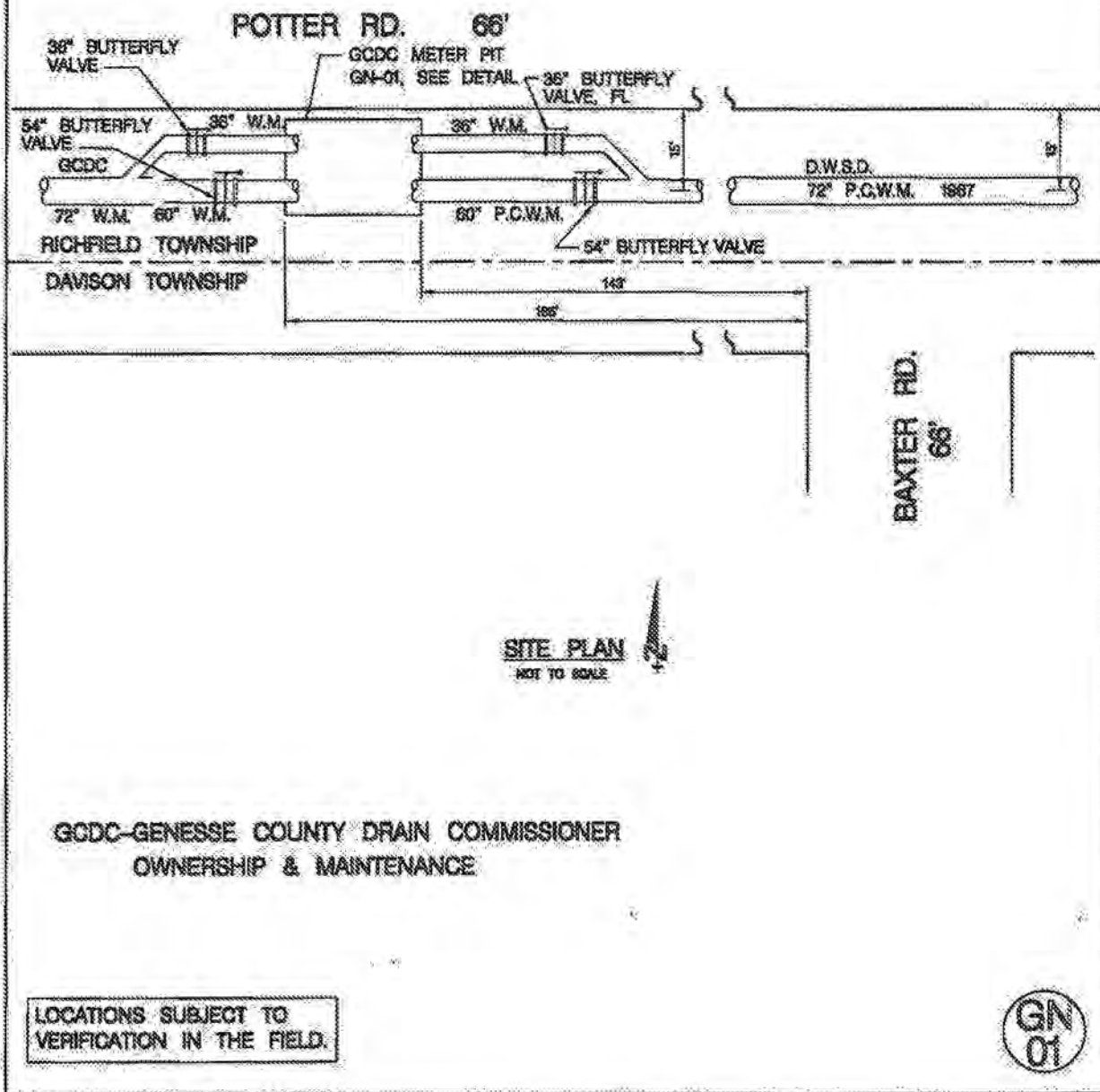
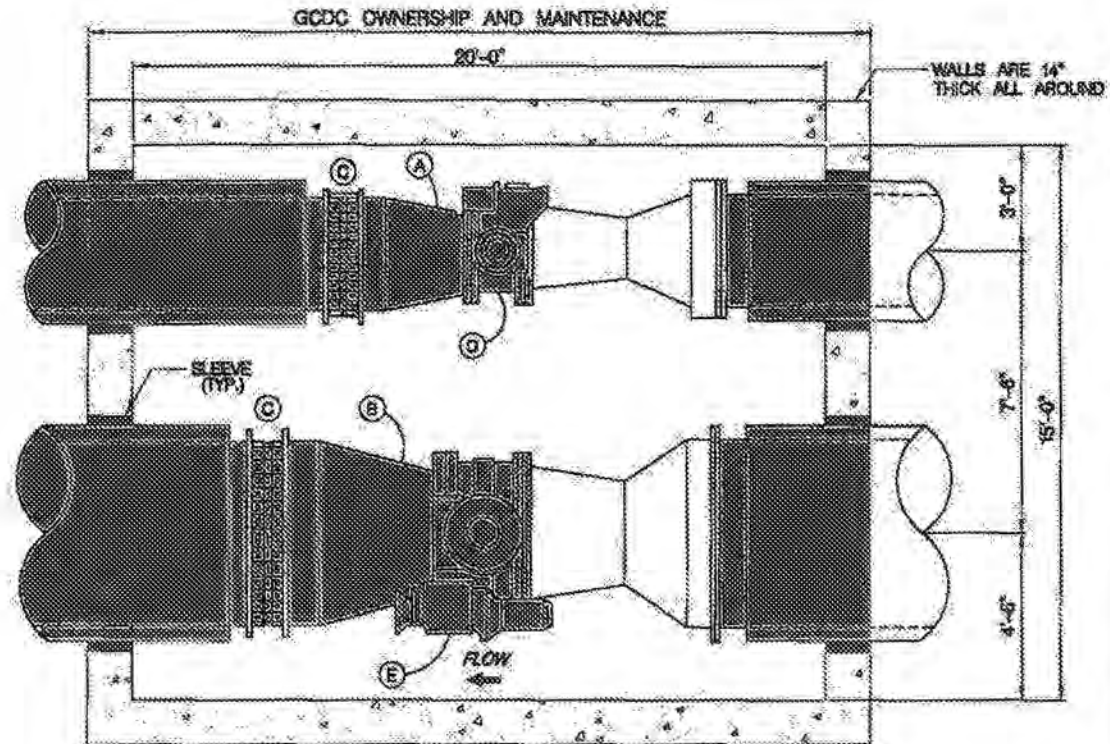


EXHIBIT-A GN-01 POTTER AND BAXTER CITY OF FLINT



METER PIT DETAIL

NOT TO SCALE

GENESEE COUNTY DRAIN COMMISSIONER (GCDC)
OWNERSHIP & MAINTENANCE

LEGEND		
TAG	QTY	DESCRIPTION
A	1	PENN. FLOW TUBE
B	1	PENN. FLOW TUBE
C	2	COUPLING
D	1	MOTOR OPERATED BUTTERFLY VALVE
E	1	MOTOR OPERATED BUTTERFLY VALVE

TYPICAL PRESSURE LOSS THRU METER	
METER TYPE	P.S.I. LOSS
VENTURI	1 - 2
MAG	0
TURBINE	4 - 6

- (P) UPSTREAM PRESSURE TRANSMITTER,
DWSD OWNERSHIP AND MAINTENANCE
LOCATION OUTSIDE VAULT
- (Q) DOWNSTREAM PRESSURE TRANSMITTER,
DWSD OWNERSHIP AND MAINTENANCE
LOCATION OUTSIDE VAULT

ADDRESS _____ 12201 POTTER
FEED TO _____ CITY OF FLINT AND GCDC
FEED FROM _____ D.W.S.D. TRANS. MAIN
TYPE OF METER _____ TWO - PENN FLOW TUBES
SIZE OF METER _____ 80" X 37.406" X 42" 38" X 22" X 30"
TUBE NUMBER _____ 80" 820141 38" 820142
DATE METER SET _____ DECEMBER 14, 1967
METER PIT CONST. & SIZE _____ 20'-0" X 15'-0" I.D. REINF. CONC
REMARKS _____ MANUAL SWITCHOVER

GN
01

EXHIBIT B

Projected Annual Volume and Minimum Annual Volume (Table 1)
Pressure Range and Maximum Flow Rate (Table 2)
Flow Split Assumptions (Table 3)
Addresses for Notice (Table 4)

Table 1 and Table 2 set forth the agreed upon Projected Annual Volumes, Minimum Annual Volumes, Pressure Ranges and Maximum Flow Rates for the term of this Contract provided that figures in bold type face are immediately enforceable pursuant to the terms of Section 5.07 and italicized figures are contained for planning purposes only but will become effective absent the negotiated replacements anticipated in Section 5.07.

The approximate rate of flow by individual meter set forth in Table 3 is the assumption upon which the Pressure Range commitments established in Table 2 have been devised. Should Customer deviate from these assumptions at any meter(s), the Board may be unable to meet the stated Pressure Range commitments in this Contract or in the contract of another customer of the Board and Section 5.08 of this Contract may be invoked.

EXHIBIT B

Table 1
Projected Annual Volume and Minimum Annual Volume

Fiscal Year Ending June 30	Projected Annual Volume (Mcf)	Minimum Annual Volume (Mcf)
2016	593,000	296,500
2017	593,000	296,500
2018	TBD	TBD
2019	TBD	TBD
2020	TBD	TBD
2021	TBD	TBD
2022	TBD	TBD
2023	TBD	TBD
2024	TBD	TBD
2025	TBD	TBD
2026	TBD	TBD
2027	TBD	TBD
2028	TBD	TBD
2029	TBD	TBD
2030	TBD	TBD
2031	TBD	TBD
2032	TBD	TBD
2033	TBD	TBD
2034	TBD	TBD
2035	TBD	TBD
2036	TBD	TBD
2037	TBD	TBD
2038	TBD	TBD
2039	TBD	TBD
2040	TBD	TBD
2041	TBD	TBD
2042	TBD	TBD
2043	TBD	TBD
2044	TBD	TBD
2045	TBD	TBD

EXHIBIT B

Table 2
Pressure Range and Maximum Flow Rate

Calendar Year	Pressure Range (psi)		Maximum Flow Rate (mgd)	
	Meter GN-01		Max Day	Peak Hour
	Min	Max		
2015	40	60	21.40	22.40
2016	40	60	21.40	22.40
2017	40	60	TBD	TBD
2018	40	60	TBD	TBD
2019	40	60	TBD	TBD
2020	40	60	TBD	TBD
2021	40	60	TBD	TBD
2022	40	60	TBD	TBD
2023	40	60	TBD	TBD
2024	40	60	TBD	TBD
2025	40	60	TBD	TBD
2026	40	60	TBD	TBD
2027	40	60	TBD	TBD
2028	40	60	TBD	TBD
2029	40	60	TBD	TBD
2030	40	60	TBD	TBD
2031	40	60	TBD	TBD
2032	40	60	TBD	TBD
2033	40	60	TBD	TBD
2034	40	60	TBD	TBD
2035	40	60	TBD	TBD
2036	40	60	TBD	TBD
2037	40	60	TBD	TBD
2038	40	60	TBD	TBD
2039	40	60	TBD	TBD
2040	40	60	TBD	TBD
2041	40	60	TBD	TBD
2042	40	60	TBD	TBD
2043	40	60	TBD	TBD
2044	40	60	TBD	TBD

EXHIBIT B

Table 3
Flow Split Assumptions

Meter	Assumed Flow Split (2015-2016)
GN-01	100%

Table 4
Addresses for Notice

If to the Board:	If to Customer:
Director Detroit Water and Sewerage Department 735 Randolph Street Detroit, Michigan 48226 Attention: General Counsel	Mayor City of Flint 1101 S. Saginaw Street Flint, Michigan, 48502 Attention: City Attorney

EXHIBIT C

Metering Agreement Between City of Flint and Genesee County Drain Commissioner

LICENSE TO TRANSMIT WATER

This License to Transmit Water ("License") entered into on October 14, 2015, (the "License Date" and "Effective Date") is made between the City of Flint, a Home Rule City (the "City"), and the Genesee County Drain Commissioner, as County Agency, a county agency pursuant to the County Public Improvement Act 342 of 1939, as amended, ("GCDC"). The City and GCDC may be referred to individually as a "Party" or collectively as the "Parties."

RECITALS

WHEREAS, the City has requested the Detroit Water and Sewerage Department ("DWSD") to provide the City with potable water; and

WHEREAS, DWSD water distribution system has no physical connection to the City water distribution system; and

WHEREAS, GCDC is currently purchasing potable water from DWSD and GCDC is receiving DWSD water at the water meter GN-01 near Baxter and Potter Roads, located in Genesee County and more fully set forth in Exhibit 1 (hereinafter known as "GCDC/DWSD Connection"); and

WHEREAS, GCDC has a physical connection to the City water distribution system near Center Road and Pierson Road in Genesee Township, Genesee County, Michigan, which is more fully set forth in Exhibit 2 (hereinafter known as "GCDC/City Connection"); and

WHEREAS, GCDC owns nine (9) miles of water transmission pipeline ("Pipeline") that connects the GCDC/DWSD Connection to the GCDC/City Connection; and

WHEREAS, GCDC has the ability to allow Flint to transmit water through the Pipeline from the GCDC/DWSD Connection to the GCDC/City Connection so DWSD may service the City with DWSD-treated potable water; and

WHEREAS, this License shall govern the terms and conditions of Flint transmitting water through the Pipeline from the DWSD/GCDC Connection to the GCDC/City Connection; and

WHEREAS, the Parties hereto acknowledge and agree that DWSD may assign its contract to provide potable water to the City to another entity, including, but not limited to, the Great Lakes Water Authority, and, if DWSD assigns its contract to provide water to the City, all reference to DWSD in this License shall be replaced by the party to whom DWSD assigns its contract.

NOW, THEREFORE, THIS LICENSE is hereby made and mutually entered into by the City and GCDC for the mutual consideration stated herein and the Parties agree to the following:

1. Adoption of Recitals. All of the matters stated in the Recitals of this License are true and correct and are hereby incorporated into the body of this License as though fully set forth in their entirety herein. However, in cases of conflict, provisions of this License shall prevail over the matters stated in the Recitals.

2. **Contract for Water.** As a condition precedent to this License being effective, the City shall enter into a contract with DWSD for DWSD to supply the City with water and said contract shall require the City to pay DWSD directly for all water consumed by the City and any applicable charges, fees, or other amounts charged by DWSD. The City shall hold GCDC harmless from any and all debts the City incurs from receiving water from DWSD and any and all costs that DWSD may impose on GCDC as a result of the City receiving water from DWSD.

3. **Term.** The Parties hereto understand and acknowledge that GCDC needs the Pipeline to transmit its potable water to its customers once GCDC starts receiving raw water from KWA. The Parties agree and acknowledge that this License shall expire sixty (60) days after the City has received notice from KWA that raw water is available for the City for treatment; however, the City may request GCDC to extend this License until GCDC starts receiving raw water from KWA. The City shall not transmit water through the Pipeline after GCDC begins to transmit its potable water to its customers. The City acknowledges and consents to GCDC terminating any water transmission in the Pipeline for the benefit of the City once GCDC begins to produce and sell its potable water to its customers. The City may terminate this License by providing GCDC with thirty (30) days written notice of termination.

4. **Consideration.** In exchange for GCDC allowing the City to transmit water through the Pipeline, the City shall pay GCDC one dollar (\$1.00) per month for the term of this License. The City is allowed to pay the first nine (9) months in a lump sum payment.

5. **Meters and Billing.** The City hereby grants GCDC complete access to and upon verbal request by GCDC complete control of Station 2, including, but not limited to, all meters, valves, structures, and appurtenances until the Karegnondi Water Authority ("KWA") has notified the City that water is available to the City for treatment or GCDC has provided the City with thirty (30) days notice that GCDC no longer requires access to Station 2. GCDC shall have the meter calibrated within fifteen (15) days of the execution of this License and all costs for the calibration shall be the responsibility of the City. The City shall be entitled to all data, meter reads, and other information that is collected by GCDC at Station 2. The City shall be responsible for all utility costs associated with the operation of Station 2. The City shall be responsible for all repairs to the meter and meter pit. GCDC shall notify DWSD of the monthly meter read for Station 2.

6. **Transmission of Water.** GCDC shall use reasonable diligence to allow the City regular and uninterrupted transmission of water through the Pipeline from the GCDC/DWSD Connection to the GCDC/City Connection; however, Flint shall hold harmless and indemnify GCDC for any damages, breach of contract, or otherwise for interruption of service or curtailment of supply for any cause beyond the control of GCDC. These could include, but are not limited to, Acts of God, strikes, lockouts or other industrial disturbances, acts of public enemy, orders of any kind of the Government of the United States or the State, or any civil or military authority, insurrection, riots, epidemics, landslides, lightning, earthquake, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, partial or failure of the Pipeline or appurtenances. The City shall further hold GCDC harmless from any claim for damages related to continuity of service by third parties, including DWSD, for GCDC's inability to allow the transmission of water due to any cause beyond the control of GCDC.

7. **Water Quality.** The City shall hold GCDC harmless from any water quality related claim for damages by third parties, including DWSD, served by the City, which are asserted against, or are imposed upon or incurred by GCDC and which result from, relate to, or arise out of a claim regarding the treatment of water or the quality of water.

8. **Volume Available.** The City shall hold GCDC harmless in the event that DWSD cannot meet the volume demands of both GCDC and the City. GCDC shall be entitled to receive the quantity of water requested by GCDC and the City shall be entitled to any remaining volume of water. The City shall notify GCDC daily of its anticipated water volume for that day and GCDC shall be responsible for notifying DWSD of the water volume demands for both GCDC and the City.

9. **Pipeline Malfunction.** If the Pipeline shall malfunction for any reason while the City is transmitting water through the Pipeline, GCDC shall notify the City within two (2) hours of verifying the Pipeline malfunction. Thereafter, the malfunction shall be promptly repaired by GCDC and a detailed invoice for one-half (1/2) of the total cost of the repair shall be submitted to the City. The City shall have thirty (30) calendar days to process and authorize the payment for the repair to GCDC. Payment shall be made to GCDC within thirty-two (32) calendar days by either check or wire transfer. Wire transfer instructions are available from the GCDC Chief Financial Officer. The City shall indemnify and hold GCDC harmless for any and all claims from the City or third parties that relate to the City not being able to supply water to its customers due to the malfunction.

10. **Severability.** The Parties hereto specifically agree that in case any one or more of the sections, subsections, provisions, clauses or words of this License or the application of such sections, subsections, provisions, clauses or words to any situation or circumstance should be, or should be held to be, for any reason, invalid or unconstitutional, under the laws or constitutions of the State or the United States of America, or in contravention of any such laws or constitutions, such invalidity, unconstitutionality or contravention shall not affect any other sections, subsections, provisions, clauses or words of this License or the application of such sections, subsections, provisions, clauses or words to any other situation or circumstance, and it is intended that this License shall be severable and shall be construed and applied as if any such invalid or unconstitutional section, subsection, provision, clause or word had not been included herein, and the rights and obligations of the Parties hereto shall be construed and remain in force accordingly.

11. **Governing Law and Venue.** It is specifically agreed among the Parties to this License that Genesee County, State of Michigan is the place of performance of this License. In the event that any legal proceeding is brought to enforce this License or any provision hereof, the same shall be brought in the Genesee County Circuit Court.

12. **Interpretation and Construction.** For purposes of interpretation and construction of this License, both the City and GCDC shall be deemed to have been the drafter of this License and this License shall not be construed against any Party to this License.

13. **Modification.** This License shall not be modified, altered, or amended except through a written amendment signed by the Parties.

14. **No Third Party Beneficiaries.** This License is not intended to confer upon any person or entity, other than the Parties hereto, any rights or remedies of any kind or nature whatsoever.

15. **Notices.** Other than invoices and payments, any notice, communication, request, reply or advice (herein severally and collectively, for convenience, called "Notice") herein provided or permitted to be given, made or accepted by any Party to any other Party must be in writing and may be given or be served by depositing the same in the United States mail postpaid and registered or certified and addressed to the Party to be notified, with return receipt requested, or by delivering the same to an officer of such Party, or by prepaid telegram when appropriate, addressed to the Party to be notified. Notice deposited in the mail in the manner described above shall be conclusively deemed to be effective, unless otherwise stated herein, from and after the expiration of three (3) days after it is so deposited. Notice given in any other manner shall be effective only if and when received by the Party to be notified. For the purposes of notice, the addresses of the Parties shall, until changed as hereinafter provided, be as follows:

To GCDC: Genesee County Drain Commissioner's Office, Division of Water and Waste Services, G-4610 Beecher Road, Flint, Michigan 48532.

To the City: City of Flint, 1101 South Saginaw Street, Flint, Michigan 48502.

The Parties hereto shall have the right from time to time and at any time to change their respective addresses and each shall have the right to specify as its address any other address by at least fifteen (15) days written notice to the other Party hereto.

IN WITNESS WHEREOF, the Parties hereto acting under authority of their respective governing bodies have caused this License to be duly executed in several counterparts, each of which shall constitute an original, all as of the day and year first above written, which is the License and Effective Date.

GCDC:

By: Jeff Wright

Its: Drain Commissioner

CITY:

By: Natasha Henderson

Its: City Administrator

By: Dayne Welling

Its: Mayor

Attest:

By:

By:

This License was prepared by:
 Attorney Kevin Kilby (P68599)
 McGraw Morris P.C.
 2075 West Big Beaver Road
 Suite 750
 Troy, Michigan 48064
 Phone: (248) 502-4000
 Facsimile: (248) 502-4001
 Email: kkilby@mcgrawmorris.com

Approved as to form by:

Peter M. Bade (P47896)

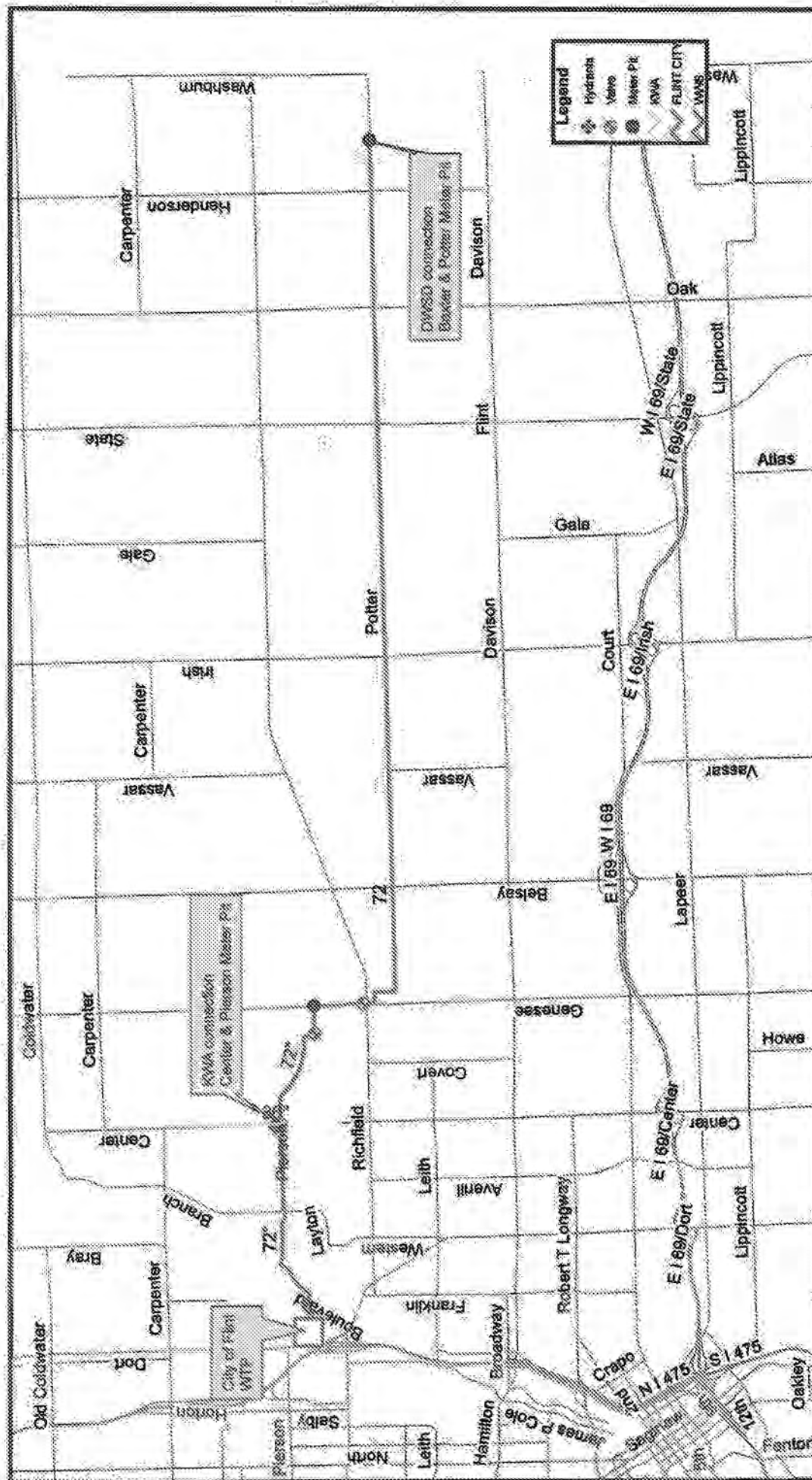
Chief Legal Officer

City of Flint

1101 South Saginaw Street, Room 307

Flint Michigan 48502

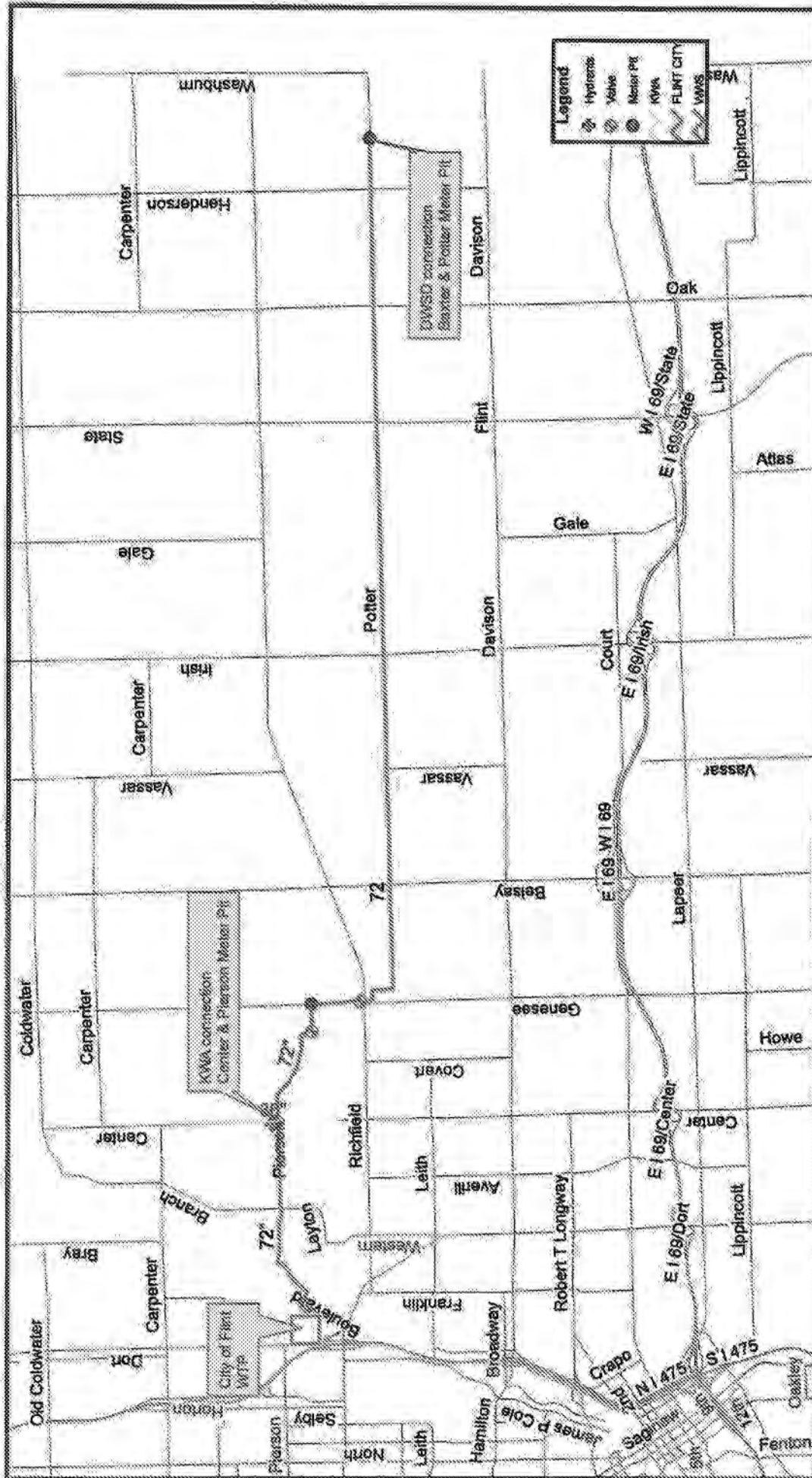
Exhibit 1
Location of CCDC/DWSD Connection



1 inch $\approx$ 5,000 feet

10/15/2015

Exhibit 2
Location of GCDC/Flint



From: Sygo, Jim (DEQ)
Sent: Monday, October 19, 2015 4:34 PM
To: McDonald, Paul (DEQ)
Subject: Fwd: City of Flint Wire Transfer Routing Information

Paul,
I have suggested
January 15, 2016
And
April 15, 2016.

Sent from my iPhone

Begin forwarded message:

From: Jody Lundquist <jlundquist@cityofflint.com>
Date: October 19, 2015 at 4:20:37 PM EDT
To: "McDonald, Paul (DEQ)" <mcdonaldp@michigan.gov>
Cc: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, Natasha Henderson
<nhenderson@cityofflint.com>
Subject: Re: City of Flint Wire Transfer Routing Information

Fantastic. \$8 million was wire transferred to DWSD this afternoon bringing the total held in escrow for benefit of the City's account to \$10 million pursuant to the service agreement with DWSD. Thank you for your efforts in assisting the City to obtain this partial payment of the State's pledged support so quickly.

We look forward to working with you to provide the required billing documentation in advance of the next \$2 million disbursement in January. Assuming open communication between now and then and upon receipt of the required documentation, what are the anticipated disbursement dates so that all of our calendars may be synced?

Thanks again,

Jody N. Lundquist
Chief Financial Officer
City of Flint
1101 S. Saginaw Street, 2nd Floor
Flint, MI 48502
jlundquist@cityofflint.com
(810) 766-7268 ext. 2301

On Mon, Oct 19, 2015 at 3:56 PM, McDonald, Paul (DEQ) <mcdonaldp@michigan.gov> wrote:
Jody,

I have not received a printed confirmation yet, but my Treasury Department has confirmed the wire was sent.

Let me know if you have any questions.

Paul

Sent from my Samsung S5

----- Original Message -----

From: Jody Lundquist <jlundquist@cityofflint.com>

Date: Mon, October 19, 2015 1:25 PM -0400

To: "McDonald, Paul (DEQ)" <mcdonaldp@michigan.gov>

CC: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, Natasha Henderson <nhenderson@cityofflint.com>

Subject: City of Flint Wire Transfer Routing Information

Please see the wire transfer routing information below.

Bank Name : JPMorgan Chase

Routing #: PPI

Acct #: PPI

Account Name: Commercial Account

Contact: Amanda Trujillo

Amount: \$2 million

Please let me know if you have any questions or if I may be of any assistance.

Thank you,

Jody N. Lundquist

Chief Financial Officer

City of Flint

1101 S. Saginaw Street, 2nd Floor

Flint, MI 48502

jlundquist@cityofflint.com

(810) 766-7268 ext. 2301

From: Sygo, Jim (DEQ)
Sent: Tuesday, October 20, 2015 8:43 AM
To: Shaler, Karen (DEQ)
Subject: FW: Flint
Attachments: DelToral_etal_EST_2013.pdf; DelToral_etal_EST_2013_SI.pdf

When you get a chance can you try to open and print these papers

From: Dykema, Linda D. (DHHS)
Sent: Tuesday, October 20, 2015 8:04 AM
To: Krisztian, George (DEQ); Edgerton, Shelly (LARA); Sygo, Jim (DEQ)
Subject: FW: Flint

Del Toral paper attached with supporting data

Detection and Evaluation of Elevated Lead Release from Service Lines: A Field Study

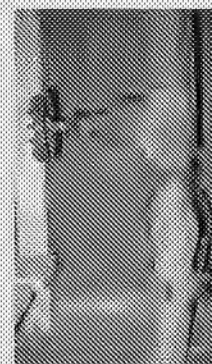
Miguel A. Del Toral,^{*,†} Andrea Porter,[†] and Michael R. Schock[‡]

[†]U.S. Environmental Protection Agency, Region 5, GWDWB, 77 West Jackson Boulevard, Chicago, Illinois 60604, United States

[‡]U.S. Environmental Protection Agency, ORD, NRMRL, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268, United States

Supporting Information

ABSTRACT: Comparative stagnation sampling conducted in 32 homes in Chicago, Illinois with lead service lines demonstrated that the existing regulatory sampling protocol under the U.S. Lead and Copper Rule systematically misses the high lead levels and potential human exposure. Lead levels measured with sequential sampling were highest within the lead service lines, with maximum values more than four times higher than Chicago's regulatory compliance results using a first-draw sampling protocol. There was significant variability in lead values from different points within individual lead service lines and among different lead service line sites across the city. Although other factors could also influence lead levels, the highest lead results most often were associated with sites having known disturbances to the lead service lines. This study underscores the importance and interdependence of sample site selection, sampling protocol, and other factors in assessing lead levels in a public water system.



INTRODUCTION

Background. Most lead in drinking water comes from premise plumbing materials and lead service lines (LSLs). LSLs are generally the largest source of lead in drinking water when they are present in public water systems.¹ The 1986 Safe Drinking Water Act Amendments banned new lead pipes in the potable water network, but a legacy of millions of partial or whole LSLs remains in many public water systems.² Where the term "lead corrosion" is used, it refers to the corrosion of lead plumbing materials that result in the transfer of dissolved or particulate lead into the drinking water.

The Lead and Copper Rule (LCR) sampling is intended to measure the lead levels in drinking water to assess the effectiveness of corrosion control treatment utilized by public water systems (PWSs) to minimize lead in drinking water. PWSs are required to use sampling sites that are presumed to be the highest-risk sites for lead release, and to optimize corrosion control to minimize lead levels at consumers' taps. Most published sampling studies typically focus on systems having high lead levels or systems that have experienced challenges in attempting to balance LCR compliance with various other treatment or water quality objectives. Except for LCR compliance data, little published data exists or is available for systems that are considered to be operating with optimal corrosion control and meeting the lead action level (AL) in the LCR. This study focuses on a system that is considered to have optimized corrosion control using a blended phosphate, with a relatively stable water quality, and compliance results historically well below the lead AL. This situation is representative of a large percentage of systems serving 100,000 or more people that utilize orthophosphate or blended phosphates for corrosion control and the vast majority of

systems are meeting the lead AL based on the current sampling protocol in the LCR. Additional information on the LCR and study is available in the Supporting Information (SI). This study focused on whether (1) the current LCR compliance sampling protocol adequately captures the peak lead levels in a water system; (2) "preflushing" (PF) results in capturing lower lead levels in samples compared to samples collected under normal household usage (NHU) conditions; (3) a first-draw sampling protocol appropriately determines the adequacy of optimal lead corrosion control in water systems with LSLs; and (4) there is seasonal variability in the sampling results using the different sampling protocols.

System Information. The Chicago Department of Water Management (CDWM) operates two similar conventional surface water filtration treatment plants serving approximately 5.4 million residents, including those in 125 suburbs. Lake Michigan is the sole water source, with relatively stable water quality leaving the treatment plants and in the distribution system (Table 1). Before the LCR, CDWM utilized pH/alkalinity adjustment for corrosion control. CDWM switched to a proprietary blended phosphate at both plants between 1993 and 1994 which is still used as the primary corrosion control treatment.

The LCR requires public water systems to collect lead samples using a first-draw (FD) sampling protocol, and samples were collected almost exclusively from single-family homes with LSLs as required by the LCR sample site selection require-

Received: January 23, 2013

Revised: June 24, 2013

Accepted: July 23, 2013

Published: July 23, 2013

Table 1. Water Quality Data 2011

parameter	outlets		distribution	
	min	max	min	max
temp (°C)	4	24	5	23
turbidity (NTU)	0.1	0.2	0.1	0.4
pH	7.5	7.8	7.7	7.8
Cl ₂ residual (mg/L)	1.0	1.2	0.7	0.9
total alkalinity (mg/L as CaCO ₃)	103	108	98	108
chloride (Cl, mg/L)	16	20	17	20
sulfate (mg/L)	29	31	29	30
Ca (mg/L)	34	39	34	39
PO ₄ (mg/L)	0.4	0.6	0.5	0.5
total PO ₄ (mg/L)	0.8	1.1	0.8	1.2
Al (μg/L)	34	126	29	113
Fe (μg/L)	<5	<5	<5	34
Mn (μg/L)	<3	<3	<3	<3

ments.³ Since the initial LCR monitoring, Chicago has exceeded the lead AL only once, during July–December 1992, with an average 90th percentile compliance monitoring value between 1999 and 2010 of 6 μg/L (SI Table S2).³

The LCR requires 1-L, FD tap samples of water that has stood motionless in the plumbing system (i.e., has stagnated within the plumbing) for at least 6 h. The two variants of the FD sampling protocol currently used by public water systems are defined herein as the NHU first-draw sample, where water is used in a normal household manner, and then allowed to sit motionless in the plumbing for at least 6 h before the sample is collected; and the PF first-draw sample, where the water is run from the sampling tap for a specified amount of time immediately prior to the stagnation period. However, the LCR does not provide specific details on water use during the stagnation period.

Almost all PWSs in the U.S. rely on residents to collect compliance samples under the LCR and there are differences across the U.S. in how systems instruct residents not to use the water during the stagnation period prior to collecting the sample. A review of example sets of sampling instructions provided to residents by large PWSs in the U.S. found that some are instructed not to use any water *from the tap to be sampled* during the stagnation period. Others are instructed not to use *any water in the household*. Prior to 2009, CDWM used the PF first-draw sampling protocol, with a 5-min preflush preceding stagnation. Recent instructions to residents included not using water from the sampling tap or from any nearby tap until the (poststagnation) samples were collected, and to collect samples as soon as possible after the minimum required 6-h stagnation period. Regardless of the sampling protocol, resident-collected samples necessitate the use of simple instructions and make it difficult to ensure strict adherence to any sampling protocol. In addition, the diverse premise plumbing materials and configurations (SI Table S1) represent varying effects of flow rates, hydraulic flow characteristics, and possible lead sorption/particle release effects on the shapes of the lead profiles, particularly with corroded galvanized pipe locations.^{4,5}

MATERIALS AND METHODS

Sampling Objectives and Protocol. Since the promulgation of the LCR, new research on lead corrosion has shown that there are many mechanisms and water quality factors

involved.^{1,4,6–11} Specifically, the sampling protocols used in this study were evaluated to determine if

- preflushing biases results;
- first-draw samples, with or without preflushing, capture the “worst-case” level of lead corrosion under normal use conditions; and
- seasonal variability affects lead concentrations (in this water system).

Consistent with the LCR requirements and CDWM compliance sampling, samples for this study were collected by volunteer residents from 32 single-family residences, built between 1890 and 1960, with LSLs. An additional 5 homes were sampled and determined not to have LSLs, and were therefore excluded from further sampling. All results are included in the Supporting Information, but the non-LSL sites were not used in the data analysis (SI Tables S4a, S5, S6a, S6b, and S7).

Information was requested on the specific plumbing configurations of each sampling site to a much greater extent than the regulatory requirements which simply require the plumbing material to be identified. This information, along with analyses conducted for lead, copper, iron, and zinc for each sample, facilitated a better understanding of the observed water lead levels. Residents were asked to (1) complete a plumbing profile identifying the kitchen tap and meter or internal shut-off valve, and (2) describe the internal plumbing, including any recent plumbing work (SI Figure S1). The information provided by residents along with the results of the four metals provided additional information on the sequences of plumbing materials, and the presence of in-line brass plumbing components. CDWM provided the locations of water mains, service line materials, work conducted by the city at each residence (meter installation or repair, shut-off valve repair/replacement, service line leak repair, street excavation), and monthly water use data for residences with water meters. The information provided by CDWM on water main locations was used to measure the distance from the water main to each residence, and internal plumbing information provided by residents was used along with the measured length from the water main to the residence to approximate the LSL length (SI Table S1).

Residents were provided with written sampling and reporting instructions for each sampling event (SI Figures S41–S45). One-liter, high-density polyethylene (HDPE), wide-mouth (5.5 cm, 2.2 in.) sample bottles were used to collect all samples. Residents were instructed not to remove aerators prior to sampling and not to collect samples after point-of-use or point-of-entry treatment devices.

Several prior studies have suggested that significant contributions of particulate-associated lead can be mobilized as a function of flow rate and turbulence in certain water chemistries, though studies have not developed predictive relationships to premise plumbing material, scale composition, and hydraulic flow characteristics.^{6,10–15} To try to achieve the most aggressive high flow conditions under realistic field conditions, residents were instructed to collect all samples by slowly opening the cold water kitchen tap until fully open. Upon receipt, the samples were inspected by EPA for visible particulate matter prior to delivery to the laboratory.

For all first-draw samples, residents were instructed not to use any water throughout the household (i.e., no showering, washing clothes/dishes, flushing toilets, etc.) during the

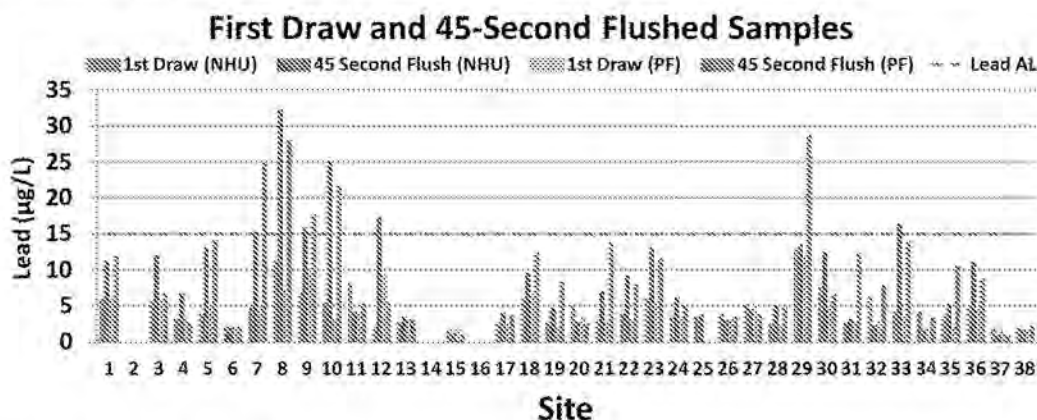


Figure 1. First round lead results for all sites.

minimum mandatory 6-h stagnation period. In this study, PF samples include a flush of at least 5 min prior to the mandatory minimum 6-h stagnation period. A NHU sample had no preflushing prior to the mandatory minimum stagnation period. Residents were instructed to allow the water to sit motionless in the household plumbing a minimum of 6 h, but not more than 24 h, and to record the dates/times the taps were flushed prior to the stagnation period, and the dates/times samples were collected following the stagnation period. First-draw samples using both variants (NHU and PF) were collected in the first and third rounds of monitoring in March/April and September/October, respectively. Additionally, 45-s flushed samples were collected in the first round to evaluate whether a second-draw sample more accurately captured the level of corrosion. Three-min, 5-min, and 7-min flushed samples were collected in the third round of sampling to provide guidance to volunteers when high lead levels were found (SI Table S7). This information can also be used to provide site-specific guidance on minimum flushing times necessary to reduce consumer exposure to lead in drinking water.

In the first round of sampling, each resident collected a NHU first-draw sample and then a second-draw (45-s flushed) sample after allowing the water to run for 45 s. On the second day, residents collected a PF first-draw sample and then a second 45-s flushed sample. EPA's current Public Notification Handbook advises¹⁶ residents to run the water 30 s or until it turns cold before consuming, if the water has not been used for an unspecified "extended period of time", which can result in higher lead levels at the tap for consumers. It has also been previously demonstrated that in some situations, this advice can cause residents to consume the worst-case water sitting stagnant in the LSL.¹⁷ (Figure 1)

Sites 14, 15, 16, and 37 were verified as not having LSLs and were excluded from further sampling. Site 2 was verified as not having a LSL following the June sequential sampling and was excluded from the final round of monitoring. The 45-s flushed sampling was discontinued following the March/April sampling first round due to the presence of severely corroded galvanized pipe in some of the residences (SI Figure S4) which reduced the inner pipe diameter, restricting water flow and resulting in varying volumes of water flowing through the plumbing for the same flush time.

In June 2011, each resident collected a total of twelve PF sequential samples in one day of sampling. The first PF sequential sample was also the PF first-draw sample for the data analysis. All samples were analyzed for lead, copper, zinc, and

iron. The co-occurrence of the metals, along with plumbing details, was used in qualitative assessments to correlate lead results with potential sources of lead in the plumbing network (SI Figure S6).^{4,10}

In September/October 2011, each resident collected a NHU first-draw sample, and a minimum of 11 PF sequential 1-L samples. Sites with high lead levels in the previous rounds collected an additional 3 or 4 PF sequential samples, and one site with a very long LSL (159 ft, 48 m) collected an additional 9 PF sequential samples. The additional PF sequential samples were collected to determine the point at which lead levels consistently dropped below the AL. All samples collected are included in the sampling summary with the numbers and types of samples collected at each site (SI Table S3).

Most stagnation times were relatively consistent across most sites at between 6 and 8.5 h, and all but two sites had stagnation times between 6 and 9 h 10 min, which facilitated unadjusted comparisons (SI Table S6c).

Additional flushed samples were collected in September/October for high lead sites in order to provide residents with guidance on minimizing lead levels in their drinking water. Recommended minimum flushing times were then estimated based on the lead levels and LSL lengths. These results are included in the Supporting Information, but not discussed here.

Sample Analyses. All samples were visually inspected for particulate matter prior to delivery to the EPA Chicago Regional Laboratory. Samples were preserved upon receipt by the laboratory using concentrated nitric acid to pH <2 and held for a minimum of 24 h prior to analysis.¹⁸ The laboratory's Reporting Limits (RL) for lead, copper, and zinc in drinking water samples, using EPA Method 200.8, are 0.5, 1, and 10 µg/L, respectively. The laboratory's RL for iron in drinking water samples, using EPA Method 200.7, is 80 µg/L. Additional laboratory information is included in the Supporting Information.

RESULTS AND DISCUSSION

Both Variants of the First-Draw Protocol Significantly Underestimated Peak Lead Levels, and the NHU First-Draw Protocol Yielded Higher Results Overall than the PF First-Draw Protocol. The 90th percentile lead values for all three rounds of first-draw sampling using both variants were slightly higher than Chicago's historical compliance results, but still fell well below the lead AL (SI Table S4b). Only 2% of the total number of first-draw samples (3 of 151) exceeded the AL despite the presence of lead levels well above the lead action

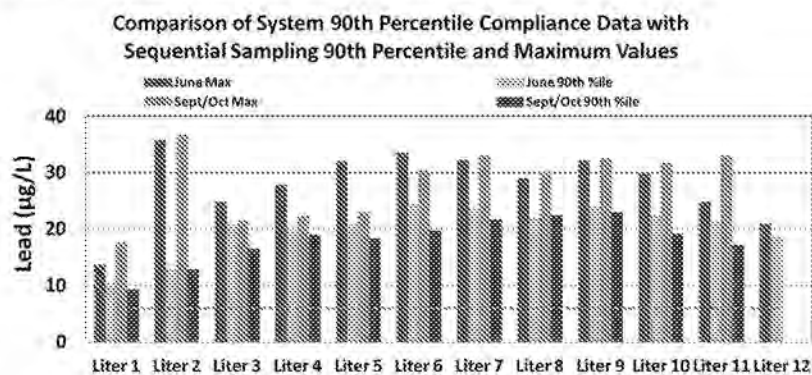


Figure 2. Comparison of 90th percentile LCR compliance data to 90th percentile values from LSL samples (across sites by liter) and maximum values from LSLs. The green dashed line indicates the average 90th percentile compliance monitoring value for Chicago between 1999 and 2010 of 6 $\mu\text{g/L}$.

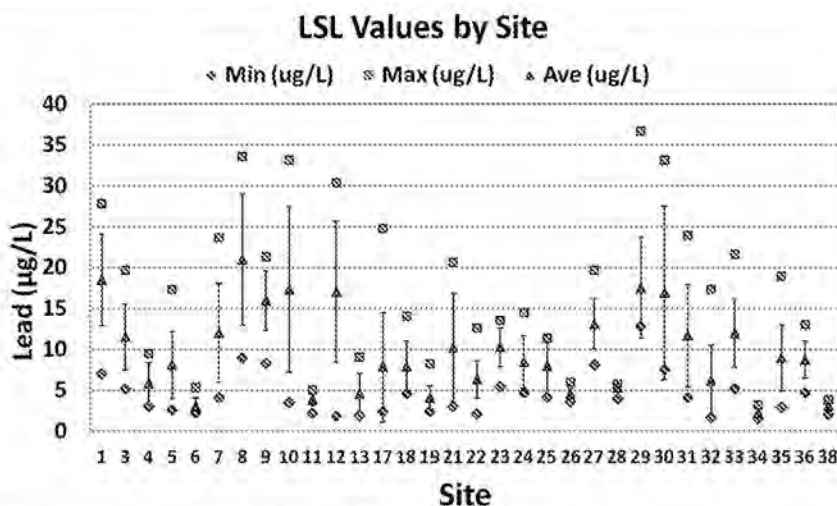


Figure 3. LSL results were highly variable within each LSL and from site to site. Error bars represent 1 standard deviation.

level within the service lines as indicated by the 45-s flushed results in the first round of monitoring and sequential sampling results in the second and third rounds.

In contrast, if the 90th percentile value of each of the successive sequential liter samples from the LSLs is computed across all sampling sites, the lead levels were up to four times higher than Chicago's average 90th percentile value using FD samples. Some peak values for each sequential liter calculated across all sampling sites were over twice the lead AL and up to six times higher than the regulatory compliance data (Figure 2). In summary, 69 of 336 (21%) of the individual sequential samples collected in June and 75 of 319 (24%) of sequential samples in September/October exceeded the lead AL, indicating that current sampling protocols will often considerably underestimate the peak lead levels and overall mobilized mass of waterborne lead in a system with lead service lines.

The NHU results were numerically higher overall than the corresponding PF values for most sites, but the differences were not statistically significant. The PF first-draw protocol produced lower individual results than NHU first-draw protocol in 23 of 32 sample pairs in March/April, and 20 of 27 sample pairs in Sept/Oct (SI Table S4a). Although NHU first-draw samples were collected without directing the residents to flush the tap prior to the stagnation period, NHU can involve showering, washing dishes, or doing laundry a short time prior to the stagnation period, which could clear the lead from the pipes

similar to preflushing the tap. Thus a NHU sample can be effectively the same as a PF sample and yield similar results. Since the sequential sampling results from these same sites show that there is much higher lead present within the LSL at the same time that the NHU and PF first-draw samples were collected, it stands to reason that if the NHU activities were not undertaken, and a larger sample set were used, the NHU samples would yield results that were statistically higher than the corresponding PF samples. The distance from the kitchen tap to the beginning of the LSL was highly variable, ranging from approximately 3 to 87 feet (0.9 to 27 m), and the measured LSL lengths ranged from 43 to 159 feet (13 to 48 m). Consequently, for sites with shorter total plumbing lengths, the initial and final sequential samples would include relatively uncontaminated water from the water main following the 5-min tap preflushing. These samples would contain little to no LSL lead contribution, consistent with plumbosolvency and radial diffusion/flow principles.^{5,19,20} A targeted LSL sampling protocol isolating only LSL contact water would likely yield a higher percentage of results above the lead AL for systems with Pb(II) pipe scale chemistry, but the specific location of the peak lead levels will necessarily vary with premise plumbing configurations.

Seasonal Variability. In a site-by-site comparison, lead concentrations were higher in Sept/Oct than in Mar/Apr or June, with the starkest statistical difference between first-draw

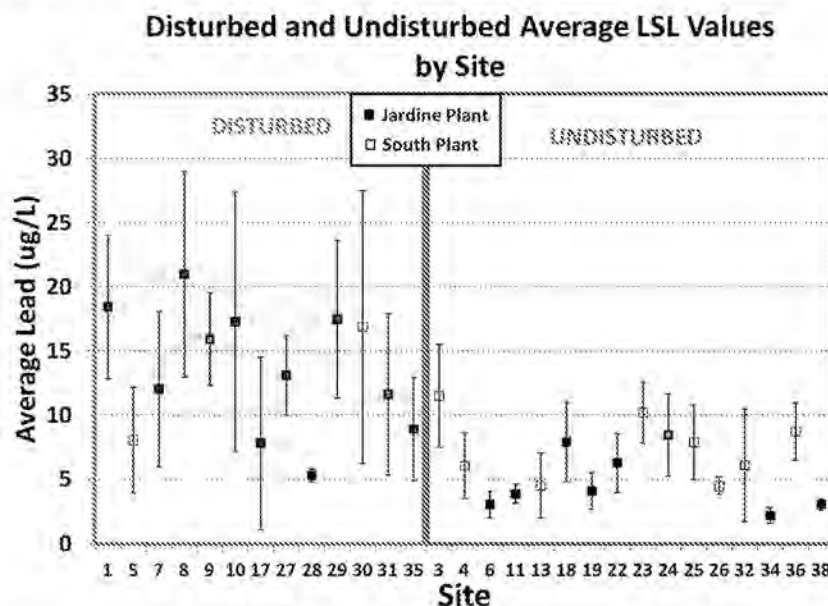


Figure 4. Average lead levels at disturbed and undisturbed sites. Error bars represent 1 standard deviation.

NHU samples collected in Mar/April and Sept/Oct ($p = 0.03$ for two-tailed paired Student's t -test). Overall, 68% and 69% of NHU and PF first-draw samples, respectively, were higher in Sept/Oct than in Mar/Apr, while 55% of paired sequential samples were higher in Sept/Oct than in June. Seasonal variation in lead levels consists of multiple contributing factors from the source water through the premise plumbing which could not be precisely isolated in this study, but the results in this study are consistent with other findings on seasonal variability (SI Table S6d).²¹ Factors include (1) water temperature, (2) water chemistry variation, and (3) fluctuations in water usage for Sept/Oct versus June, which could increase or decrease lead levels.^{22,23}

Lead Concentrations Vary Throughout Each Individual LSL and among Different LSLs Across the System. There was a high degree of variability in sequential sample results at most sites, some of which could include a particulate-bound component as reflected in spikes in some sequential sampling results (SI Figures S9–S40). For most sites, no individual sample result from within the LSL can characterize the lead concentrations at the site. Within the complete sampling profile results, lead levels at most sites ranged from well below to well above the AL (Figure 3). Under the LCR, this would mean that a system would meet the action level and have no additional regulatory requirements or would exceed the AL and be required to implement additional requirements, depending on which sample result is selected as the compliance sample. The variability within sites and between sites is similar in trend to that found in several other studies reporting sequential sampling conducted in water systems with different corrosion control strategies and chemistries from CDWM.^{1,4,10,12,14,15,24–27}

Additional compliance data from a second large utility (City B) which exceeded the lead AL and conducted sampling using the temperature change LSL sampling protocol in the LCR,³ yielded similar variability across the system (SI Figure S8 and Table S9). A total of 1975 LSL sites were sampled, with 1762 results (89%) below the lead AL; 128 results (6.5%) from 16 to 30 $\mu\text{g/L}$; 57 results (2.8%) from 31 to 50 $\mu\text{g/L}$; and 28 results (1.4%) between 51 and 580 $\mu\text{g/L}$. This LSL sampling protocol

is similarly vulnerable to low biases, although many results were considerably higher than the AL (SI Figure S8).

Factors Affecting Lead Levels. The majority of high lead results occurred at sites with a documented physical disturbance of the LSL between 2005 and 2011 (Figure 4). The actual extent to which the LSL was physically disturbed is unknown for all sites, and the records of disturbances are based on information provided by CDWM and by the sampling volunteers (SI Figures S9–S40).

For the purpose of this study a physical LSL disturbance is defined as a meter installation or replacement, autometer-reader (AMR) installation, service line leak repair, external service shut-off valve repair or replacement, or significant street excavation directly in front of the home that could disturb the LSL. An “undisturbed” site is an unmetered site where neither the CDWM nor resident have a record or recollection of any disturbance, as defined above. A third category, “indeterminate”, is used for three sites where CDWM has no record of any LSL disturbance, and the resident did not provide a response as to whether there has been any LSL disturbance. Cross-checking was important because information provided by volunteers in some cases contradicted CDWM records, and upon further investigation, the records were found to be incomplete and were corrected, which resulted in reclassification of the site.

Of the 13 disturbed sites, 11 sites had 3 or more sequential sampling results above the lead AL, two sites had 2 results each above the AL, and one site had no results above the AL. Of the 16 sites with no known disturbance, only three sites had any results above the lead AL. In the remaining 3 “indeterminate” sites, 30 of 81 sample results (37%) were above EPA's lead AL (Table 2).

A recent AWWA publication on the state of water infrastructure highlights the need for major infrastructure work.²⁸ This necessary infrastructure work will potentially increase the incidence of damage to the protective scales within LSLs as this work is performed. Inevitably, these physical LSL disturbances will continue to occur with increased frequency as part of daily routine water system maintenance and nonwater related community infrastructure work.

Table 2. Lead Results for Disturbed, Undisturbed, and Indeterminate Sites^a

disturbed sites			undisturbed sites			indeterminate sites		
no. sites	no. samples	no. above AL	no. sites	no. samples	no. above AL	no. sites	no. samples	no. above AL
13	327	117	16	372	6	3	81	30
% samples over AL: 36%			% samples over AL: 2%			% samples over AL: 37%		

^aMost lead results above the AL were found at sites with LSL disturbances. Additional results above the AL were also found at sites where the status of the LSL (disturbed or undisturbed) could not be confirmed. Sites without LSL disturbances had few if any results above the AL.

Possible Implications of Water Conservation and Use.

Information provided by CDWM and volunteers anecdotally suggests that low water usage may also play a role in high lead levels at some sites. Of the four locations with the highest average lead levels, three (Sites 1, 29, and 10) had documented low water usage. Site 1 had average monthly water usage of 3444 gallons (13 037 L) which does not appear to be low usage. However, information provided by the resident indicates that the majority of the monthly water usage occurs during a relatively small number of days during the month when there is a high volume of water usage. Site 29 had average monthly usage of 1826 gallons (6912 L), and Site 10 had an average usage of 1438 gallons/month (5443 L/month). For comparison, the mean single-family household water usage is approximately 8582 gallons/month (32 486 L/month), with a sizable standard deviation.²⁹

In two locations (Sites 17 and 5), lead levels decreased with an increase in water usage. As water usage approximately doubled at Sites 17 and 5, maximum lead levels from sequential sampling decreased from 25 to 5.5 $\mu\text{g/L}$ and from 17 to 12 $\mu\text{g/L}$, respectively. Although this represents a small set of samples, these observations support the idea that higher lead levels can be associated with low water usage.³⁰

Extrapolating from prior research suggests the necessity of consistent flow to deliver corrosion inhibitor effectively into passivating films,³¹ and correlates increased inhibitor dosages with reduced lead release.^{10,32–35} Low water usage may inhibit healing of the damaged scales, and influence the rate of galvanic corrosion. Water usage effects cannot be separated from other seasonal effects in this study, but prior literature and the combined sequential graphs showing entire profiles shifted up or down from the June to Sept/Oct sampling suggest further investigation is warranted (SI Figures S9–S40). As conservation efforts increase, it will become increasingly important to conduct further research on the relationship between water usage and increases in lead levels.

The results in this study also indicate that more appropriate flushing guidance must be developed, based on neighborhood and premise plumbing characteristics, and whether a home has a LSL or not. Much of the current published and web-based flushing guidance inadvertently increases the risk of exposure to elevated lead levels by clearing an insufficient amount of water volume.¹⁷ Even fully flushing LSLs may only lower lead levels to a limiting, measurable lead level, that relates to the plumbosolvency of the water, the flow rate, the length and internal diameter of the pipe,^{5–7,10,19,20} and possibly effects of prior disturbances (SI Table S7).

Risk Identification and Management. Recently, CDC issued a health alert associating higher elevated blood lead levels with partial LSL replacement,³⁶ and also concluded that LSLs were an independent risk factor for elevated blood lead levels even when lead levels in drinking water met the LCR lead AL of 0.015 mg/L.³⁷ As highlighted in this study, LSLs can contribute high lead when they are disturbed in many different ways, not just due to partial LSL replacement, and water usage may also play a role in the resultant high lead levels and potential increased human exposure. In an August 2012 update on lead in drinking water and blood lead levels, the CDC notes that “The recent recommendations from the CDC Advisory Committee on Childhood Lead Poisoning Prevention to reduce or eliminate lead sources for children before they are exposed underscore the need to reduce lead concentrations in drinking water as much as possible.”³⁸

As the ultimate human and environmental health goal, LSLs should be completely removed where possible. The stability of the protective scales within LSLs depends on many factors which can change over time. For example, changes to water quality or treatment have resulted in high lead levels over a sustained period of time (years).^{10,39–41} Under the current regulatory framework, elevated lead levels from disturbances, water quality, treatment, or water usage changes can potentially go undetected for up to 3 years between LCR compliance monitoring periods, which can result in increased public exposure over a significant period of time.

Proper selection of sampling sites, sampling protocol, and other site conditions is critical for evaluating the amount of lead corrosion and release that is occurring in the distribution system. Successful optimization of the plumbosolvency treatment depends on an accurate understanding of the corrosion mechanisms, pipe scale mineralogy and structure, and the consequences of LSL disturbances and water conservation efforts. No published studies could be found that systematically investigated the time and inhibitor doses/water quality adjustments necessary to overcome the disturbances and damage to the lead pipe scales that will be routinely occurring throughout cities across the U.S., as long as full or partial lead service lines remain in service.

Analyses of the Chicago LSL scales by EPA (to be reported elsewhere) reveal that the surface coatings on both lead service line and galvanized interior pipes from CDWM are primarily composed of amorphous aluminum, calcium, and phosphorus-rich deposits, and not crystalline lead(II) (or zinc)-orthophosphate phases that are predicted by conventional divalent lead plumbosolvency theory for orthophosphate dosing.^{10,33,42} An understanding of the scales is essential to study and implement procedures and strategies for effective and timely repair of the protective scales damaged by LSL disturbances, and to minimize the public's exposure to high lead levels that can result from damaging the scales. Experimental evaluations are critical when scale compositions fall outside the scope of well-understood predictive corrosion control practices.

■ ASSOCIATED CONTENT

Supporting Information

Additional background information, tabular summaries of sampling results, and graphics. This material is available free of charge via the Internet at <http://pubs.acs.org>.

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Notes

The authors declare no competing financial interest.

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From: Sygo, Jim (DEQ)
Sent: Tuesday, October 20, 2015 5:12 PM
To: chester@millercanfield.com
Subject: FW: Flint Water Elected leader meeting ODWMA Final Draft documents
Attachments: Flint-QuadrantDiagram-Draft.xlsx; City of Flint Background-Draft.docx; FAQ-Flint Customer Tap water lead levels-draft.docx

This was discussed with him. I'm setting a meeting up with his attorney and will provide him with 2 construction permits that were issued at the time but had nothing to do with moving over to Flint Water

From: Busch, Stephen (DEQ)
Sent: Thursday, September 17, 2015 3:08 PM
To: Wurfel, Brad (DEQ); Pallone, Maggie (DEQ)
Cc: Thelen, Mary Beth (DEQ); Feuerstein, Heather (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Sygo, Jim (DEQ)
Subject: Flint Water Elected leader meeting ODWMA Final Draft documents

Brad and Maggie,

Attached are my final edits to the documents you requested. Let me know if you have questions or need anything else.

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

	A	B
1	DRAFT	
2	DRINKING WATER - LEAD - DISTRIBUTION OF RESPONSIBILITIES	
3		
4	Environmental Protection Agency	Michigan Department of Environmental Quality
5		
6	Promulgation of Federal Safe Drinking Water Act Rules	Primacy - Michigan Safe Drinking Water Act and Administrative Rules
7	1974 Safe Drinking Water Act	Oversight of public water systems
8	1991 Lead and Copper Rule	Inspections
9	2000 Lead and Copper Rule Minor Revisions	Construction Permitting
10	2007 Lead and Copper Rule Short Term Revisions	Provide loans to water systems for public infrastructure improvements
11	???? Lead and Copper Rule Long Term Revisions	State Laboratory Services
12	Granting Primacy of Federal Regulations to States	Laboratory Certification
13	Auditing of State Public Water Supply Programs	Establish monitoring requirements, quantity and frequency
14	Provide Funding to States	Verification of monitoring results and compliance determination
15		Notify water systems of Action Level Exceedance
16		Establish Water Quality Parameter Ranges, as necessary
17		State Reporting to EPA
18		Operator Training and Certification
19		
20	City of Flint Water System	Water Customers
21		
22	Certified Operation of public water system	Participate in lead sampling as requested
23	Establish Water Rates	Request lead testing if concerned
24	Obtain construction permits	Follow lead sampling Instructions
25	Reporting to MDEQ	Provide signed information on how sample was collected
26	Coordination of lead and copper sampling	Review individual result material
27	Establishing a Tiered Sampling Pool	Follow instructions for reducing lead exposure
28	Providing Sampling Kits and Instructions to customers	Replace private leaded service line and plumbing materials with lead-free products
29	Obtain signed statements from participating customers	Obtain plumbing permits and comply with code requirements
30	Obtain sample analysis	Pay Water Bills
31	Provide individual lead sample result to participants	Read Annual Report (CCR)
32	Comply with Action Levels for lead and copper	Read and follow Public Notification materials
33	Provide lead monitoring and notice Certification to MDEQ	
34	Provide Annual Report (CCR) to all customers	
35	Conduct Water Quality Parameter Monitoring	
36	Recommend and Install Optimized Corrosion Control Treatment	
37	Provide Public Notification, as necessary	
38	Replace public portion of lead service, as necessary	

DRAFT 9/17/2015

City of Flint Water System Background

Water Service Land Area 34 square miles
 550+ miles of public water mains
 250+ miles of water mains 75+ years old
 70% of public water mains are unlined cast iron pipe
 Service population 99,763
 Service connections 32,900
 Flint Water System established in 1883
 Flint Water Treatment Plant #2 completed in 1954
 Connection to Detroit Water and Sewerage Department 1967
 Flint Water Treatment Plant #2 rehabilitated 1999 – 2005

City of Flint Timeline

April 2013 – Flint notifies DWSD of contract discontinuation and joins the Karegnondi Water Authority
 April 2013 – DWSD sets termination of Flint water service contract to April 17, 2014
 June 2013 – Karegnondi Water Authority groundbreaking
 June 2013 – Flint notifies DEQ of intent to use of Flint Water Treatment Plant full time with Flint River
 May 2014 – Flint stops purchasing DWSD water. Starts using the City of Flint WTP and Flint River
 August 2014 – Flint E.Coli Bacteria violation, Partial System Boil Water Advisory
 August 2014 – Disinfection Byproducts, DEQ requests preemptive Operational Evaluation
 September 2014 – Flint Total Coliform Bacteria violation, Partial System Boil Water Advisory
 November 2014 – Disinfection Byproducts violation begins
 January 2015 – 1st 6 month lead and copper sampling completed 100 samples, 90th% = 6 ppb
 July 2015 – 2nd 6 month lead and copper sampling completed 69 samples, 90th% = 11 ppb
 August 2015 – Disinfection Byproducts return to compliance
 August 2015 – Flint required by DEQ to recommend and install Optimized Corrosion Control Treatment

 January 2016 – Flint plans to have Optimized Corrosion Control Treatment operational
 July 2016 – Planned connection to Karegnondi Water Authority (Lake Huron water to Flint WTP)

Frequently Asked Questions about Customer Tap water lead levels in the City of Flint – DRAFT 9/17

How was the Lead and Copper Rule Established?

Under the Safe Drinking Water Act, EPA sets public health goals and enforceable standards for drinking water quality. The Lead and Copper Rule was established as a treatment technique rule because lead contamination of drinking water often results from corrosion of the plumbing materials belonging to water system customers, and there is no safe level of lead exposure. Therefore, instead of meeting a maximum contaminant level (MCL) for lead or copper, the rule requires public water supplies to take certain actions to minimize lead and copper in drinking water, to reduce water corrosivity and prevent the leaching of these metals from the premise plumbing. When that isn't sufficient, replacement of lead service lines under their control could be required. The current rule sets a monitoring action level (AL) which is not the same as an MCL. An MCL is based on health effects and feasibility; whereas an AL is a screening tool for determining when certain treatment technique actions are necessary.

What is the source of lead in customer tap water?

Lead enters or leaches into water from lead service lines, lead solder, and leaded plumbing materials including fixtures, faucets, and fittings. Sampling at the Flint Water Treatment Plant has shown no lead in its treated water.

How is lead compliance determined?

Compliance with the Action Level (AL) is based on a 90th percentile level calculation. For example, if 100 compliance samples were collected, the 90th percentile would be based on the result of the 11th highest lead sample for that monitoring period. Therefore, if more than ten percent of these compliance samples report lead above the AL of 15 parts per billion, a water supply has an AL exceedance. An exceedance is not a violation. It triggers other requirements which could include public notification, additional water quality sampling, and possibly further treatment.

What is the frequency of lead and copper sampling?

Sampling periods can be as frequent as every six months to as little as once every three years. Reduction in sampling frequency is based on continued compliance with the Action Level and normally follows a progression of two six month periods, followed by annual sampling for three additional years, then one period every three years. Compliance samples can be collected at any time during six month sampling periods. When sampling is conducted annually or once every three years, all compliance samples are required to be collected between June 1 and September 30. This is done to capture warmest water conditions likely to produce the most leaching.

Why are customers asked to collect lead and copper samples?

Compliance sampling for lead requires the water to, "have stood motionless in the plumbing system of each sampling site for not less than six hours." In order to achieve this requirement, residents are provided with detailed instructions and requested in general to collect the sample as the first thing they do when they wake up in the morning. It would be difficult for City water staff to otherwise collect such samples within the limits of the monitoring period.

How long has the City of Flint conducted lead monitoring?

The City of Flint first began compliance monitoring for lead levels in customer taps as part of the Detroit Water and Sewerage Department (DWSD) consecutive system in January 1992 following the enactment of the Lead and Copper Rule. Two six month periods were collected in 1992. Sampling resumed with two six month periods in 1997 following the installation of Optimized Corrosion Control Treatment by DWSD. A six month period was collected in 1998 and again in 1999. Annual sampling was completed in 2000, 2001, and 2002. Then triennial sampling was completed in 2005, 2008, and 2011 before the City of Flint changed sources and treatment in May 2014.

Has the City's compliance monitoring ever exceeded the lead action level?

No. While some individual samples do exceed the 15 part per billion (ppb) lead Action Level (AL), the AL is not a standard. Compliance is determined based on the 90th percentile value of all valid compliance sample results obtained during the established monitoring period. The City of Flint 90th percentile level has ranged between 0 ppb (2008 and 2011) and 15 ppb (1992), but never exceeded the AL. This includes the two most recent six month periods in 2014 and 2015 of 6 ppb and 11 ppb, respectively.

Why are some samples not included in the compliance determination?

Lead and Copper compliance sample sites must meet specific criteria that target customers with the highest potential for lead leaching. The sample must also be collected from a commonly used kitchen or bathroom tap, and in accordance with the provided sampling instructions. Customers that employ certain types of additional treatment are not allowed as such samples are not representative of water quality supplied by the water system. Samples must also be collected within the established monitoring period.

What is the timeline for installation of corrosion control treatment?

Under the Lead and Copper Rule treatment technique requirements, steps to complete the installation of optimal corrosion control treatment and follow-up monitoring are allowed to take up to five years. The City of Flint has committed to completing installation of optimal corrosion control treatment in less than six months.

What will happen when Flint obtains water from the Karegnondi Water Authority?

The City has committed to having Optimized Corrosion Control Treatment in place prior to its connection with the Karegnondi Water Authority (KWA). The water provided by KWA will come from a new source, Lake Huron. This change in source will require the City to return to two six month periods of lead and copper sampling and continued compliance with the Action Levels. The City of Flint water treatment plant will continue to operate with uninterrupted Optimized Corrosion Control Treatment.

When is customer and public notification regarding lead required?

Under the Lead and Copper Rule, public water supplies are required to provide individual lead results to those customers whose homes are sampled for compliance with the action level. Each of these customers is also provided information on actions they can take to limit lead exposure in their tap water. Furthermore, results from the most recent lead compliance monitoring determination are included each year in the annual consumer confidence report (CCR), also known as the annual water quality report that each water system must provide to all customers. As required by EPA, this report also includes general consumer awareness information regarding lead.

How can I reduce lead in drinking water in homes with materials containing lead?

Flush your pipes before drinking, and only use cold water for consumption. The more time water has been sitting in your home's pipes, the more lead it may contain. When water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until it becomes as cold as it will get. This could take as little as five to thirty seconds if there has been recent water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer. Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels of lead. The two actions recommended above are very important to the health of your family. They should be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

How long would it take to replace lead service lines across Flint?

The City has approximately 32,900 service connections in total. Over 15,000 of these connections are considered lead service lines. Even if many crews were contracted it could take up to 15 years to complete this work.

What will it cost to have lead service lines replaced?

Average costs have ranged from \$2,000 - \$8,000. Cost will vary depending on the length and size of service line that is needed, as well as the ground cover and soil conditions encountered.

With over 15,000 lead service lines at an estimated cost of \$4,000 for each replacement, a total cost could be \$60 million or more.

Who is responsible for replacement of lead materials?

Replacement of service pipes on private property and any lead plumbing materials within the building structure is the homeowner/property owner's responsibility. The City of Flint owns the service pipe from the water main to the curb stop valve. This valve is normally located two feet in from the street curb.

Why doesn't the City at least replace their portion of lead service lines?

Partial lead service line replacement has been shown to exacerbate lead exposure, increasing the potential for harm, rather than reducing lead exposure. Only full lead service line replacement has been demonstrated effective in achieving long-term reductions in drinking water lead levels.

How does blood lead level monitoring relate to customer tap water monitoring?

Monitoring of blood lead levels takes into account all sources of lead exposure, not just exposure through drinking water. Water customers who have elevated levels of lead in their tap water, or who have a lead service line or plumbing materials containing lead are encouraged to be screened for blood lead level monitoring through their local county health department.

Blood lead level monitoring is overseen statewide by the Michigan Department of Health and Human Services. Their review of blood lead level testing results for the 12 month period just after the City of Flint changed its water source (May 2014 – April 2015) showed no significant change in the pattern of blood lead levels in comparison with levels reported for the previous three years. This data suggests the recent changes in source and treatment by the City of Flint water system have not increased lead exposure.

From: Sygo, Jim (DEQ)
Sent: Wednesday, October 21, 2015 12:57 PM
To: Busch, Stephen (DEQ);Prysby, Mike (DEQ)
Subject: FW: Flint Task Force comments -- MDEQ Draft Sampling Document
Attachments: EPA Comments on MDEQ Draft Sampling 10-21-15 (FTF 15-1).pdf

FYI

From: Kaplan, Robert [<mailto:kaplan.robert@epa.gov>]
Sent: Wednesday, October 21, 2015 12:47 PM
To: Sygo, Jim (DEQ)
Subject: Flint Task Force comments -- MDEQ Draft Sampling Document

Hello Jim,

As we discussed, attached please find the EPA Flint Task Force comments on the MDEQ Draft Sampling Document.

- Bob

Flint Safe Drinking Water Task Force (FTF 15-1)

Flint Safe Drinking Water Task Force Comments on MDEQ Draft Protocol for Collecting Water Samples at Schools for Lead Analysis

EPA received the latest draft of MDEQ's "Protocol for Collecting Water Samples at Schools for Lead Analysis" for comment from Liane Shekter-Smith on October 19, 2015. Below are comments from EPA's Flint Safe Drinking Water Task Force.

General

There is an understandable urgency to assess the situation in schools, but an equally important consideration should be the ability to assess whether progress is being made over time as treatment is introduced and monitored. It is critically important that everyone understand how to collect samples from the different types of outlets, how to interpret the sample results (i.e., what the results mean and what they don't mean) and how to effectively communicate the results to the public.

Additionally, there is always confusion over what threshold lead levels should be used and what the numerical sampling results mean. It is very important that everyone involved in the sampling and communication have proper training so that accurate information is provided to the public from the beginning. EPA's recommendation is that training be provided by ORD as soon as possible to the health department and others that are involved before the school sampling begins. It would also be good to provide the same entities an overview on corrosion and corrosion control so that the objectives of the sampling and capabilities/limitations of the treatment are properly understood by all.

Sampling protocol

The proposed end-point sampling is useful and can provide information on whether end-point devices should be replaced. Relying solely on the proposed sampling to evaluate the safety of the water in the plumbing overall is not possible. It is essential to have proper baseline data from throughout the school plumbing, not just the endpoints, to assess the risk as well as the progress of treatment. The best sampling protocol for that would be sequential sampling conducted at 2 or 3 locations in each school. The sequential sampling results would enable an ongoing assessment of the effectiveness of treatment throughout the plumbing network over time. This type of an assessment is not possible to do with single samples. Certainty is very important at this stage.

Timing of Sample Collection

If the purpose of the sampling is to identify the sources of lead in the plumbing system and also to identify potential exposure, the timing of the sample collection is important. Do the schools have a program to flush all drinking water consumption taps and coolers and bubblers on the first day back in school after weekends, vacations, etc.? If they do not, the sampling will miss the worst potential exposure for the first few kids drinking the water.

The proposed timing in the protocol indicates that samples should not be collected followed an extended stagnation, such as a weekend. This limitation is more appropriate for samples collected from residences as this does not reflect normal household use. MDEQ should consider collecting samples on different days of the week to get an idea of the conditions throughout the

Flint Safe Drinking Water Task Force (FTF 15-1)

week. Samples from one or some of the locations taken on Monday mornings would represent the ‘worst-case’ lead levels found under normal conditions that the children would be exposed to as the water routinely stagnates in the plumbing each weekend that school is in session. Collecting samples during this time would provide more consistent ‘worst-case’ data under normal usage for evaluating the effectiveness of remedial efforts. Samples could then be taken on a Wednesday and on a Friday under different water use conditions.

On-Site Assessment

The protocol should state that the assessment should record any model number of faucets, valves, etc. that are accessible to inspection, with digital photos included, if possible. Some might be behind walls, but others may be just under sinks, bubblers, etc. This is important in identifying and interpreting the 125 mL samples. If potential brass devices are seen that would not be captured in the 125 mL sample, they should be noted, or an option added to include a 2nd sequential sample for the first draw, if appropriate.

The On-site Assessment should also identify if there is any water treatment being done in the building, i.e., POU or POE.

The second bullet under Step 1 asks about buildings built after 1986 and whether lead-free plumbing and solder was used. Keep in mind that the definition of lead-free was revised in 1996 and again in 2011. Most, if not all, 1986 brass/bronze plumbing fittings and fixtures would fail to meet the current lead-free requirements.

Under Step 5 – Prior to Sample Collection, there is a recommendation to flush the taps the afternoon prior to sampling because drinking water has not been consumed from them for several weeks. This seems to be equated with no use, which may apply to the water coolers and bubblers if shut off, but may not apply to kitchen taps (dish/pot cleaning) and bathroom taps (hand washing). Also, the instruction to school personnel should specify how many minutes to run the tap the day before sampling rather than “several minutes”.

Sampling Volumes

Two sequential small volume samples at the beginning is preferable, just to have a better idea of the detail of multiple sources of lead in the proximity of the outlet. It sometimes would save a trip back to collect more samples if there is a high hit in the one sample. If you do the 125 mL only, the identification of plumbing fittings and fixtures in the On-site Assessment will help identify potential sources of lead in the case of a high hit.

From: Sygo, Jim (DEQ)
Sent: Thursday, October 22, 2015 4:47 PM
To: McDonald, Paul (DEQ)
Subject: Fwd: Wire Transfer Information
Attachments: 3703 - New Template.pdf; ATT00001.htm

Go ahead with the wire transfer on Friday.

Sent from my iPhone

Begin forwarded message:

From: "Christenson, Elysse (TREASURY)" <ChristensonE1@michigan.gov>
To: "Fielek, Joseph L. (Treasury)" <FIELEKJ@michigan.gov>, "Workman, Wayne (TREASURY)" <WorkmanW@michigan.gov>, "Byrne, Randall (Treasury)" <ByrneR1@michigan.gov>
Cc: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, "Saxton, Thomas (Treasury)" <SaxtonT@michigan.gov>, "Gross, Sara (Treasury)" <GrossS1@michigan.gov>, "Lindsay, Brenda (Treasury)" <LindsayB2@michigan.gov>
Subject: RE: Wire Transfer Information

To initiate the wire request, please complete the attached form and fax it to Treasury's Office of Financial Services at (517) 636-5401. Being that this is a non-repetitive wire, we will need to obtain Joe Fielek or Tom Saxton's approval prior to processing. In addition to the form, please provide us with a brief memo explaining the reason for the wire.

Staff is available to process wires until 4:30 each day; however, being that we will need to obtain approvals on our end, we encourage you to fax the requested memo and form to us by 1:30.

Feel free to contact me if you have further questions or would like assistance in completing the form.

Thanks,

Elysse Christenson, Departmental Analyst
 Banking and Disbursements Section
 Office of Financial Services
 Michigan Department of Treasury
 Ph: 517.636.5384
ChristensonE1@michigan.gov

From: Fielek, Joseph L. (Treasury)
Sent: Thursday, October 22, 2015 4:00 PM
To: Workman, Wayne (TREASURY) <WorkmanW@michigan.gov>; Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>; Gross, Sara (Treasury) <GrossS1@michigan.gov>; Christenson, Elysse (TREASURY) <ChristensonE1@michigan.gov>; Lindsay, Brenda (Treasury) <LindsayB2@michigan.gov>
Subject: RE: Wire Transfer Information

Yes Jim have you DEQ accounting people work with our banking people regarding initiating a wire request.

From: Workman, Wayne (TREASURY)
Sent: Thursday, October 22, 2015 3:57 PM
To: Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Fielek, Joseph L. (Treasury) <FIELEKJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>
Subject: Re: Wire Transfer Information

DEQ starts the ball

Sent from my iPhone

On Oct 22, 2015, at 3:55 PM, Byrne, Randall (Treasury) <ByrneR1@michigan.gov> wrote:

Jim:

I have been asked by Wayne Workman to forward this to you. This is the documentation from Flint regarding their payment to DWSD of the \$10M deposit. I understand that you will forward to Joe Fielek to complete the reimbursement transaction.

Thanks,
 Randy

From: Natasha Henderson [<mailto:nhenderson@cityofflint.com>]
Sent: Thursday, October 22, 2015 3:23 PM
To: Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Subject: Fwd: Wire Transfer Information

Hello Randy,

You were included in this email.

Thanks,

Natasha L. Henderson, City Administrator
City of Flint, Michigan
 1101 S. Saginaw St.
 Flint, MI 48502
 Email: nhenderson@cityofflint.com
 Phone: (810) 237-2057
www.cityofflint.com

----- Forwarded message -----

From: Jody Lundquist <jlundquist@cityofflint.com>
Date: Thu, Oct 22, 2015 at 2:27 PM
Subject: Wire Transfer Information
To: saxtont@michigan.gov, "Sygo, Jim (DEQ)" <sygoj@michigan.gov>, byrnerl@michigan.gov

Cc: Natasha Henderson <nhenderson@cityofflint.com>

Good afternoon, Gentlemen.

Please find the City's wire transfer information below.

Bank Name: JPMorgan Chase
Routing #: **PPI**
Acct#: **PPI**
Account Name: Commercial Account
Contact: Amanda Trujillo

A copy of the outgoing wire transfer confirmations totaling \$10 million is attached. The first wire was sent to DWSD on Friday, October 16, in the amount of \$2 million. The remaining balance of \$8 million was sent on Monday, October 19, in two separate transactions of \$3 and \$5 million due to max transfer limitations.

Please let me know if you have any questions or if I may be of any further assistance.

Best regards,

Jody N. Lundquist
Chief Financial Officer
City of Flint
1101 S. Saginaw Street, 2nd Floor
Flint, MI 48502
jlundquist@cityofflint.com
(810) 766-7268 ext. 2301

<JP Morgan Wire Transfer Confirmation DWSD.PDF>

From: Sygo, Jim (DEQ)
Sent: Thursday, October 22, 2015 4:50 PM
To: Fielek, Joseph L. (Treasury)
Subject: Re: Wire Transfer Information

Will do Joe. Paul McDonald will be on this tomorrow.

Sent from my iPhone

On Oct 22, 2015, at 4:00 PM, Fielek, Joseph L. (Treasury) <FIELEKJ@michigan.gov> wrote:

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Subject: Re: Wire Transfer Information

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City of Flint, Michigan

1101 S. Saginaw St.

Flint, MI 48502

Email: nhenderson@cityofflint.com

Phone: (810) 237-2057

www.cityofflint.com

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From: **Jody Lundquist** <jlundquist@cityofflint.com>

Date: Thu, Oct 22, 2015 at 2:27 PM

Subject: Wire Transfer Information

To: saxtont@michigan.gov, "Sygo, Jim (DEQ)" <svgoj@michigan.gov>, byrnerl@michigan.govCc: Natasha Henderson <nhenderson@cityofflint.com>

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Chief Financial Officer

City of Flint

1101 S. Saginaw Street, 2nd Floor

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jlundquist@cityofflint.com

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Elysse Christenson, Departmental Analyst
 Banking and Disbursements Section
 Office of Financial Services
 Michigan Department of Treasury
 Ph: 517.636.5384
Christensone1@michigan.gov

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Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>; Gross, Sara (Treasury) <GrossS1@michigan.gov>; Christenson, Elysse (TREASURY)

<ChristensonE1@michigan.gov>; Lindsay, Brenda (Treasury) <LindsayB2@michigan.gov>

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Sent: Thursday, October 22, 2015 3:57 PM

To: Byrne, Randall (Treasury) <ByrneR1@michigan.gov>

Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Fielek, Joseph L. (Treasury) <FIELEKJ@michigan.gov>;

Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>

Subject: Re: Wire Transfer Information

DEQ starts the ball

Sent from my iPhone

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Please find the City's wire transfer information below.

Bank Name: JPMorgan Chase
Routing #: **PPI**
Acct#: **PPI**
Account Name: Commercial Account
Contact: Amanda Trujillo

A copy of the outgoing wire transfer confirmations totaling \$10 million is attached. The first wire was sent to DWSD on Friday, October 16, in the amount of \$2 million. The remaining balance of \$8 million was sent on Monday, October 19, in two separate transactions of \$3 and \$5 million due to max transfer limitations.

Please let me know if you have any questions or if I may be of any further assistance.

Best regards,

Jody N. Lundquist
Chief Financial Officer
City of Flint
1101 S. Saginaw Street, 2nd Floor
Flint, MI 48502
jlundquist@cityofflint.com
(810) 766-7268 ext. 2301

<JP Morgan Wire Transfer Confirmation DWSD.PDF>

From: Sygo, Jim (DEQ)
Sent: Friday, October 23, 2015 2:23 PM
To: McDonald, Paul (DEQ)
Subject: Re: Wire Transfer Information

Thanks

Sent from my iPhone

On Oct 23, 2015, at 1:20 PM, McDonald, Paul (DEQ) <mcdonaldp@michigan.gov> wrote:

I have a saved voicemail from the Chief Accountant at Treasury (that was my Suzie Nichols conversation) assuring me that won't happen.

From: Sygo, Jim (DEQ)
Sent: Friday, October 23, 2015 12:48 PM
To: McDonald, Paul (DEQ) <mcdonaldp@michigan.gov>
Subject: FW: Wire Transfer Information

Make sure we don't pay it twice

From: Christenson, Elysse (TREASURY)
Sent: Friday, October 23, 2015 12:44 PM
To: Fielek, Joseph L. (Treasury); Workman, Wayne (TREASURY); Byrne, Randall (Treasury)
Cc: Sygo, Jim (DEQ); Saxton, Thomas (Treasury); Gross, Sara (Treasury); Lindsay, Brenda (Treasury)
Subject: RE: Wire Transfer Information

Hi all,

We've received the Flint wire request from Jennifer Dingman for \$4,000,000. I've forwarded to Joe for his approval. Once we receive his approval, we'll process the request and send fax confirmation to Jennifer Dingman. The payment will be processed today.

Feel free to contact me with questions.

Thanks,

Elysse Christenson, Departmental Analyst
Banking and Disbursements Section
Office of Financial Services
Michigan Department of Treasury
Ph: 517.636.5384
Christensone1@michigan.gov

From: Fielek, Joseph L. (Treasury)
Sent: Thursday, October 22, 2015 5:07 PM
To: Christenson, Elyse (TREASURY) <ChristensonE1@michigan.gov>; Workman, Wayne (TREASURY) <WorkmanW@michigan.gov>; Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>; Gross, Sara (Treasury) <GrossS1@michigan.gov>; Lindsay, Brenda (Treasury) <LindsayB2@michigan.gov>
Subject: RE: Wire Transfer Information

Thanks for sending this Elyse.

From: Christenson, Elyse (TREASURY)
Sent: Thursday, October 22, 2015 4:11 PM
To: Fielek, Joseph L. (Treasury) <FIELEKJ@michigan.gov>; Workman, Wayne (TREASURY) <WorkmanW@michigan.gov>; Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>; Gross, Sara (Treasury) <GrossS1@michigan.gov>; Lindsay, Brenda (Treasury) <LindsayB2@michigan.gov>
Subject: RE: Wire Transfer Information

To initiate the wire request, please complete the attached form and fax it to Treasury's Office of Financial Services at (517) 636-5401. Being that this is a non-repetitive wire, we will need to obtain Joe Fielek or Tom Saxton's approval prior to processing. In addition to the form, please provide us with a brief memo explaining the reason for the wire.

Staff is available to process wires until 4:30 each day; however, being that we will need to obtain approvals on our end, we encourage you to fax the requested memo and form to us by 1:30.

Feel free to contact me if you have further questions or would like assistance in completing the form.

Thanks,

Elyse Christenson, Departmental Analyst
 Banking and Disbursements Section
 Office of Financial Services
 Michigan Department of Treasury
 Ph: 517.636.5384
Christensone1@michigan.gov

From: Fielek, Joseph L. (Treasury)
Sent: Thursday, October 22, 2015 4:00 PM
To: Workman, Wayne (TREASURY) <WorkmanW@michigan.gov>; Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>; Gross, Sara (Treasury) <GrossS1@michigan.gov>; Christenson, Elyse (TREASURY) <ChristensonE1@michigan.gov>; Lindsay, Brenda (Treasury) <LindsayB2@michigan.gov>
Subject: RE: Wire Transfer Information

Yes Jim have you DEQ accounting people work with our banking people regarding initiating a wire request.

From: Workman, Wayne (TREASURY)
Sent: Thursday, October 22, 2015 3:57 PM
To: Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Cc: Sygo, Jim (DEQ) <SygoJ@michigan.gov>; Fielek, Joseph L. (Treasury) <FIELEKJ@michigan.gov>; Saxton, Thomas (Treasury) <SaxtonT@michigan.gov>
Subject: Re: Wire Transfer Information

DEQ starts the ball

Sent from my iPhone

On Oct 22, 2015, at 3:55 PM, Byrne, Randall (Treasury) <ByrneR1@michigan.gov> wrote:

Jim:

I have been asked by Wayne Workman to forward this to you. This is the documentation from Flint regarding their payment to DWSD of the \$10M deposit. I understand that you will forward to Joe Fielek to complete the reimbursement transaction.

Thanks,
 Randy

From: Natasha Henderson [<mailto:nhenderson@cityofflint.com>]
Sent: Thursday, October 22, 2015 3:23 PM
To: Byrne, Randall (Treasury) <ByrneR1@michigan.gov>
Subject: Fwd: Wire Transfer Information

Hello Randy,

You were included in this email.

Thanks,

Natasha L. Henderson, City Administrator
City of Flint, Michigan
 1101 S. Saginaw St.
 Flint, MI 48502
 Email: nhenderson@cityofflint.com
 Phone: (810) 237-2057
www.cityofflint.com

----- Forwarded message -----

From: Jody Lundquist <jlundquist@cityofflint.com>
Date: Thu, Oct 22, 2015 at 2:27 PM
Subject: Wire Transfer Information
To: saxtont@michigan.gov, "Sygo, Jim (DEQ)" <sygoj@michigan.gov>, byrner1@michigan.gov
Cc: Natasha Henderson <nhenderson@cityofflint.com>

Good afternoon, Gentlemen.

Please find the City's wire transfer information below.

Bank Name: JPMorgan Chase

Routing #: **PPI**

Acct#: **PPI**

Account Name: Commercial Account

Contact: Amanda Trujillo

A copy of the outgoing wire transfer confirmations totaling \$10 million is attached. The first wire was sent to DWSD on Friday, October 16, in the amount of \$2 million. The remaining balance of \$8 million was sent on Monday, October 19, in two separate transactions of \$3 and \$5 million due to max transfer limitations.

Please let me know if you have any questions or if I may be of any further assistance.

Best regards,

Jody N. Lundquist

Chief Financial Officer

City of Flint

1101 S. Saginaw Street, 2nd Floor

Flint, MI 48502

jlundquist@cityofflint.com

(810) 766-7268 ext. 2301

<JP Morgan Wire Transfer Confirmation DWSD.PDF>

From: Sygo, Jim (DEQ)
Sent: Saturday, October 24, 2015 2:59 PM
To: Kaplan, Robert
Subject: Re: One further comment

DEQ and HSH will be ramping up educational information.

What EPA report is being referred to?

This should be discussed with the City Administrator. DEQ does not own the

The distribution lines and would not be digging them up to assess what appears to be a research project. Will discuss further with our team to see how this might be addressed.

Talk to you later this week.

Sent from my iPhone

On Oct 24, 2015, at 8:58 AM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:

Jim, I'm sorry that we have a straggler. This morning I received one last comment. I ordinary would say "too late" but this comment reflects deep knowledge of the Flint system (esp. the residence at issue). Pls let me know if there are any issues. Again, sorry for the late and unconsolidated comment.

Bob

1) Has anyone evaluated where the water quality parameter monitoring is being conducted by Flint? If not, we might want to do that to make sure that the sites selected are representative of the water quality throughout the city. My concern is that the chlorine residual range reported by the City in their October 2015 water quality report is given as 0.2 – 4.0(<https://www.cityofflint.com/public-works/utilitieswater/water-treatment-plant/>). However, we know that in at least one area of the city, even after flushing the tap for 8 hours, there was no detectable chlorine residual. Repeated tests over 18 days (last one was September 3) show the same. These measurements were done after the replacement of the old service line, so the chlorine is not getting to this area (<http://flintwaterstudy.org/information-for-flint-residents/chlorine-monitoring-in-flint-resident-ms-leeanne-walters-home/>)

2) The recommendations in the final report on the sampling we did in Flint are linked to the corrosion control treatment. The lead concentrations in the scale/sediment are orders of magnitude higher than what we typically see in drinking water samples, so I think from a risk perspective, we need to better understand the composition and stability of the scales within the pipes to to assess the stability of the scales and inform the treatment. Although the release of scale/sediment is not unique to Flint, the dislodging of scale/sediment would pose the greatest risk to residents by far. Our final report will be posted in the near future so should we include the assessment sampling in our comments on corrosion control (see below)?

Recommendations

As indicated by the results from the Walters' 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 leaded 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 Walters' 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.

Sent from my iPhone

From: Sygo, Jim (DEQ)
Sent: Thursday, October 29, 2015 12:27 PM
To: Anderson, Madhu (DEQ)
Subject: FW: Letter Regarding ODWMA Audit
Attachments: 10.20.2015-Letter-Ananich-AG-Ringler-FINAL.PDF

This is the letter sent by Ananich to the Auditor General. They will be evaluating this through access to our e-mails.

From: The Office of Senator Ananich [<mailto:SenJAnanich@senate.michigan.gov>]
Sent: Tuesday, October 20, 2015 12:38 PM
To: Miller, Kelly C. (OAG); Ringler, Doug (OAG)
Cc: Jordan.Dickinson@mail.house.gov; mayor@cityofflnt.com; HCroft@cityofflnt.com; hedman.susan@epa.gov; pov.thomas@epa.gov; Schock.michael@epa.gov; Lytle.darren@epa.gov; fortin.denise@epa.gov; Cook, Pat (DEQ); Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Edwardsm@vt.edu; Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: Letter Regarding ODWMA Audit

Auditor General Ringler,

Please see the attached letter regarding an audit of the Office of Drinking Water and Municipal Assistance (ODWMA).

Please do not hesitate to contact my office if you have any questions. Thank you for your time and attention.

Sincerely,

The Office of State Senator Jim Ananich
Senate Minority Leader
District 27

SENATE MINORITY LEADER
JIM ANANICH

☎ 517.373.0142
✉ senjananich@senate.michigan.gov
🌐 senatedems.com/ananich

October 20, 2015

Doug Ringler, CPA, CIA
Auditor General
201 North Washington Square, 6th Floor
Lansing, MI 48913

Auditor General Ringler,

It has come to my attention that the Office of the Auditor General is conducting an audit of the Office of Drinking Water and Municipal Assistance (ODWMA). This audit will assess the sufficiency of ODWMA's oversight of the State's drinking water and environmental health programs. As you may know, recently independent research by physicians and water quality experts verified that the City of Flint's drinking water contains hazardous levels of lead. This lead contamination is dangerous for all Flint's residents, but it is especially dangerous for the young children who live there.

I'm hoping the audit of ODWMA will answer the following questions:

- How does ODWMA ensure the data they receive is accurate?
- What accountability measures are in place for ODWMA staff who fail to follow data verification protocols?
- What accountability measures are in place for ODWMA staff who lie or misrepresent information to the Environmental Protection Agency?
- What policies do ODWMA and the Michigan Department of Environmental Quality (MDEQ) have in place to escalate major infractions up the chain of command?

Please ensure that these questions are answered by this audit so I can determine what legislative steps may be necessary to strengthen transparency and accountability within ODWMA.

Thank you for your consideration of this matter.

Sincerely,



Jim Ananich
Senate Democratic Leader
District 27

SENATE MINORITY LEADER
JIM ANANICH

☎ 517.373.0142
✉ senjananich@senate.michigan.gov
🌐 senatedems.com/ananich

cc:

U.S. Representative Dan Kildee
Mayor Dayne Walling, City of Flint
Howard Croft, City of Flint
Susan Hedman, EPA
Thomas Poy, EPA
Michael Schock, EPA-ORD
Darren Lytle, EPA-ORD
Denise Fortin, EPA
Dan Wyant, EPA
Jim Sygo, MDEQ
Pat Cook, MDEQ
Stephen Busch, MDEQ
Brad Wurfel, MDEQ
Marc Edwards, Virginia Tech

From: Sygo, Jim (DEQ)
Sent: Friday, October 30, 2015 11:10 AM
To: Kaplan, Robert
Subject: RE: We need to discuss today Deliberative
Attachments: Draft Flint CCT operation letter.docx

Bob,
 Attached is a draft of the letter we will be sending today. I believe it addresses this items identified. Michigan utilizes the Application form submitted by the applicant as the template for the construction permit. That's why your staff were confused because that was part of the application. The operation letter is enforceable by regulation in Michigan.

Please review the draft quickly. If it needs any changes please get them to me by 3:00pm. We will be sending it out at 4:00pm today

Do not release this document until signed and sent to the City of Flint

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 30, 2015

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

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. 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 lead and copper is expected to be completed by a certified lab.

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

DRAFT

Mr. Mike Glasgow

3

October 30, 2015

draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis for lead and copper is expected to be completed by a certified lab. It is recommended that any additional research monitoring should be further evaluated by the City's Technical Advisory Committee prior to being conducted.

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.
Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ

DRAFT

From: Sygo, Jim (DEQ)
Sent: Friday, October 30, 2015 11:23 AM
To: Manning, Peter (AG)

Attorney-Client Privilege

From: Manning, Peter (AG)
Sent: Friday, October 30, 2015 10:52 AM
To: Sygo, Jim (DEQ); Reichel, Robert (AG)

Attorney-Client Privilege

From: Sygo, Jim (DEQ)
Sent: Friday, October 30, 2015 10:32 AM
To: Manning, Peter (AG) <ManningP@michigan.gov>; Reichel, Robert (AG) <ReichelB@michigan.gov>

Attorney-Client Privilege

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 29, 2015 2:51 PM
To: Manning, Peter (AG)
Cc: Sygo, Jim (DEQ)

Attorney-Client Privilege

Liane

From: Sygo, Jim (DEQ)
Sent: Wednesday, November 04, 2015 12:00 PM
To: Manning, Peter (AG)

Attorney-Client Privilege

Begin forwarded message:

From: "Hyde, Tinka" <hyde.tinka@epa.gov>
To: "Willhite, Marcia" <Marcia.Willhite@Illinois.gov>, "Dave McMillan@Illinois.gov" <Dave.McMillan@Illinois.gov>, "CLARK METTLER, MARTHA" <MCLARK@idem.IN.gov>, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, "Monosmith, Carrie (DEQ)" <MONOSMITHC@michigan.gov>, "Benzie, Richard (DEQ)" <BENZIER@michigan.gov>, "randy ellingboe@state.mn.us" <randy.ellingboe@state.mn.us>, "mike.baker@epa.state.oh.us" <mike.baker@epa.state.oh.us>, "jill.jonas@wisconsin.gov" <jill.jonas@wisconsin.gov>, "Patrick.Stevens@Wisconsin.gov" <Patrick.Stevens@Wisconsin.gov>
Cc: "Henry, Timothy" <henry.timothy@epa.gov>, "Poy, Thomas" <poy.thomas@epa.gov>
Subject: HEADS-UP: Clarifications regarding the application of optimal corrosion control requirements of the lead and copper rule

Hi All - Please see the attached memo which provides important clarifications regarding the application of the optimal corrosion control requirements of the lead and copper rule when a large water system ceases to purchase treated water and switches to a new drinking water source. If you have any questions or concerns related to this memo, please contact me or have your staff contact Tom Poy, Chief of the of the Ground Water and Drinking Water Branch at poy.thomas@epa.gov. Thanks

Tinka G. Hyde
 Water Division Director
 USEPA W-15J
 77 W. Jackson Blvd
 Chicago, IL 60604

Office: 312-886-9296
 Cell: 312-735-9428

From: Sygo, Jim (DEQ)
Sent: Wednesday, November 04, 2015 12:02 PM
To: Shekter Smith, Liane (DEQ)
Subject: Fwd: HEADS-UP: Clarifications regarding the application of optimal corrosion control requirements of the lead and copper rule
Attachments: image2015-11-03-155158.pdf, ATT00001.htm

FYI

Sent from my iPhone

Begin forwarded message:

From: "Hyde, Tinka" <hyde.tinka@epa.gov>
To: "Willhite, Marcia" <Marcia.Willhite@Illinois.gov>, "Dave McMillan@illinois.gov" <Dave.McMillan@illinois.gov>, "CLARK METTLER, MARTHA" <MCLARK@idem.IN.gov>, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, "Monosmith, Carrie (DEQ)" <MONOSMITHC@michigan.gov>, "Benzie, Richard (DEQ)" <BENZIER@michigan.gov>, "randy ellingboe@state.mn.us" <randy.ellingboe@state.mn.us>, "mike.baker@epa.state.oh.us" <mike.baker@epa.state.oh.us>, "jill.jonas@wisconsin.gov" <jill.jonas@wisconsin.gov>, "Patrick.Stevens@Wisconsin.gov" <Patrick.Stevens@Wisconsin.gov>
Cc: "Henry, Timothy" <henry.timothy@epa.gov>, "Poy, Thomas" <poy.thomas@epa.gov>
Subject: HEADS-UP: Clarifications regarding the application of optimal corrosion control requirements of the lead and copper rule

Hi All - Please see the attached memo which provides important clarifications regarding the application of the optimal corrosion control requirements of the lead and copper rule when a large water system ceases to purchase treated water and switches to a new drinking water source. If you have any questions or concerns related to this memo, please contact me or have your staff contact Tom Poy, Chief of the of the Ground Water and Drinking Water Branch at poy.thomas@epa.gov. Thanks

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
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 

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.

²U.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/Exe/ZvPDF.cgi?DocId=91019DM4.txt>.

From: Sygo, Jim (DEQ)
Sent: Thursday, November 05, 2015 7:08 PM
To: JoAnn Merrick
Subject: Re: Expert says Michigan officials changed a Flint lead report to avoid federal action

You know my comment!

Sent from my iPhone

> On Nov 5, 2015, at 5:58 PM, JoAnn Merrick <jmerrick47@gmail.com> wrote:

>

> <http://www.michrad.io/1X5lrzY>

> This was posted in Facebook 😊 Have you seen it?

>

> Sent from my iPhone

From: Sygo, Jim (DEQ)
Sent: Friday, November 06, 2015 8:41 AM
To: Hirst, Laura (OAG)
Subject: Flint Drinking Water
Attachments: Transmittal of Final Report - High Lead at Three Residences in Flint, Michigan; HEADS-UP: Clarifications regarding the application of optimal corrosion control requirements of the lead and copper rule

Laura,

We met when you and Doug came over for signatures to release our e-mails.

I thought I would pass along 2 letters that we just received from the Environmental Protection Agency. It reexamines several of the positions that EPA staff were taking during conversations with our staff about the Lead/Copper Rule.

From: Hyde, Tinka [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
Attachments: Transmittal of Final redacted Report to MDEQ.pdf

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: PPI



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.

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 leaded 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

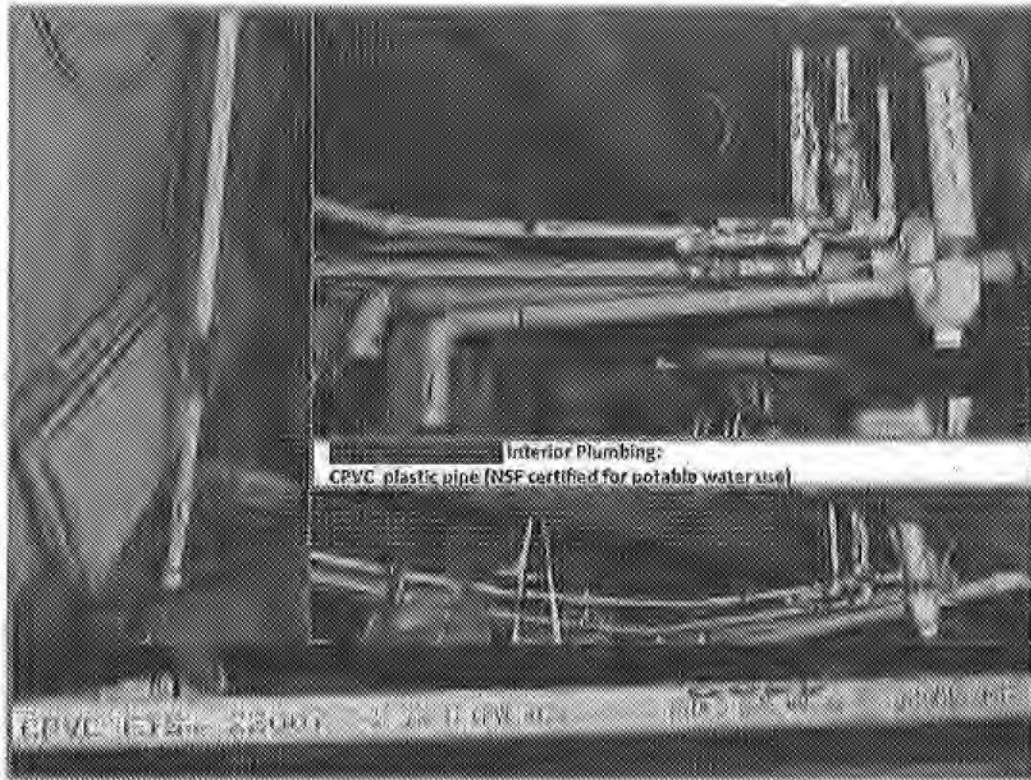
Sampling Sites

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]

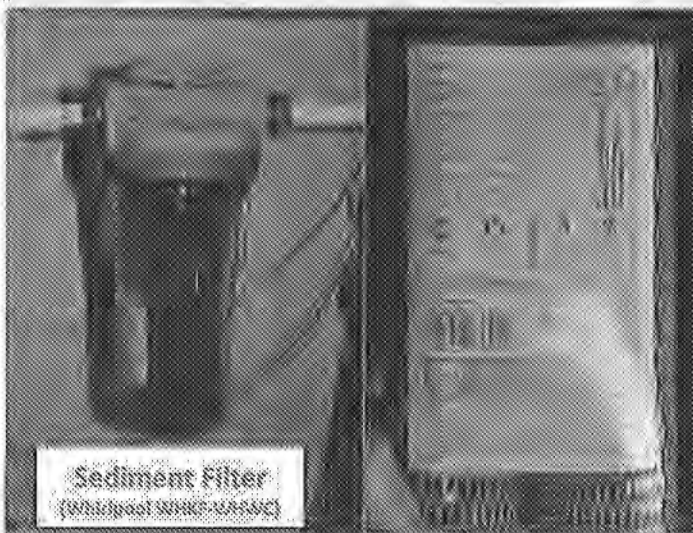
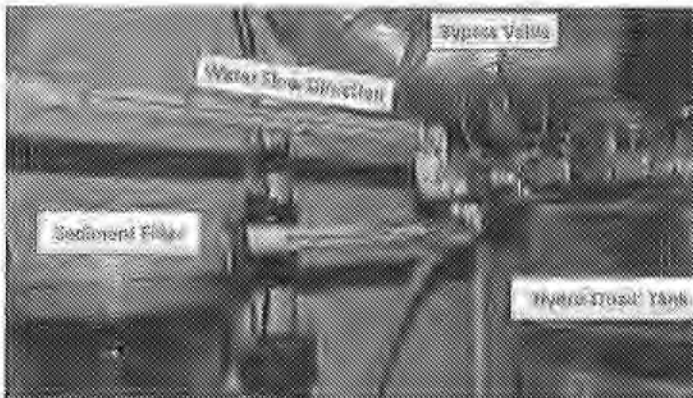
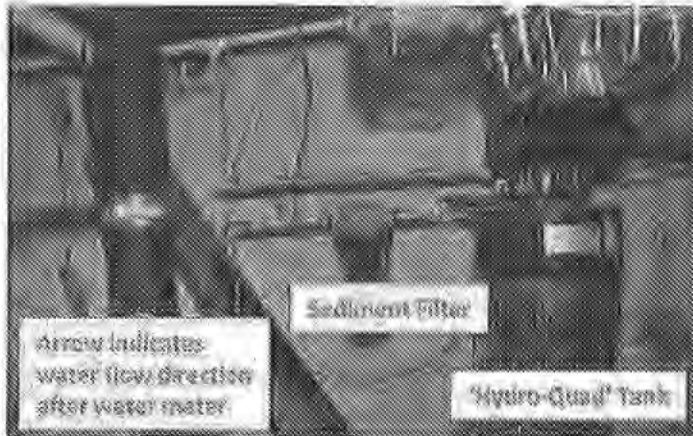
Internal Plumbing – [REDACTED]

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.



Treatment Units –

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

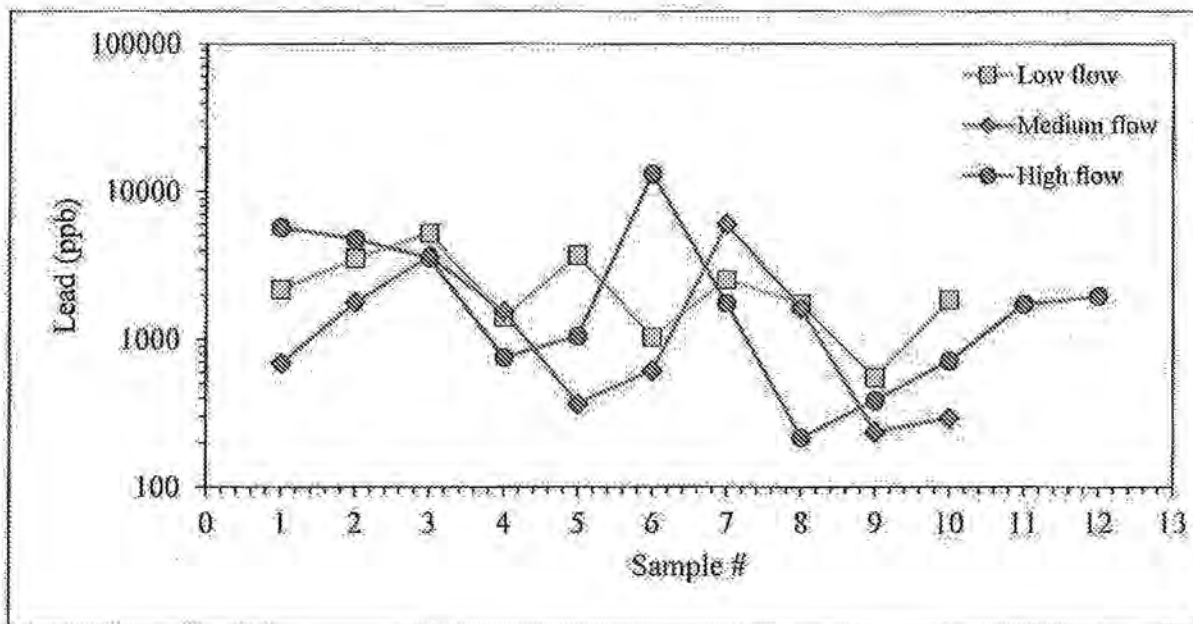
March 3, 2015: 397 µg/L

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).



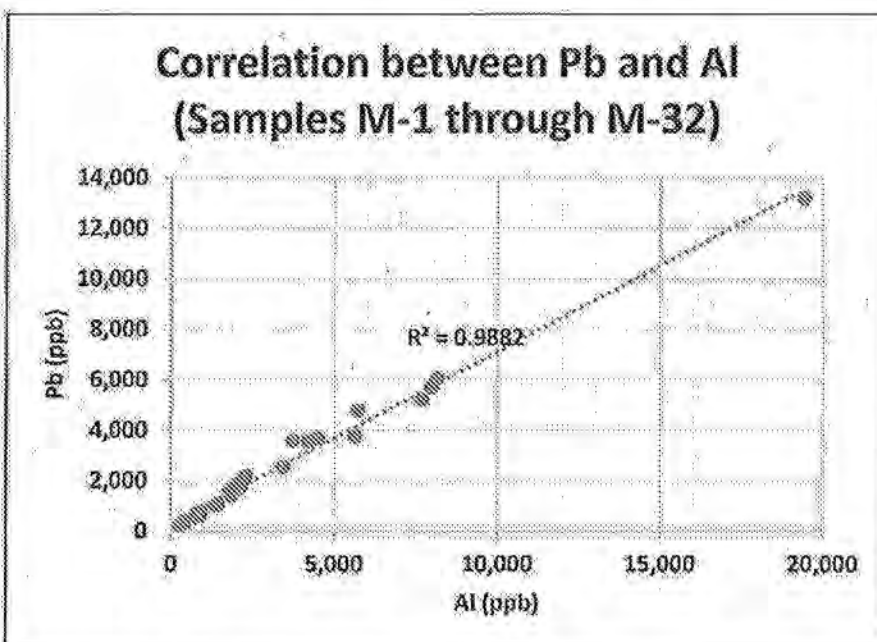
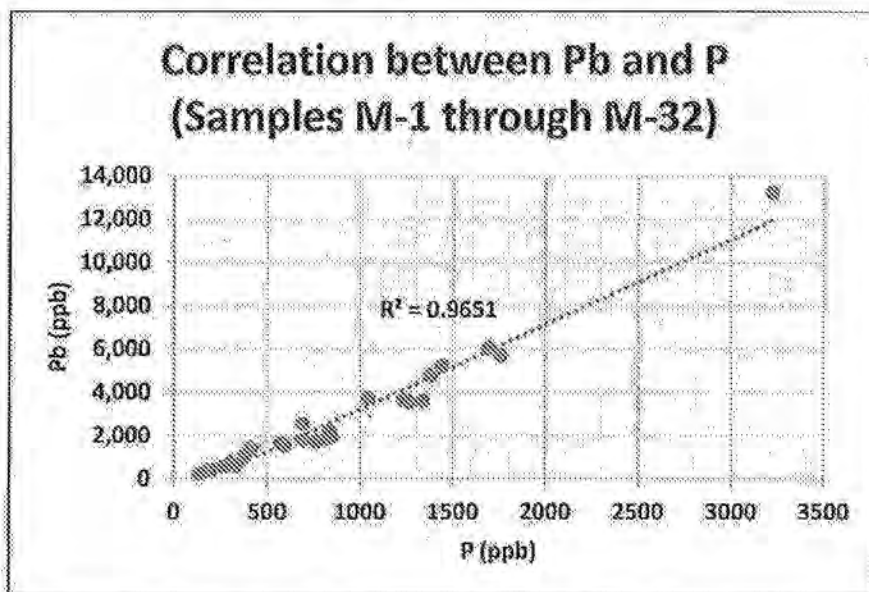
Element (units)	Low Flow									
	1 L Sample Bottle							125 mL Sample Bottle		
	M-1	M-2	M-3	M-4	M-5	M-6	M-7	M-21	M-22	M-23
Ag (ppb)	0	0	0	0	0	0	0	0	0	0
Al (ppb)	2,285	4,199	7,683	1,856	5,623	1,422	3,413	1,865	666	2,015
As (ppb)	3.3	3.9	4	2	3.2	2	2.6	3.6	1.9	3.1
Ba (ppb)	31.3	39.8	27.7	21.2	24.2	20.9	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
Ti (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

High Flow												
Element (units)	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
Tl (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

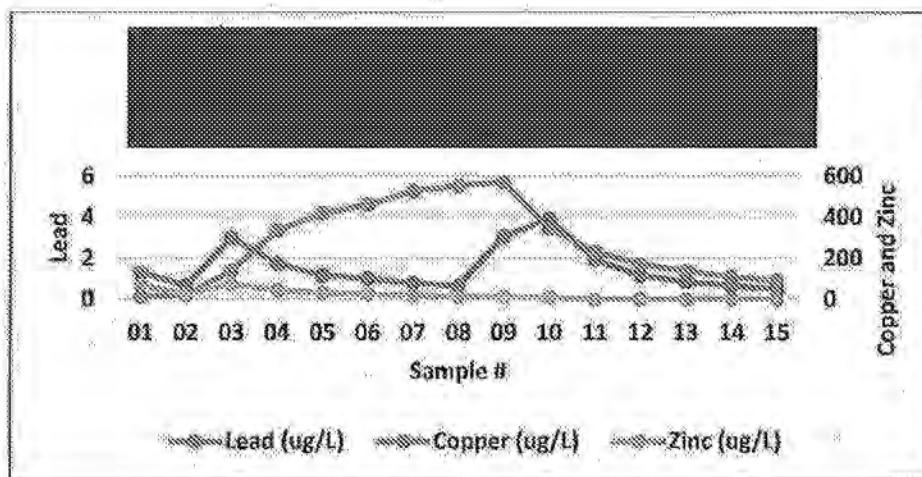
The correlation of lead and phosphate, as well as lead and aluminum, indicate that the samples were captured scale and sediment that had formed inside the pipes while the City of Flint was purchasing water from Detroit. The absence of these chemicals in the current treatment provided by Flint indicate 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

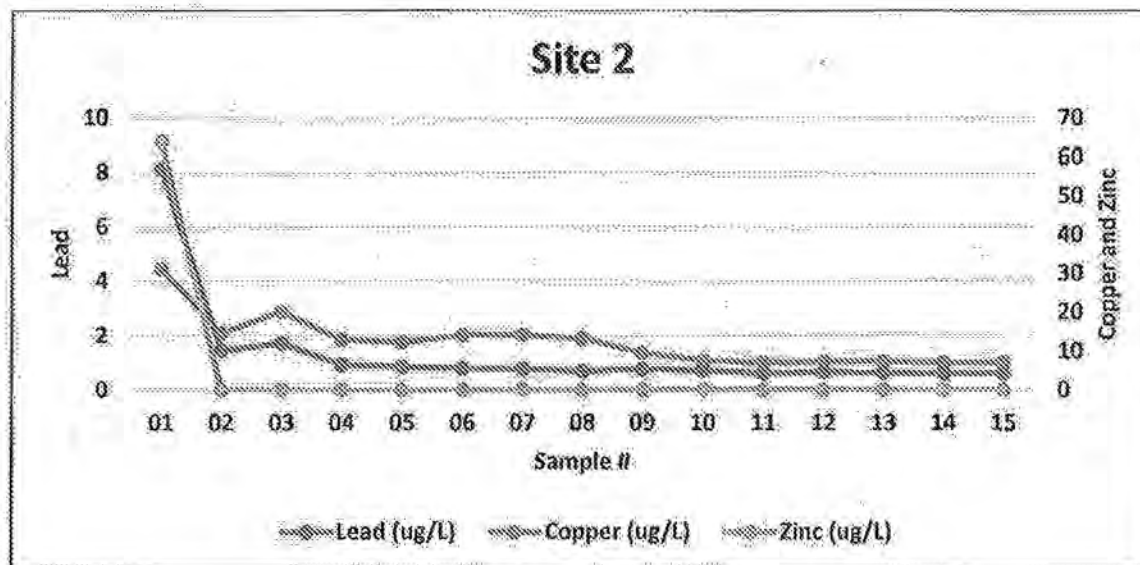
██████████ (██████████ home)

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.



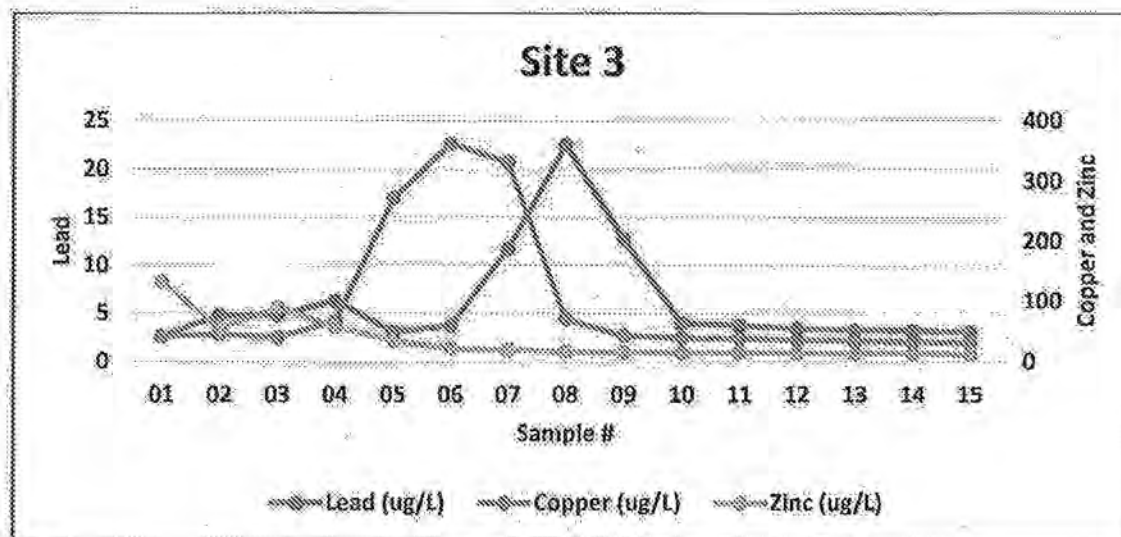
Site 2

(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

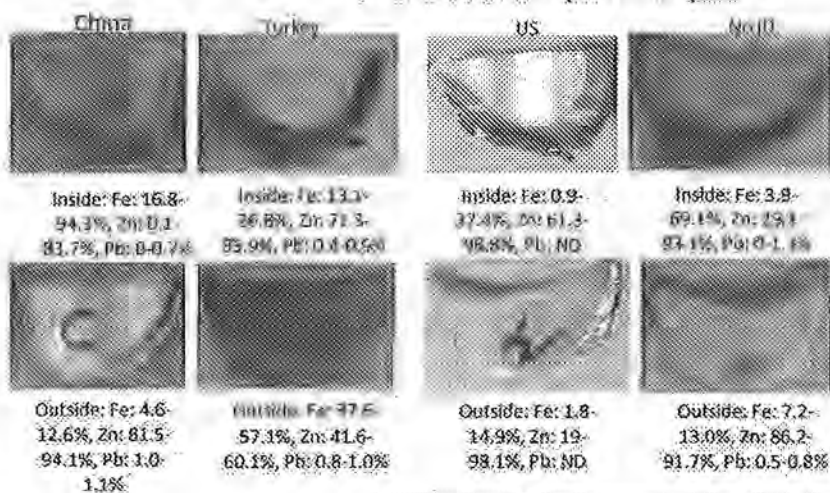
Sample #	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	40.7	2.63	132	U	0.0622	U
02	44.4	4.77	55.3	U	0.249	U
03	39.3	4.79	88.8	U	0.179	U
04	66.8	6.26	57.2	U	0.346	U
05	272	3.07	34.2	U	0.105	U
06	362	3.7	21.4	U	0.0598	U
07	331	11.7	19.5	U	0.0512	U
08	69.9	22.5	16.6	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.

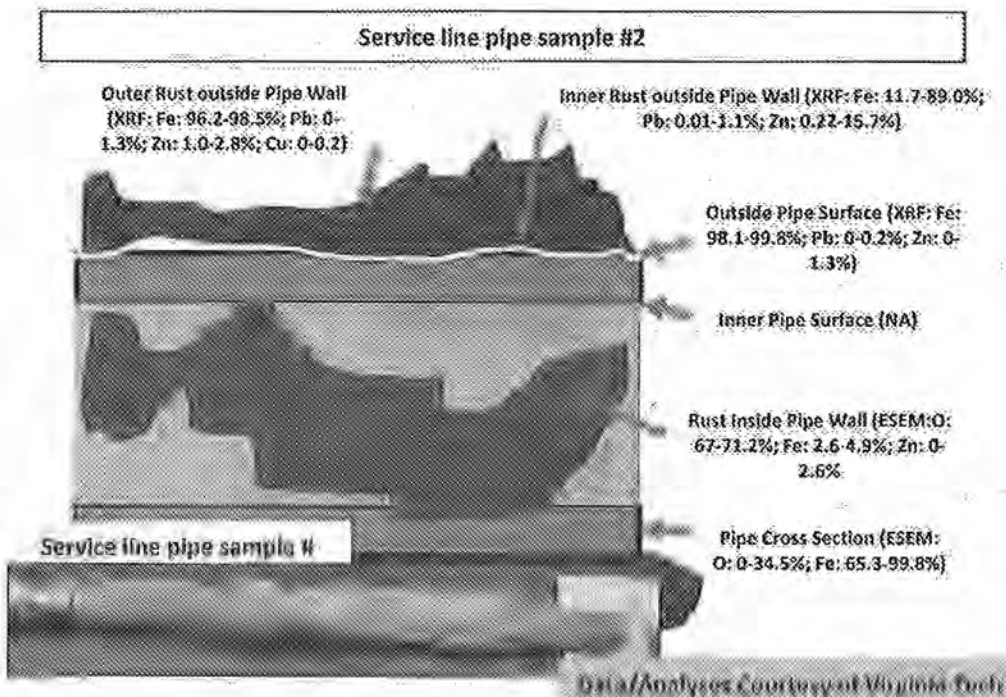
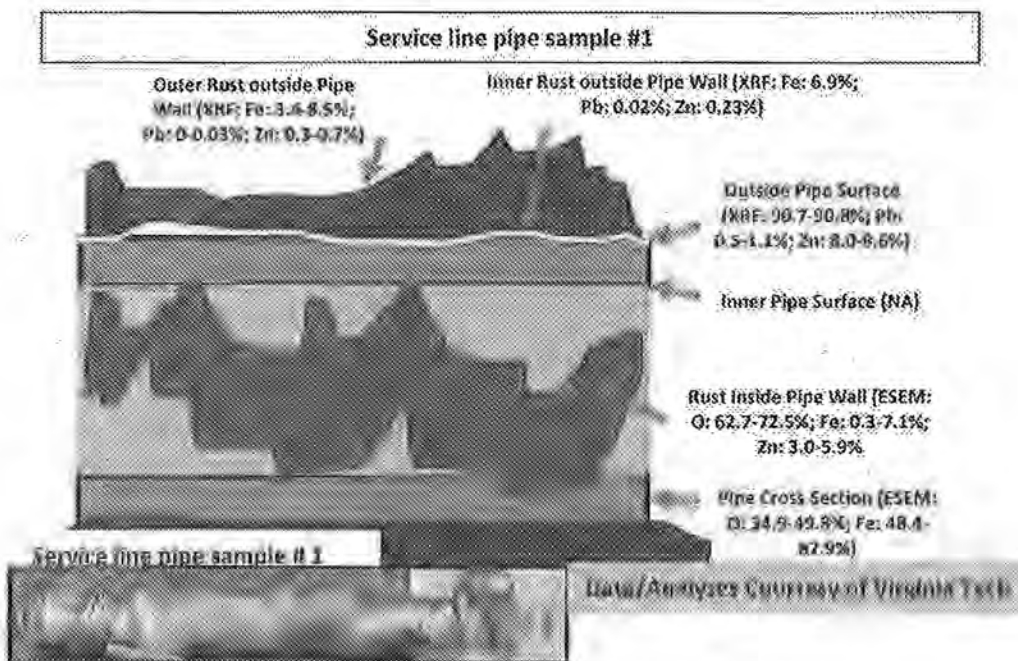
The images and data presented below are for a typical range of galvanized iron pipe.

Lead Content of Galvanized Iron Pipe - Examples



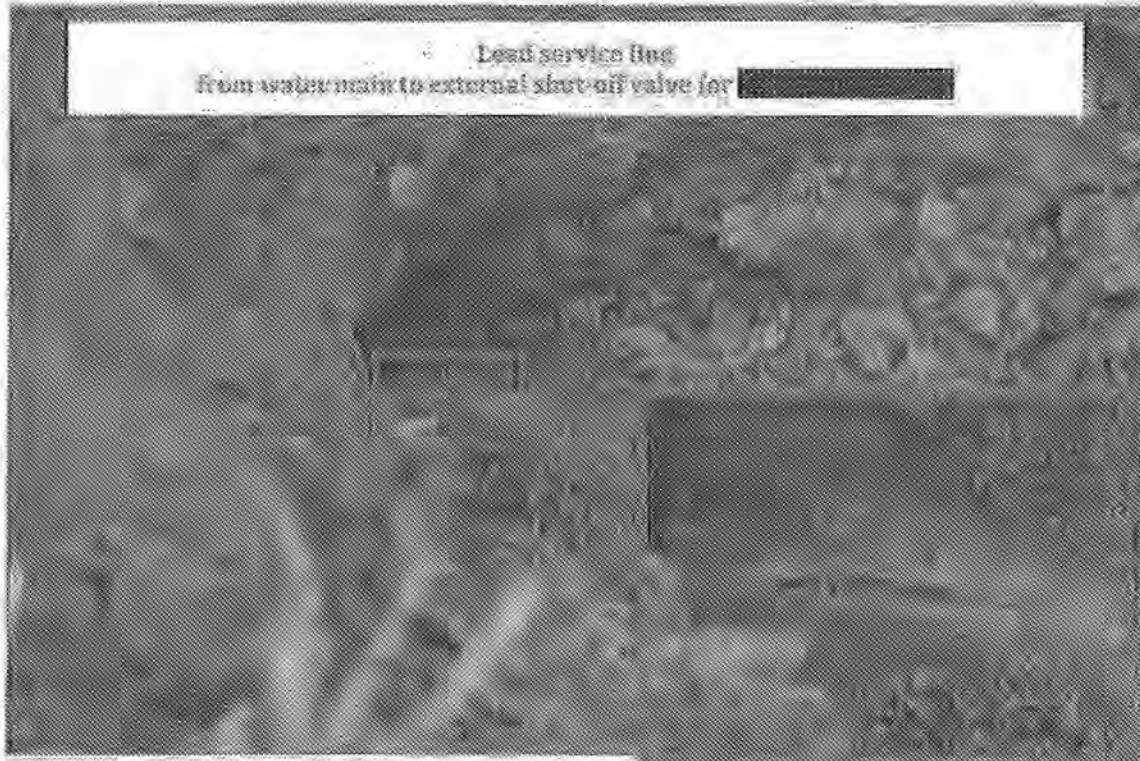
Data/Analyses Courtesy of Virginia Tech

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

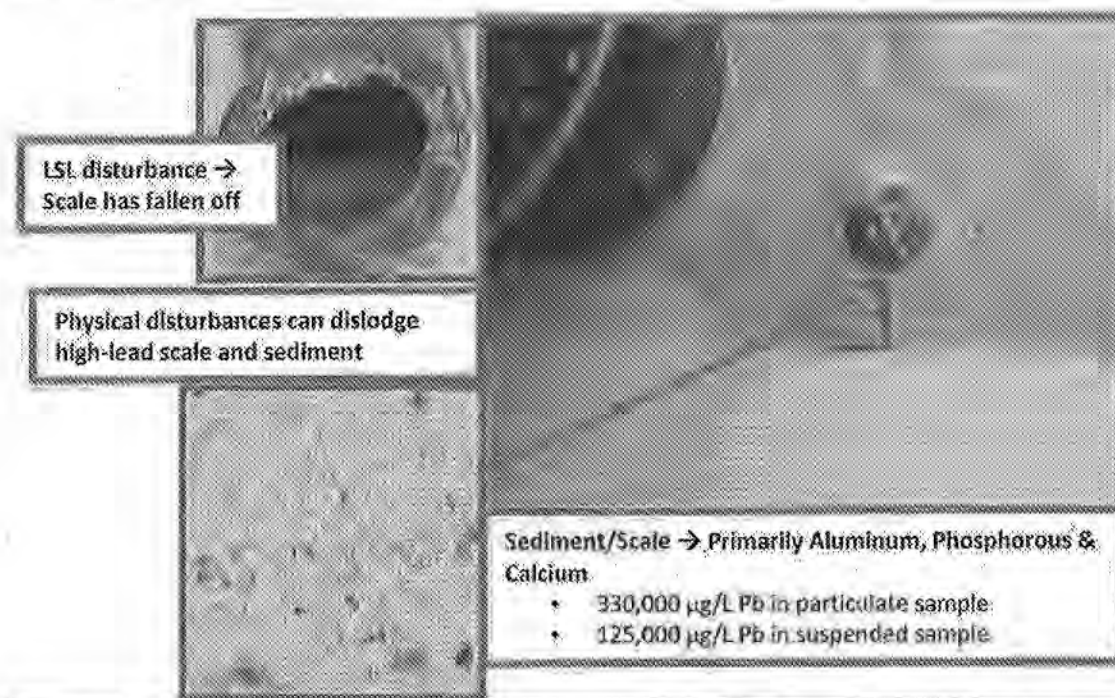
Lead service lines can contribute up to 75 percent of the total mass release into the water. The portion of the [REDACTED] original service line from the water main to the external shut-off valve at the corner of [REDACTED] and Bryant Street is made of lead and is estimated to be approximately 25 feet 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, scudiznyite	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	$Pb_3(SO_4)(CO_3)_2(OH)_2$	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	$Pb_3(PO_4)_2$	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.

From: Hyde, Tinka <hyde.tinka@epa.gov>
Sent: Wednesday, November 04, 2015 11:26 AM
To: Willhite, Marcia; Dave.McMillan@illinois.gov; CLARK METTLER, MARTHA; Sygo, Jim (DEQ); Monosmith, Carrie (DEQ); Benzie, Richard (DEQ); randy.ellingboe@state.mn.us; mike.baker@epa.state.oh.us; jill.jonas@wisconsin.gov; Patrick.Stevens@Wisconsin.gov
Cc: Henry, Timothy; Poy, Thomas
Subject: HEADS-UP: Clarifications regarding the application of optimal corrosion control requirements of the lead and copper rule
Attachments: image2015-11-03-155158.pdf; ATT00001.txt

Hi All - Please see the attached memo which provides important clarifications regarding the application of the optimal corrosion control requirements of the lead and copper rule when a large water system ceases to purchase treated water and switches to a new drinking water source. If you have any questions or concerns related to this memo, please contact me or have your staff contact Tom Poy, Chief of the of the Ground Water and Drinking Water Branch at poy.thomas@epa.gov. Thanks

Tinka G. Hyde
Water Division Director
USEPA W-15J
77 W. Jackson Blvd
Chicago, IL 60604

Office: 312-886-9296

Cell: PPI

From: Sygo, Jim (DEQ)
Sent: Tuesday, November 10, 2015 12:43 PM
To: Pallone, Maggie (DEQ)
Subject: Fwd: Lead and Copper Rule Compliance Sampling Sites Letter
Attachments: Flint lead serv. ltr.pdf; ATT00001.htm

Here is the letter.

Sent from my iPhone

Begin forwarded message:

From: "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>
Date: November 9, 2015 at 2:06:12 PM EST
To: "Robert Kaplan (kaplan.robert@epa.gov)" <kaplan.robert@epa.gov>
Cc: "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
Subject: FW: Lead and Copper Rule Compliance Sampling Sites Letter

Bob,

Per Jim's request please see out letter, attached.

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: Busch, Stephen (DEQ)
Sent: Monday, November 09, 2015 2:04 PM
To: mglasgow@cityofflint.com
Cc: nhenderson@cityofflint.com; Howard Croft (hcroft@cityofflint.com); Brent Wright (bwright@cityofflint.com); rbincsik@cityofflint.com; prysbvm@michigan.gov
Subject: Lead and Copper Rule Compliance Sampling Sites Letter

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

From: Sygo, Jim (DEQ)
Sent: Thursday, November 12, 2015 5:13 PM
To: Benzie, Richard (DEQ)
Subject: RE: phone conversation follow-up

Let me get back to you on this.

-----Original Message-----

From: Benzie, Richard (DEQ)
Sent: Thursday, November 12, 2015 5:09 PM
To: Sygo, Jim (DEQ)
Subject: FW: phone conversation follow-up

Jim,

Steve Via is the Regulatory Affairs Manager for the American Water Works Association in Washington, D.C. He contacted us earlier this month to provide some information regarding LCR implementation in other states and in certain water systems that are members of their association. I contacted him again earlier this week to ask for documentation about other state programs.

During our conversation, Steve indicated that the national AWWA is planning to have the topic of lead in drinking water and Flint on the agenda of their 2016 Annual Conference next June, which is in Chicago. He mentioned that there may be an opportunity for Michigan DEQ to provide their story.

Below is a follow-up message I received today indicating that Darren Lytle from EPA and a member of the Flint Technical Advisory Workgroup/Committee is planning to present at their conference, and Mike (Glasgow, I believe) is likely to give a presentation as well. Steve is wondering if we would like a slot on the panel/session. I told him I would elevate the request, but I wasn't sure if we would be able to do so or if we were able, who would be doing such a presentation.

Is this request to speak something we can tentatively agree to do at this time, with the caveat that we would have to cancel if circumstances should warrant doing so before next June? Let me know what you think.

Thanks,
Richard

-----Original Message-----

From: Steve Via [mailto:sh_via@comcast.net]
Sent: Thursday, November 12, 2015 11:56 AM
To: Benzie, Richard (DEQ)
Subject: phone conversation follow-up

Richard,

Darren is OK with presenting at ACE on Flint. Mike may present as well. When you and I spoke, we touched on MI presenting as well and my impression was that you all were likely not available. With Darren and Mike speaking do you all want a slot in panel?

Thanks,
Steve

Typed with two fingers on a smartphone

From: Sygo, Jim (DEQ)
Sent: Sunday, November 15, 2015 12:21 AM
To: Pallone, Maggie (DEQ)

Attorney-Client Privilege

On Nov 14, 2015, at 5:29 PM, Pallone, Maggie (DEQ) <PalloneM@michigan.gov> wrote:

Attorney-Client Privilege

From: "Shekter Smith, Liane (DEQ)" <SHEKTERL@michigan.gov>
Date: November 14, 2015 at 4:41:21 PM EST
To: "Kuhl, Richard (AG)" <KuhlR@michigan.gov>, "Bettenhausen, Margaret (AG)" <BettenhausenM@michigan.gov>
Cc: "Devereaux, Tracy Jo (DEQ)" <DEVEREAUXT@michigan.gov>, "Thelen, Mary Beth (DEQ)" <THELENM2@michigan.gov>, "Shaler, Karen (DEQ)" <SHALERK@michigan.gov>, "Benzie, Richard (DEQ)" <BENZIER@michigan.gov>, "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>, "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>, "Philip, Kris (DEQ)" <PHILIPK@michigan.gov>, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>, "Wyant, Dan (DEQ)" <WyantD@michigan.gov>, "Anderson, Madhu (DEQ)" <AndersonM30@michigan.gov>, "Tommasulo, Karen (DEQ)" <TommasuloK@michigan.gov>, "Wurfel, Brad (DEQ)" <WurfelB@michigan.gov>, "Pallone, Maggie (DEQ)" <PalloneM@michigan.gov>, "Krisztian, George (DEQ)" <krisztian@michigan.gov>

Attorney-Client Privilege

Attorney-Client Privilege

From: Shekter Smith, Liane (DEQ)

Sent: Saturday, November 14, 2015 2:46 PM

To: Kuhl, Richard (AG); Bettenhausen, Margaret (AG); Sygo, Jim (DEQ); Krisztian, George (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Anderson, Madhu (DEQ); Wyant, Dan (DEQ)

Cc: Devereaux, Tracy Jo (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ); Philip, Kris (DEQ)

Attorney-Client Privilege

From: Shekter Smith, Liane (DEQ)

Sent: Friday, November 13, 2015 6:03 PM

To: Kuhl, Richard (AG); Bettenhausen, Margaret (AG); Sygo, Jim (DEQ); Krisztian, George (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Anderson, Madhu (DEQ); Wyant, Dan (DEQ)

Cc: Devereaux, Tracy Jo (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)

Attorney-Client Privilege

From: Sygo, Jim (DEQ)
Sent: Wednesday, November 18, 2015 4:56 PM
To: Keith Flynn
Cc: Pallone, Maggie (DEQ)
Subject: RE: REP PHELPS FOIA REQUEST
Attachments: Fwd: Legislative Inquiry

Keith,

Maggie Pallone is handling the request, pursuant to a note received from Representative Phelps. The note is attached. The rewording of what is requested is extensive and is in the process of being assembled. I do not have a date when this is expected to be completed as yet. As soon as we have any further information, we will contact Representative Phelps and you with a completion date.

From: Keith Flynn [mailto:kflynn@millercohen.com]
Sent: Wednesday, November 18, 2015 2:36 PM
To: Sygo, Jim (DEQ)
Subject: RE: REP PHELPS FOIA REQUEST

Jim:

It's been over two weeks since our meeting where we were told that there was correspondence between the DEQ and the City of Flint regarding a the waiver of the permit requirement. We were promised that your office would search for that correspondence and provide it to Representative Phelps.

We have not heard anything back from the DEQ since that meeting.

Please advise when we can anticipate a response.

Thank you.

Keith D. Flynn
Attorney at Law
Miller Cohen, P.L.C.
600 West Lafayette Blvd., Fourth Floor
Detroit, MI 48226-0840
(313) 964-4454
Fax: (313) 964-4490

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From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Friday, October 23, 2015 2:29 PM
To: Keith Flynn <kflynn@millercohen.com>
Cc: Shaler, Karen (DEQ) <SHALERK@michigan.gov>
Subject: Re: REP PHELPS FOIA REQUEST

Friday at 2:00 pm would be fine if we could meet in Lansing.

I'd suggest constitution hall. If our discussions identify what documents are being requested way be able to access them to see if that is being requested.

Sent from my iPhone

On Oct 23, 2015, at 1:55 PM, Keith Flynn <kflynn@millercohen.com> wrote:

Good afternoon.

How does Thursday or Friday of next week work to discuss a possible resolution to Representative Phelps' FOIA request? I intend on being there along with a staffer from Representative Phelps' office. Who will be there on behalf of the DEQ? Also, what time and location works for you?

Thank you.

Keith D. Flynn
 Attorney at Law
 Miller Cohen, P.L.C.
 600 West Lafayette Blvd., Fourth Floor
 Detroit, MI 48226-0840
 (313) 964-4454
 Fax: (313) 964-4490

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From: Pallone, Maggie (DEQ)
Sent: Thursday, November 05, 2015 4:50 PM
To: DEQ-Legislative-Contact
Cc: Sygo, Jim (DEQ)
Subject: Fwd: Legislative Inquiry

Please assign to ODWMA. We can meet to discuss if they would like.

Thanks
Maggie

Begin forwarded message:

From: Phil Phelps <philphelps@house.mi.gov>
Date: November 5, 2015 at 4:47:36 PM EST
To: "pallonem@michigan.gov" <pallonem@michigan.gov>
Cc: Allison Glasson <AMGlasson@house.mi.gov>, "kflynn@millercohen.com" <kflynn@millercohen.com>
Subject: Legislative Inquiry

Maggie,

While I am not withdrawing my FOIA, I am willing to clarify my intent informally as a legislative inquiry. I would like all communications between the City of Flint and the MDEQ referencing the use of the Flint river as a Water source including copies of emails. I would also like all internal communications referencing Flint drinking water between individuals employed by the MDEQ or working on their behalf. I would also like any communications between the MDEQ and all other government employees or elected and appointed officials at the state and federal level if anything to do with Flint drinking water was referenced. I would also like any documentation your department has on Flint using the Flint River as its primary water source, as well as any studies or information on the quality of the Flint River or any reference to contamination or treatment of the Flint River as a primary source. For all of the information requested please also include any and all drafts of documents and communications, even if it was a draft for a document that was never published or made public. For all of the requests listed above, please send information that was created or drafted on or after January 1st, 2011.

Thank you,
Phil Phelps

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.

From: Sygo, Jim (DEQ)
Sent: Tuesday, November 24, 2015 12:22 PM
To: Kaplan, Robert (kaplan.robert@epa.gov)
Subject: Eisenhower Elementary School Report
Attachments: EisenhowerElementary_Report.pdf

Attached is the second report which has been finished.

We have now sampled 8 of the 13 public schools and hope to catch up on the reports over the next 2 weeks.

From: Sygo, Jim (DEQ)
Sent: Wednesday, November 25, 2015 8:04 AM
To: LeeWalters
Subject: Re: Questions About City Of Flint Water

The city reported yesterday that the pumps would be arriving today and they expect to have them installed and delivering the phosphate dosing by the end of next week.

The Flint River will remain the city's emergency source, but with corrosion control treatment once KWA comes on line next year.

There are multiple reasons for experiencing discolored water, particularly when dealing with a distribution system that is old with valves that are not functioning properly. I can't speculate what is causing the problem you are experiencing.

We have recommended notification to residents of flushing operations to the city as a standard practice. The DEQ is not an operator of the system so we do not direct flushing of the system.

DEQ would not support blending two different sources of water. This can make treatment much more difficult. I am not familiar with the Y pipe that you indicate was already installed, but will look into this next week.

Sent from my iPhone

On Nov 25, 2015, at 12:03 AM, LeeWalters <lwalters313@gmail.com> wrote:

Mr. Sygo

My name is LeeAnne Walters and I have a few questions about our water.

The first question what is the status of the pumps that are supposed to be installed for the ortho phosphates?

The second question is once the switch to the KWA happens, what will be the emergency water source for the City of Flint? Will it be Detroit or Flint River

Third question is a few months back Howard Croft confirmed a Y was installed at the water treatment plant to blend the untreated lake water with the Flint river water if needed. Will this still be happening/and or an option to happen.

I dont know if you are aware and I can provide pictures if you would like of the brown water that is coming out of people's taps because of the hydrant flushing. The city has been contacted multiple times and no answers have been given. Why are the people not being made aware of the flushing and contacted before it happens. Why is there no notification from the city or the MDEQ.

Respectfully
LeeAnne Walters

From: Sygo, Jim (DEQ)
Sent: Tuesday, December 01, 2015 9:06 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Fwd: Questions About City Of Flint Water

Please propose a response for me

Sent from my iPhone

Begin forwarded message:

From: LeeWalters <lwalters313@gmail.com>
Date: November 25, 2015 at 12:03:16 AM EST
To: <SygoJ@michigan.gov>
Subject: Questions About City Of Flint Water

Mr. Sygo

My name is LeeAnne Walters and I have a few questions about our water.

The first question what is the status of the pumps that are supposed to be installed for the ortho phosphates?

The second question is once the switch to the KWA happens, what will be the emergency water source for the City of Flint? Will it be Detroit or Flint River

Third question is a few months back Howard Croft confirmed a Y was installed at the water treatment plant to blend the untreated lake water with the Flint river water if needed. Will this still be happening/and or an option to happen.

I dont know if you are aware and I can provide pictures if you would like of the brown water that is coming out of people's taps because of the hydrant flushing. The city has been contacted multiple times and no answers have been given. Why are the people not being made aware of the flushing and contacted before it happens. Why is there no notification from the city or the MDEQ.

Respectfully
LeeAnne Walters

From: Sygo, Jim (DEQ)
Sent: Tuesday, December 01, 2015 12:11 PM
To: Shaler, Karen (DEQ)
Subject: FW: EPA Flint Task Force -- Draft Preliminary Assesment for discussion
Attachments: EPA Task Force Recommendations Final Draft November 24 2015.pdf

To Print

From: Kaplan, Robert [<mailto:kaplan.robert@epa.gov>]
Sent: Wednesday, November 25, 2015 10:01 AM
To: Sygo, Jim (DEQ)
Subject: EPA Flint Task Force -- Draft Preliminary Assesment for discussion

Jim,

As we discussed on the call yesterday, I've attached the draft Task Force Recommendations for optimization of corrosion control, both for current water supply and for the switch to KWA water). We wanted to share this draft with MDEQ first and get feedback prior to our meeting on December 11. Note that several sections are omitted pending further discussion, including specific funding estimates and outreach to Flint.

Thanks,

Bob

From: Sygo, Jim (DEQ)
Sent: Tuesday, December 08, 2015 12:46 PM
To: Kaplan, Robert (kaplan.robert@epa.gov)
Subject: Brownell Academy Report and data
Attachments: BrownellAcademy_Report.pdf; Brownell Spreadsheet.pdf

Bob,
Attached is the report on the Brownell Academy.
Should be goin onto the web site tomorrow.

BROWNELL STEM ACADEMY

Outlet Sampling and Plumbing Assessment Recommendations

6302 Oxley Drive, Flint, Michigan 48504



BACKGROUND INFORMATION

On Friday, October 30, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of the plumbing system at Brownell STEM Academy to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

- Lead solder joints on copper piping
- Brass valves and brass fittings
- Brass components in fixtures
- Galvanized piping

The assessment also identified a total of 23 faucets or fountains that provide water for drinking, cooking and/or food preparation. The team developed a sequence for sampling the faucets/fountains based on how water travels through the school building.

On Saturday, October 31, 2015, the DEQ and the DLARA completed sampling of the 23 faucets/fountains in the Brownell STEM Academy school building in the order determined by the plumbing assessment from the previous day, following a stagnation period of over 12 hours. At each of the 23 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F01) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F02) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

The DEQ and the DLARA then completed consecutive sampling at three of the 23 faucets/fountains in the Brownell STEM Academy school building. This consecutive sampling was used to determine the impact of any lead sources located deep in the supply plumbing of the school building. The three sites included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these three sites, staff collected ten, 1-liter samples. The ten samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between.

WATER SERVICE INFORMATION

A four-inch diameter cast iron water service line enters the main school building in the mechanical room located in the middle of the building. Piping in the boiler room immediately transitions into galvanized metal piping and then into copper piping with lead solder joints for cold water lines. Two separate copper cold water supply lines exit the mechanical room. One through the north wall in the west corner appears to serve fixtures in the north end of the main wing of the school building. A second line exits the south wall and appears to serve fixtures in the south end of the main wing, and then continues over and serves fixtures in the west wing of the school building. Copper piping with lead solder joints branches off of the copper supply lines. Hot water is distributed in continuous loops that feed from and return to a central water heater in the mechanical room. Hot water piping material, where exposed, was copper piping with lead solder joints. Brass valves were seen throughout the building.

Outlets With Lead Levels Greater Than 15 Parts per Billion

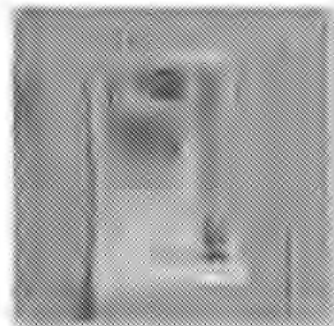
The DEQ recommends school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 23 faucets/fountains on October 31, 2015, the following 12 drinking water outlets had lead water level results greater than 15 parts per billion. Each of these 12 outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

Outlet: Bubbler Drinking Fountain (DW001)

Location: North Hallway, across from Classroom 12

Results: P1=64 parts per billion, P2=4 parts per billion
F01=2 parts per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



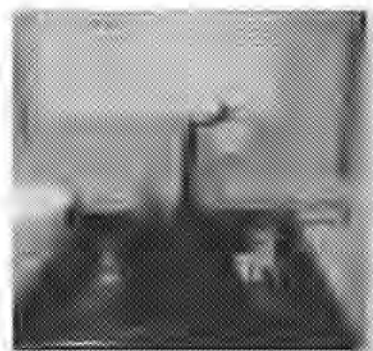
Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Laboratory Sink Faucet, Right (CF004)

Location: Classroom 17, west wall

Results: P1=56 parts per billion, P2=29 parts per billion,
F01=7 parts per billion, F02=3 parts per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. This faucet appears to be constructed of coated brass. Connecting plumbing for this faucet was not accessible, but should be checked for additional lead containing components, including brass fittings and a brass valve.



Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Laboratory Sink Faucet, Left (CF005)

Location: Classroom 17, west wall

Results: P1=31 parts per billion, P2=6 parts per billion,
F01=2 parts per billion, F02=1 part per billion

NO IMAGE
AVAILABLE

These results suggest the highest contribution of lead may be from the faucet itself. This faucet appears to be constructed of coated brass. Connecting plumbing for this faucet was not accessible, but should be checked for additional lead containing components, including brass fittings and a brass valve.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet, Left (CF007)

Location: Classroom 26, south wall

Results: P1=164 parts per billion, P2=166 parts per billion,
F01=15 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Hot and cold water lines connect to this faucet with a brass mixer fitting under the sink. Connecting plumbing in the cabinet under the sink is copper piping with lead solder and contains additional brass components and brass shutoff valves.

Copper results for samples P1 and P2 at this location were also at levels above which the DEQ recommends school facilities take action. Copper results suggest these same brass components are contributing to this condition.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead and copper exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

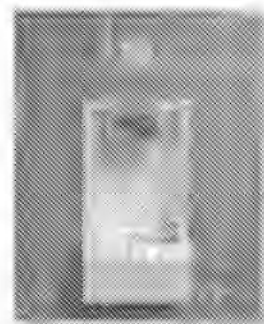


Outlet: Bubbler Drinking Fountain, Right (DW008)

Location: South Hallway, across from Classroom 26

Results: P1=46 parts per billion, P2=11 parts per billion,
F01=4 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including a brass valve.



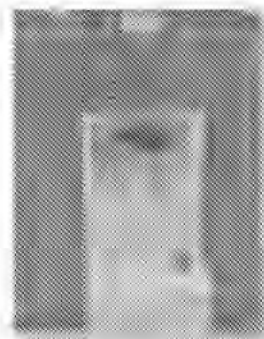
Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Left (DW009)

Location: South Hallway, across from Classroom 26

Results: P1=23 parts per billion, P2=7 parts per billion,
F01=3 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass, has a brass connection on the underside of the unit, and a brass operating valve on the side of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



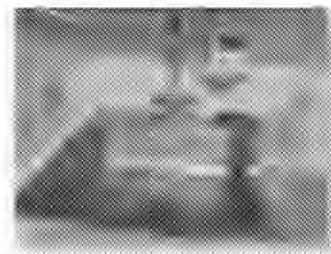
Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF010)

Location: Room 27 Lounge, north wall

Results: P1=25 parts per billion, P2=34 parts per billion,
F01=2 parts per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink includes brass connectors and brass shut off valves.



Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Left (DW013)

Location: West Wing South Hallway, between Classrooms 1 and 2

Results: P1=27 parts per billion, P2=15 parts per billion,
F01=8 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



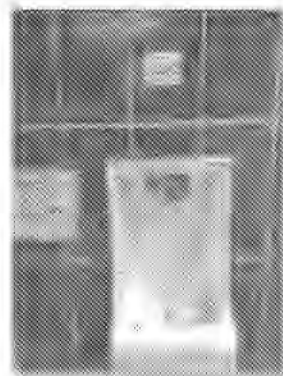
Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Right (DW014)

Location: West Wing South Hallway, between Classrooms 1 and 2

Results: P1=16 parts per billion, P2=3 parts per billion,
F01=2 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (KC019)

Location: Classroom 4, east wall

Results: P1=16 parts per billion, P2=10 parts per billion,
F01=non-detect, F02=non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass. Connecting plumbing for this faucet should be checked for additional lead containing components, including brass fittings and brass valves.



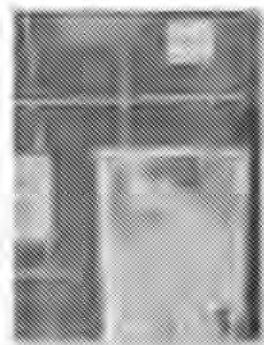
Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Right (DW020)

Location: West Wing North Hallway, between Classrooms 6 and 7

Results: P1=33 parts per billion, P2=15 parts per billion,
F01=20 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Left (DW021)

Location: West Wing North Hallway, between Classrooms 6 and 7

Results: P1=38 parts per billion, P2=27 parts per billion,
F01=2 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 11 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

The fourth sample (F02) at all 23 outlets following approximately three minutes of use and flushing at a reduced flow resulted in reduced lead concentrations of 3 parts per billion or less. This indicates that flushing of all taps used for drinking, cooking, and/or food preparation for four minutes following periods of stagnation will further reduce lead exposure. It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance with emphasis on flushing after weekends and holidays.

Five of these 11 outlets are comprised of similar materials as the outlets listed above and could potentially experience higher lead levels under extended periods of stagnation. These faucets/fountains include:

- Bubbler Drinking Fountain Unit in North Hallway, across from Classroom 12 (DW002)
- Chrome Plated Brass Base Faucets in Classroom 15 (CF003), Classroom 26 (CF006), Classroom 6 (CF022), and Classroom 7 (CF023)

Replacement of these fixtures with lead-free materials is also recommended.

The remaining six outlets showed sample results of 15 parts per billion or less, requiring no further action or additional recommendations. These faucets/fountains include:

- Kitchen Faucets in the Community Room (CF012), Classroom 2 (KC017), and two in Classroom 1 (KC015 and KC016).
- Integrated Bubbler Faucet in the Classroom 4 restroom (CF018)
- Water Cooler in the hallway east of the Gym (WC011)

Consecutive Sampling Results and Building Plumbing Recommendations

The consecutive samples taken on October 31, 2015, at three sites in the Brownell STEM Academy school building provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the school building. However, results from Classroom 17 also suggest that the copper supply line with lead solder joints serving the north hallway in the main wing may contain more stagnant water due to the limited number of fixtures served by this line and their lack of use. A flushing operational procedure may further reduce lead contributions from this supply line caused by stagnant conditions related to its use. Results of the consecutive sample monitoring are listed in the table below.

Sink / Faucet / Fountain #	1	2	3	4	5	6	7	8	9	10
LOCATION	LEAD RESULT (PARTS PER BILLION; ND = NOT-DETECTED)									
Classroom 17 Lab Sink Faucet (CF004)	10	3	3	3	2	2	2	2	2	2
Community Room Sink Faucet (CF012)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 7 Sink Faucet (CF023)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.027	Copper	0.14	DW013-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.015	Copper	0.13	DW013-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.008	Copper	0.09	DW013-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW013-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.038	Copper	0.10	DW021-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.027	Copper	0.00	DW021-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW021-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW021-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.008	Copper	0.00	CF023-RM #7	P1	First Primary draw of 125 milliliters
Lead	0.012	Copper	0.15	CF023-RM #7	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.06	CF023-RM #7	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF023-RM #7	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.016	Copper	0.08	DW014-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.003	Copper	0.00	DW014-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW014-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW014-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.016	Copper	0.18	KC019-RM #4	P1	First Primary draw of 125 milliliters
Lead	0.010	Copper	0.28	KC019-RM #4	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	KC019-RM #4	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC019-RM #4	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.033	Copper	0.16	DW020-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.015	Copper	0.12	DW020-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.020	Copper	0.00	DW020-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW020-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.012	Copper	0.14	DW002-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.08	DW002-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.00	DW002-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW002-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.011	Copper	0.20	CF022-RM #6	P1	First Primary draw of 125 milliliters
Lead	0.006	Copper	0.22	CF022-RM #6	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	CF022-RM #6	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.07	CF022-RM #6	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.009	Copper	0.07	CF006-RM 26	P1	First Primary draw of 125 milliliters
Lead	0.010	Copper	0.15	CF006-RM 26	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.16	CF006-RM 26	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF006-RM 26	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.056	Copper	0.21	CF004-RM 17	P1	First Primary draw of 125 milliliters
Lead	0.029	Copper	0.14	CF004-RM 17	P2	Second Primary draw of 125 milliliters
Lead	0.007	Copper	0.16	CF004-RM 17	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.003	Copper	0.17	CF004-RM 17	F02	Flush Sample taken 2 minutes after First Flush Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.

Results in RED exceed 15 ppb for lead or 1.3 ppm for Copper

1 ppb = 0.001 mg/L

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.011	Copper	0.14	KC016-RM-#1	P1	First Primary draw of 125 milliliters
Lead	0.003	Copper	0.14	KC016-RM-#1	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.05	KC016-RM-#1	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC016-RM-#1	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.013	Copper	0.18	KC017-RM-#2	P1	First Primary draw of 125 milliliters
Lead	0.008	Copper	0.18	KC017-RM-#2	P2	Second Primary draw of 125 milliliters
Lead	0.001	Copper	0.00	KC017-RM-#2	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC017-RM-#2	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.010	Copper	0.09	CF018-RM-#4	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.11	CF018-RM-#4	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	CF018-RM-#4	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF018-RM-#4	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.007	Copper	0.13	KC015-RM-#1	P1	First Primary draw of 125 milliliters
Lead	0.002	Copper	0.27	KC015-RM-#1	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	KC015-RM-#1	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.07	KC015-RM-#1	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.031	Copper	0.08	CF005-RM 17	P1	First Primary draw of 125 milliliters
Lead	0.006	Copper	0.07	CF005-RM 17	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.06	CF005-RM 17	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.06	CF005-RM 17	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.064	Copper	0.11	DW001-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.004	Copper	0.09	DW001-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.09	DW001-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	DW001-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.023	Copper	0.33	DW009-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.09	DW009-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.003	Copper	0.00	DW009-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW009-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.029	Copper	0.19	CF010-RM 27	P1	First Primary draw of 125 milliliters
Lead	0.034	Copper	0.16	CF010-RM 27	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	CF010-RM 27	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF010-RM 27	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.164	Copper	2.04	CF007-RM 26	P1	First Primary draw of 125 milliliters
Lead	0.166	Copper	1.78	CF007-RM 26	P2	Second Primary draw of 125 milliliters
Lead	0.015	Copper	0.78	CF007-RM 26	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.06	CF007-RM 26	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.007	Copper	0.14	CF003-RM 15	P1	First Primary draw of 125 milliliters
Lead	0.011	Copper	0.11	CF003-RM 15	P2	Second Primary draw of 125 milliliters
Lead	0.001	Copper	0.09	CF003-RM 15	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF003-RM 15	F02	Flush Sample taken 2 minutes after First Flush Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.

Results in RED exceed 15 ppt for lead or 1.3 ppm for Copper

1 ppb = 0.001 mg/L

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.000	Copper	0.06	CF012	P1	First Primary draw of 125 milliliters
Lead	0.014	Copper	0.13	CF012	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	CF012	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF012	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.001	Copper	0.56	DW001-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.016	Copper	0.57	DW001-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.39	DW001-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.06	DW001-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.006	Copper	0.42	DW005-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.011	Copper	0.10	DW005-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.00	DW005-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW005-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.010	Copper	0.17	CF004 - RM #17	C01	First Sequential Sample
Lead	0.003	Copper	0.17	CF004 - RM #17	C02	Second Sequential Sample
Lead	0.003	Copper	0.18	CF004 - RM #17	C03	Third Sequential Sample
Lead	0.001	Copper	0.19	CF004 - RM #17	C04	Fourth Sequential Sample
Lead	0.002	Copper	0.20	CF004 - RM #17	C05	Fifth Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	C06	Sixth Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	C07	Seventh Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	C08	Eighth Sequential Sample
Lead	0.002	Copper	0.16	CF004 - RM #17	C09	Ninth Sequential Sample
Lead	0.002	Copper	0.17	CF004 - RM #17	C10	Tenth Sequential Sample
Lead	0.002	Copper	0.00	CF012 -	CB1	First Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB2	Second Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB3	Third Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB4	Fourth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB5	Fifth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB6	Sixth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB7	Seventh Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB8	Eighth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB9	Ninth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB10	Tenth Sequential Sample
Lead	0.002	Copper	0.00	CF004	C01	First Sequential Sample
Lead	0.000	Copper	0.00	CF004	C02	Second Sequential Sample
Lead	0.001	Copper	0.00	CF004	C03	Third Sequential Sample
Lead	0.001	Copper	0.00	CF004	C04	Fourth Sequential Sample
Lead	0.000	Copper	0.00	CF004	C05	Fifth Sequential Sample
Lead	0.000	Copper	0.00	CF004	C06	Sixth Sequential Sample
Lead	0.000	Copper	0.00	CF004	C07	Seventh Sequential Sample
Lead	0.000	Copper	0.00	CF004	C08	Eighth Sequential Sample
Lead	0.001	Copper	0.00	CF004	C09	Ninth Sequential Sample
Lead	0.001	Copper	0.00	CF004	C10	Tenth Sequential Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.

Results in RED exceed 15 ppb for lead or 1.3 ppm for Copper

1 ppb = 0.001 mg/L

From: Sygo, Jim (DEQ)
Sent: Monday, December 21, 2015 5:18 PM
To: LeeWalters
Subject: Re: Questions About City Of Flint Water

I would direct any questions to either the Mayor or City Administrator.
DEQ would not recommend blending and to my knowledge it is not an activity regulated by the DEQ.

Sent from my iPhone

On Dec 21, 2015, at 5:11 PM, LeeWalters <lwalters313@gmail.com> wrote:

Mr. Sygo

In the previous email you stated MDEQ would not support blending the water. In media articles from 2013 Mayor Walling clearly states the blend has to be approved by the MDEQ.

So what role does the MDEQ play in regards to blending?

So who in the City of Flint would you recommend I ask these questions to?

Respectfully
LeeAnne Walters

On Dec 21, 2015 5:04 PM, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov> wrote:

LeeAnne Walters,

Following are the answers to your questions:

1. *What is the status of the pumps that are supposed to be installed for the orthophosphates?*

The orthophosphate feed system (pumps) was permitted by the DEQ on October 28, 2015. The feed pumps were installed in early December 2015 and placed into operation on December 9, 2015.

2. *Once the switch to the KWA happens, what will be the emergency water source for the City of Flint? Will it be Detroit or Flint River?*

Flint's emergency source of water after the switch to the KWA will be decided by the city of Flint. Please contact the city of Flint for further information regarding this issue.

3. *A few months back Howard Kroft confirmed a Y was installed at the water treatment to blend the untreated lake water with the Flint river water if needed. Will this still be happening/and or an option to happen?*

Use of Flint River for blending would be based on a decision made by the city of Flint. Please contact the city of Flint for further information regarding this issue.

4. *Why are the people not being made aware of the flushing and contacted before it happens. Why is there no notification from the city or the MDEQ?*

Notification of routine flushing is encouraged by the DEQ for all water utilities; however, it is the city's responsibility to provide adequate notification to residents in areas that will be affected by routine flushing. Please contact the city of Flint for further information regarding this issue.

Jim Sygo

Chief Deputy Director

Department of Environmental Quality

From: LeeWalters [mailto:lwalters313@gmail.com]
Sent: Wednesday, November 25, 2015 12:03 AM
To: Sygo, Jim (DEQ)
Subject: Questions About City Of Flint Water

Mr. Sygo

My name is LeeAnne Walters and I have a few questions about our water.

The first question what is the status of the pumps that are supposed to be installed for the ortho phosphates?

The second question is once the switch to the KWA happens, what will be the emergency water source for the City of Flint? Will it be Detroit or Flint River

Third question is a few months back Howard Croft confirmed a Y was installed at the water treatment plant to blend the untreated lake water with the Flint river water if needed. Will this still be happening/and or an option to happen.

I dont know if you are aware and I can provide pictures if you would like of the brown water that is coming out of people's taps because of the hydrant flushing. The city has been contacted multiple times and no answers have been given. Why are the people not being made aware of the flushing and contacted before it happens. Why is there no notification from the city or the MDEQ.

Respectfully
 LeeAnne Walters