

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, March 17, 2015 4:26 PM
To: Howard Croft; Brent Wright; Daugherty Johnson; Dayne Walling; donna. cole; gdn2@aol.com; James Henry; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Mike Lane; Natasha Henderson; Norb Birchmeier; Pete Levine; rob.nicholas@veolia.com; Robert Nicholas; rosejo@msu.edu; Russell Hudson; Samir Matta; Warren Green
Cc: Busch, Stephen (DEQ)
Subject: RE: TTHM Draft Letter
Attachments: Draft - Flint Letter to Healthcare Providers.docx

Howard,

I made a few changes to the draft letter...in red (see attached)....mainly to make a more clear distinction between the locational running annual average and the stand-alone quarter (February 2015) results and how it affects the number of sites in compliance. If you have any questions, feel free to call me.

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

From: Howard Croft [<mailto:hcroft@cityofflint.com>]
Sent: Monday, March 16, 2015 4:28 PM
To: Brent Wright; Daugherty Johnson; Dayne Walling; donna. cole; gdn2@aol.com; Howard Croft; James Henry; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; rob.nicholas@veolia.com; Robert Nicholas; rosejo@msu.edu; Russell Hudson; Samir Matta; Warren Green
Subject: TTHM Draft Letter

Team,

We have received our notice from the DEQ and our next step is to have this group preview the letter that we intend to send to the public along with it. I have forwarded everyone a draft of the letter for any comments and I am also sending again all of the literature that was forwarded from Mr. Wright of the EPA and DR. Rose of MSU.

We expect to have an additional FAQ ready and out to this group on Tuesday and we anticipate the violation notice going out in the near future.

The citizens advisory group will meet again on this Thursday, we are currently looking to have another **Technical Advisory Committee** with this group in early April.

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

DRAFT Letter to Flint Healthcare Providers

The safety and quality of Flint's water has been in the news for months. We have worked hard to address these issues and have succeeded in bringing Flint's water within the state's safety guidelines on all measures, including TTHM (total trihalomethanes). Excess TTHM triggered the initial letter to our customers earlier this year.

Even though Flint water now meets the standards and is testing significantly below the state's allowable contamination levels, we are required to send out another letter to residents because the *annual* quarterly testing average is not yet below the state's allowable average.

Flint tests for TTHM – a byproduct of the water chlorination process – at eight different sites in the city. When we began using the Flint River as a source in April of 2014, our first round of quarterly testing for TTHM was conducted in May. At that time, only two testing sites were below the allowable maximum; in August, every site was above the allowable maximum.

The City, with the help of LAN engineering, developed an Operation Evaluation Report (OER) which contained an action plan to address the issue. That plan was implemented with steps including upgrading the ozone treatment process at the Water Treatment Plant (WTP), **complete softening**, increasing water main/hydrant flushing to decrease stagnation, small scale testing of treatment to identify areas of improvement, applying overall improvements to the WTP through operational changes and to the distribution system through water circulation modeling

Because the public notice is based on a **locational running** annual average of quarterly results a notice was not required until November, at which time all but one testing **location** was below the allowable levels. **Our most recent testing in February 2015 showed all locations well below state allowable levels; however, the locational running annual average (based on the four most recent quarters – May 2014 – Feb. 2015) results in all but two locations being below the allowable level.** (See the attached graph outlining our progress.)

We have taken many steps to continue to improve the safety and quality of Flint's water, including bringing in international urban water system consultants, Veolia North America, and establishing two advisory committees: a Citizens Advisory Committee, along with a Technical Advisory Committee made up of representatives from the University of Michigan, Michigan State University, Kettering University, Mott Community College, Genesys, McLaren, and Hurley Hospitals along with local health officials including the Genesee Medical Society the Genesee County Public Health Department, the Michigan Department of Environmental Quality and the U.S. Environmental Protection Agency.

We have also established a hotline 810-787-6537 and a place for continuing updates on the city's website cityofflint.com and have encouraged residents who are concerned about their water to report it to us immediately so that we can make arrangements for on-site testing. Although we have been offering this for more than a month, to date only a few residents have requested on-site testing. All residents wishing to have their water tested can call the hotline number or send an email to flintwater@cityofflint.com.

Despite our progress, we are required by law to once again advise residents about what *was* an excess of TTHM in Flint's water system at the eight testing sights last year. The letter – a draft of which is enclosed for your information – includes legally required language recommending that residents who have (severely compromised immune systems, have an infant, or are elderly) should contact their physician. This is standard language from the U.S. EPA which is included in every water quality or water related report the City publishes, regardless of whether there are specific health or quality concerns, and is used by other municipalities nationwide. We failed to alert you in advance of our original letter we were required to send out earlier this year – and we don't want to make that mistake again. We have enclosed a fact sheet and a list of Frequently Asked Questions in an effort to help you respond to any inquiries you may get from patients.

We recognize that Flint's water system may still be challenged with *quality* issues such as discoloration or odor but we assure you the *safety* of the water meets all state standards. You should also know that the City also publishes its monthly tests for a wide variety of water treatment components, including chloride levels, on its website at cityofflint.com/?page_id=5643.

We urge you to contact the City of Flint Water Treatment Plant with any specific questions or concerns you may have on this issue. We will do our absolute best to get you the answers you need.

Sincerely,

Rennaker, Joanne (DEQ)

From: Arduin, Jim (DEQ)
Sent: Friday, February 07, 2014 9:34 AM
To: Robinson, Michael
Cc: Brim, Richard (DEQ); Craig, John (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Monosmith, Carrie (DEQ)
Subject: RE: update regarding Bray Road consent order
Attachments: city-of-flint-bray-road-co-2014-02-06b-draft.docx

Mike,

Attached a draft consent order related to the city of Flint Bray Road site pursuant to Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451. This is a rough draft based on the information available to the Office of Waste Management and Radiological Protection, but is a good starting point for development of the consent order. This draft has not been internally distributed for review and comment by DEQ staff, OWMRP and ODWMA management, or the Department of Attorney General, so it is subject to additional changes.

See you on Monday to discuss.

Jim

James Arduin
 Senior Geologist
 Michigan Department of Environmental Quality
 Office of Waste Management and Radiological Protection
 (517) 284-6652

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Thursday, February 06, 2014 10:42 AM
To: Busch, Stephen (DEQ)
Cc: Arduin, Jim (DEQ); Brim, Richard (DEQ); Craig, John (DEQ)
Subject: Re: update regarding Bray Road consent order

Great. I think we can make progress even without a " final" draft. Thanks

Sent from my iPhone

On Feb 6, 2014, at 7:25 AM, "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov> wrote:

I agree on Monday. It will be the only day next week I will be available to meet on this.

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

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Thursday, February 06, 2014 9:26 AM

To: Arduin, Jim (DEQ)

Cc: Busch, Stephen (DEQ); Brim, Richard (DEQ); Craig, John (DEQ)

Subject: Re: update regarding Bray Road consent order

We need to keep our meeting on Monday. Please send me what you have with the understanding that it still needs review within the DEQ. Can you also briefly identify any issues in an email to me today? We really must move things along. I appreciate your efforts. Thanks, mike

Sent from my iPhone

On Feb 6, 2014, at 4:11 AM, "Arduin, Jim (DEQ)" <ARDUINJ@michigan.gov> wrote:

Mike,

Due to the fact that this order significantly involves two divisions within the DEQ, it is taking longer to coordinate and incorporate internal comments and concerns. In addition, as I understand it, you have asked Steve Busch to add in additional stipulations/findings which are apparently going through appropriate staff review within the Drinking Water Division and have yet to work their way back to me for incorporation into the order. I honestly don't have a timeframe for you, as much of what is happening in this process is no longer in my control. I will forward the draft to you as soon as I can.

I will be out in the field all day today but will make the rounds around the office tomorrow to see where things stand. Even if we get you a copy tomorrow, it leaves you little time to prepare for Mondays meeting. We may need to reschedule.

Jim

James Arduin

Senior Geologist

Michigan Department of Environmental Quality

Office of Waste Management and Radiological Protection

(517) 284-6652

Please note the new phone number.

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]

Sent: Wednesday, February 05, 2014 11:35 PM

To: Arduin, Jim (DEQ)

Subject: RE: update regarding Bray Road consent order

Any chance you can send me a draft on Thursday?

From: Arduin, Jim (DEQ) [<mailto:ARDUINJ@michigan.gov>]

Sent: Monday, February 03, 2014 8:48 AM

To: Robinson, Michael

Cc: Busch, Stephen (DEQ)

Subject: update regarding Bray Road consent order

Mike,

We are still addressing several comments that were made during our review process.

I hope to get you a copy of the draft order later today.

Jim

James Arduin
Senior Geologist
Michigan Department of Environmental Quality
Office of Waste Management and Radiological Protection
(517) 284-6652

Please note the new phone number.

city-of-flint-bray-road-co-2014-02-06b-draft

Privileged and Confidential Settlement Communication

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STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF WASTE MANAGEMENT AND RADIOLOGICAL PROTECTION

In the matter of the
administrative proceedings against
City of Flint, doing business at
5200 Bray Road, Genesee Township,
Genesee County, Michigan

OWMRP Order No. 115- -14

CONSENT ORDER

This proceeding results from unresolved allegations specified in the Letters of Warning, (LOWs) issued on April 9, 2001, and February 14, 2002, by the Department of Environmental Quality ("DEQ"), Waste Management Division, and the Compliance Communication, dated January 18, 2011, issued by the DEQ, Environmental Resource Management Division, both now known as the DEQ, Office of Waste Management and Radiological Protection ("OWMRP") (Attachment 1). The DEQ alleges that the city of Flint ("Respondent") at 5200 Bray Road, Genesee Township, Genesee County, Michigan (the "Site"), placed or allowed the placement of solid waste in an open dump and/or abandoned solid waste in place of other disposal in violation of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Michigan Compiled Laws ("MCL") 324.101 *et seq.* ("NREPA"), and the administrative rules promulgated under Part 115. The Respondent and the DEQ agree to resolve the alleged violations set forth in the above-referenced LOWs and Compliance Communication by entry of this Consent Order.

STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of the Respondent and the DEQ are to address the open dump created at the Site, eliminate the surface water discharge from the Site to the Cornwell Drain, and allow the Respondent to reconstruct the system at the Site used to manage drinking water treatment plant (WTP) residuals.

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To accomplish these objectives, the Respondent will determine the areal extent and character of any solid waste historically disposed of at the Site, including, but not limited to, the WTP residuals and any solid wastes identified as being disposed of in the above-referenced LOWs and Compliance Communication. Consistent with the waste characterization and other investigation data, the Respondent will either remove and dispose of the waste at a disposal area that is permitted and licensed by the DEQ or, if acceptable, leave the solid waste in place and place final cover over it in accordance with the requirements of Part 115 and this Order. In addition, the Respondent will determine, by conducting a remedial investigation, whether any response activities must be taken to address contamination caused by the unauthorized disposal of solid waste at the Site.

Finally, if the Respondent proposes to reconstruct the system for the non-mechanical dewatering of its WTP residuals at the Site, then the Respondent will submit plans and specifications and secure from the DEQ, Office of Drinking Water and Municipal Assistance ("ODWMP"), a public water supply construction permit issued under Section 4 of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), MCL 325.1001 *et seq.*, and the administrative rules under Act 399 prior to initiating any construction, alteration, addition, or improvement to such system. A residuals management plan for the historical disposal of lime sludge and other WTP residuals, as well as lime sludge and any other WTP residuals generated in the future, must also be included as part of the construction permit application. The Respondent's proposal is based on its participation in the Karegnondi Water Authority (KWA) to receive source water from Lake Huron for its drinking water supply and the use of its water treatment plant to meet treatment requirements under Act 399. It will be approximately four years before the KWA infrastructure is built and water is available to the Respondent from KWA. The Respondent plans to use the Flint River as its source water supply until KWA water is fully available. Public improvement projects under Act 399 are required to be completed for Respondent to receive water from the KWA.

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I. DEFINITIONS

- 1.1 "Act 399" means the Safe Drinking Water Act, 1976 PA 399, as amended, MCL 325.1001 *et seq.*
- 1.2 "FAM" means the financial assurance mechanism acceptable to the DEQ to pay for monitoring, operation and maintenance, oversight, and other costs determined by the DEQ to be necessary to ensure the effectiveness and integrity of the remedial action. The FAM is a component of a Remedial Action Plan.
- 1.3 "NREPA" means the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*
- 1.4 "Open dump" means any area, place, or property where solid waste has been illegally disposed of or abandoned in place of other disposal.
- 1.5 "Part 115" means Part 115, Solid Waste Management, of the NREPA, MCL 324.11501 *et seq.*, and the Part 115 Administrative Rules.
- 1.6 "Part 115 Rules" means the administrative rules promulgated under Part 115.
- 1.7 "Part 201" means Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*, and the Part 201 Administrative Rules.
- 1.8 "Residuals Management Plan" means a DEQ-approved plan to remove both historical and future accumulations of lime sludge and other WTP residuals from the Site.
- 1.9 "Site" means the property located at 5200 Bray Road, Genesee Township, Genesee County, Michigan.

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- 1.10 "Solid Waste" as used in this Consent Order means "solid waste" as defined in Part 115 of the NREPA, MCL 324.11506(1), including any waste that has been disposed of at the Site, including lime sludge from WTP operations conducted by the Respondent.

II. STIPULATIONS

The Respondent and the DEQ stipulate as follows:

- 2.1 Pursuant to its authority under Part 115, the DEQ promulgated administrative rules necessary to implement Part 115. These rules are set forth in the 2005 *Annual Administrative Code Supplement* (AACS), R 299.4101 *et seq.* ("Part 115 Rules").
- 2.2 Pursuant to its authority under Act 399, the DEQ promulgated administrative rules necessary to implement Act 399. These rules set are set forth in the 2009 AACS, R 325.10101 *et seq.*
- 2.3 Pursuant to the NREPA and Executive Order No. 2011-1, the Director of the DEQ ("Director") is the state official and the DEQ is the state agency charged with the administration and enforcement of Part 115 and Act 399. This Consent Order is authorized under MCL 324.11519(2) and MCL 325.1022.
- 2.4 The Respondent is a "person" as defined by MCL 324.301(g) and MCL 325.1002(m).
- 2.5 The Respondent owns and operates the Site located at 5200 Bray Road, Genesee Township, Genesee County. The Respondent is a state of Michigan municipality.
- 2.6 The Site occupies approximately 76 acres of land adjacent to the Cornwell Drain on its northern boundary. The Cornwell Drain is a tributary to the Flint River. The Site consists of a WTP residuals storage area and contains various water level control structures and discharge points to the Cornwell Drain, and an area of where solid waste has been disposed in an open dump ("Open Dump"). Attachment 2 is an aerial

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schematic of the Site and shows the approximate boundaries of the WTP residuals storage area and the Open Dump.

- 2.7 The Respondent stipulates that the issuance and entry of this Consent Order is proper and acceptable. This Consent Order shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the OWMRP ("Office Chief"), designee of the Director, pursuant to MCL 324.301(b) of the NREPA.
- 2.8 The Respondent agrees to fully and strictly comply with all provisions of Part 115 and Act 399, the Part 115 Rules, the Act 399 Rules, and all other applicable state and federal statutes.
- 2.9 The Respondent and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Respondent of the allegations contained in the above-referenced LOWs and Compliance Communication or that the law has been violated.
- 2.10 The Respondent, all Respondent's successors and assigns, and the DEQ agree to and shall be bound by the requirements of this Consent Order.

III. COMPLIANCE PROGRAM

In order to resolve the violations alleged in the above-referenced LOWs and Compliance Communication, the Respondent shall achieve and maintain compliance with the requirements specified below in accordance with the following schedule:

- 3.1 On and after the effective date of this Consent Order, the Respondent shall ensure that the Site is secure and that, pursuant to R 299.4128(1), illegal dumping does not occur at the Site.
- 3.2 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall locate groundwater monitoring well MW-04. If MW-04 is found to be located within

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the footprint of the non-mechanical dewatering system identified in the construction plans referenced in Paragraph 3.4, MW-04 will be properly abandoned/removed within a mutually agreed upon schedule.

- 3.3 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall permanently cap the outlet tower identified in Attachment ____ and take all necessary actions to identify and terminate surface water discharges to the Cornwell Drain.
- 3.4 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the ODWMP for review and approval, an administratively complete Act 399 construction permit application for the reconstruction of the non-mechanical dewatering system for WTP residuals at the Site, including the physical barrier that will separate the WTP filter backwash, including lime sludge, from the other solid waste located on the Site. The permit application will clearly identify any areas that will not be used as part of the reconstructed non-mechanical dewatering system and identify any slurry inlet points located outside the system footprint so such inlet points can be permanently capped by the Respondent. The permit application will also include a basis of design for the management of solid WTP residuals within the system.
- 3.5 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the OWMRP for review and approval, any portion of the dewatering system residuals management plan submitted to the ODWMA that is required to comply with Part 115.
- 3.6 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a hydrogeologic monitoring plan ("Hydrogeologic Monitoring Plan") for the Open Dump that complies with R 299.4904, R 299.4905, R 299.4906, R 299.4907, and R 299.4908 of the Part 115 Rules. Upon approval by the DEQ, the Respondent shall implement the Hydrogeologic Monitoring Plan in accordance with the schedule contained therein.

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- 3.7 Within sixty (60) days after the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a remedial investigation work plan ("Remedial Investigation Work Plan") for the Open Dump. Upon approval by the DEQ, the Respondent shall implement the Remedial Investigation Work Plan in accordance with the schedule contained therein. If the Respondent believes that sufficient data already exists to define the environmental conditions at the Open Dump, then the Respondent can submit, in lieu of the Remedial Investigation Work Plan, the Remedial Investigation Report identified in Paragraph 3.8 of this Consent Order.
- 3.8 Within thirty (30) days of completing the remedial investigation, the Respondent shall submit to the DEQ for review and approval, the final results and conclusions of the remedial investigation, including all data, charts, maps, aquifer and soil cross-sections, contaminant concentration contours, diagrams, and other interpretive drawings, in the form of a written report ("Remedial Investigation Report").
- 3.9 If the Remedial Investigation Report fails to delineate the horizontal and vertical extent of the Open Dump or any contamination attributable to the Open Dump, the Respondent shall develop and implement a Phase II remedial investigation. If applicable, a complete and technically adequate work plan for a Phase II remedial investigation ("Phase II Remedial Investigation Work Plan") shall be submitted to the DEQ within sixty (60) days of the DEQ's notification that the Phase II Remedial Investigation Work Plan is necessary. Upon approval by the DEQ, the Respondent shall implement the Phase II Remedial Investigation Work Plan in accordance with the schedule contained therein. The Respondent shall submit final results and conclusions of the Phase II remedial investigation in the form of a written report within thirty (30) days of completion of the Phase II remedial investigation.
- 3.10 The Respondent shall submit to the DEQ, within ninety (90) days of written DEQ approval of the Remedial Investigation Report(s) required by Paragraphs 3.7 and 3.8, an assessment of corrective measures ("Assessment of Corrective Measures") that is in

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accordance with R 299.4443. The Assessment of Corrective Measures shall include an analysis of each potential remedy considered. In addition, the Assessment of Corrective Measures shall identify the final remedial action proposed by the Respondent and provide an explanation of how that action will meet applicable cleanup criteria of Part 201 and be in compliance with Part 115.

- 3.11 Within one hundred twenty (120) days of receipt of written approval of the Assessment of Corrective Measures from the DEQ, the Respondent shall submit to the DEQ for review and approval, a complete and technically adequate remedial action plan ("Remedial Action Plan") for the Open Dump that is in compliance with the requirements of R 299.4444. The Remedial Action Plan shall include a detailed schedule for implementation. The Remedial Action Plan shall be consistent with the results of the remedial investigation and any other monitoring data collected, reports submitted, and/or investigations conducted prior to submittal of the Remedial Action Plan. The Remedial Action Plan, when implemented, shall comply with the applicable cleanup criteria of Part 201 and, upon approval of the plan by the DEQ, the Respondent shall implement the approved Remedial Action Plan in accordance with the schedule contained therein.
- 3.12 If, in accordance with an approved Assessment of Corrective Measures, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the Remedial Action Plan, submit to the DEQ for review and approval, a capping and cell closure plan and schedule ("Capping and Cell Closure Plan") and a post closure plan ("Post Closure Plan") for the Open Dump that are in compliance with the requirements of R 299.4425, R 299.4447, respectively, and Part 115. Upon DEQ approval of the Capping and Cell Closure Plan and the Post Closure Plan, the Respondent shall implement the plans in accordance with the schedules contained therein. If the Respondent lacks the expertise and/or manpower to conduct the work in accordance with the DEQ-approved Capping and Cell Closure Plan, the Post Closure Plan, and the Part 115 Rules, the Respondent shall contract the work to be performed by a contractor experienced with landfill construction work.

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3.13 The Respondent shall provide financial assurance as required under Part 115.

IV. DEQ APPROVAL OF SUBMITTALS

- 4.1 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Consent Order to be submitted to the DEQ by the Respondent, the following process and terms of approval shall apply.
- 4.2 To be approved by the DEQ, any work plan, proposal, or other document required to be submitted by this Consent Order shall include all of the information required by the applicable statute and/or rule and all of the information required by the applicable paragraph(s) of this Consent Order.
- 4.3 Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Consent Order and shall be enforceable in accordance with the provisions of this Consent Order.
- 4.4 In the event the DEQ disapproves a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific reasons for such disapproval. The Respondent shall submit, within thirty (30) days of receipt of such disapproval, a revised work plan, proposal, or other document that adequately addresses the reasons for the DEQ's disapproval.
- 4.5 In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require the Respondent to submit, prior to implementation and within thirty (30) days of receipt

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of such approval with specific modifications, a revised work plan, proposal, or other document that adequately addresses such modifications.

- 4.6 A finding of approval or approval with modification of a submission shall not be construed to mean that the DEQ concurs with any of the conclusions, methods, or statements in the submission or warrants that the submission comports with law.
- 4.7 Failure by the Respondent to submit an approvable work plan, proposal, or other document within the applicable time period specified above shall subject the Respondent to the enforcement provisions of this Consent Order including, but not limited to, the stipulated penalty provisions commencing on the date the revised work plan, proposal, or other document was due and accumulating until an approvable work plan, proposal, or other document is submitted.
- 4.8 Any delays caused by the Respondent's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the Respondent's responsibility to comply with any other deadline(s) specified in this Consent Order.
- 4.9 No informal advice, guidance, suggestions, or comments by staff of the DEQ regarding reports, work plans, proposals, plans, specifications, schedules, or any other writing submitted by the Respondent will be construed as relieving the Respondent of its obligation to obtain written approval of the DEQ if and when required by this Consent Order.

V. MODIFICATIONS AND EXTENSIONS

- 5.1 At the request of the Respondent, a work plan, proposal, or other document approved or approved with specific modifications by the DEQ, with the exclusion of the specified deadlines set forth in Section II, Compliance Program, of this Consent Order, may be modified by the OWMRP District Supervisor ("District Supervisor").

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- 5.2 The Respondent and the DEQ agree that the Office Chief may, but in no circumstances is obligated to, grant the Respondent an extension of the specified deadlines set forth in this Consent Order. Any extension shall be preceded by a timely written request, received by the DEQ no later than ten (10) business days prior to the pertinent deadline, which shall include:
- a. An identification of the specific deadline(s) of this Consent Order that will not be met.
 - b. A detailed description of what will prevent the Respondent from meeting the deadline(s).
 - c. A description of the measures the Respondent has taken and/or intends to take to meet the required deadline(s).
 - d. The length of the extension requested and the specific date(s) on which the obligation(s) will be met.
- 5.3 The Office Chief shall respond promptly to such requests and shall not unreasonably withhold approval for such requests.
- 5.4 Any extension of the specified deadlines or other modifications and amendments of this Consent Order shall require a formal written amendment of this Consent Order, shall be signed by the Respondent and the DEQ ("Parties"), shall have as their effective date the date on which they are signed by the Office Chief, and shall be incorporated into and become an enforceable part of this Consent Order.

VI. REPORTING

- 6.1 The Respondent shall submit all items required in Section II, Compliance Program, to the Lansing District Supervisor, OWMRP, DEQ, P.O Box 30241 Lansing, Michigan

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48909-7742, unless specifically directed otherwise within this Consent Order. The cover letter with each submittal shall identify the specific paragraph and requirement of this Consent Order that the submittal is intended to satisfy. If the address of the District Supervisor changes, the Respondent will be notified and shall make all subsequent submittals to any new address of which they are notified.

- 6.2 The Respondent shall verbally report any violation(s) of the terms and conditions of this Consent Order to the District Supervisor by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with a written report within five (5) business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), the precise cause or causes of the violation(s), a detailed description of any action(s) taken or proposed to correct the violation(s), and a schedule for the implementation of any proposed corrective action(s). The Respondent shall report any anticipated violation(s) of this Consent Order to the District Supervisor in advance of the relevant deadlines, whenever possible.

VII. RETENTION OF RECORDS

- 7.1 Upon request by an authorized representative of the DEQ, the Respondent shall make available to the DEQ all records, plans, logs, and other documents required to be maintained under this Consent Order, or pursuant to Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules. All such documents shall be retained at the Disposal Area for at least a period of three (3) years from the date of generation of the record unless a longer period of record retention is required by Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules.

VIII. RIGHT OF ENTRY

- 8.2 The Respondent shall allow any authorized representative or contractor of the DEQ, upon presentation of proper credentials, to enter upon the premises of the Site at all

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reasonable times for the purpose of monitoring compliance with the provisions of this Consent Order. This paragraph in no way limits the authority of the DEQ to conduct tests and inspections pursuant to the NREPA and its rules or any other applicable statutory provision.

IX. FINES, COSTS, AND PENALTIES

- 9.1 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall pay the sum of \${_____} to the State of Michigan in settlement of the DEQ's claim for civil fines arising from the violations alleged in the above-referenced LOWs and Compliance Communication.
- 9.2 For each failure to comply with the provisions of Section II, Compliance Program, of this Consent Order, the Respondent shall pay to the State of Michigan stipulated penalties in an amount of \$250 per violation per day for one (1) through seven (7) days of violation; \$500 per violation per day for eight (8) through fourteen (14) days of violation; and \$750 per violation per day for each day of violation thereafter. Stipulated penalties shall be paid within thirty (30) days after receiving a written demand made by the DEQ.
- 9.3 To ensure timely payment of any civil fines, penalties, and costs due under this Consent Order, the Respondent shall pay an interest penalty to the State of Michigan each time the Respondent fails to make a complete or timely payment. This interest penalty shall be based on the rate set forth at Section 6013(6) of the Revised Judicature Act, 1961 PA 236, as amended, MCL 600.6013(6), using the full increment of amount due as principal, and calculated from the due date for the payment until the delinquent payment is finally made in full.
- 9.4 The Respondent shall make all payments due under this Consent Order by certified or cashier's check made payable to the "State of Michigan" and mailed to the DEQ, Revenue Control Unit, P.O. Box 30657, Lansing, Michigan 48909-8157, or hand

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delivered to the DEQ, Revenue Control Unit, 1st Floor, Van Wagoner Building, 425 West Ottawa Street, Lansing, Michigan 48933. To ensure proper credit, all payments made pursuant to this Consent Order must include Payment Identification Number OWMRP_____ on the front of the check and/or in the cover letter with the payment.

- 9.5 The Respondent agrees not to contest the legality of the civil fine or the costs of surveillance and enforcement paid pursuant to this section. The Respondent further agrees not to contest the legality of any stipulated penalties or interest penalties assessed pursuant to this section but reserves the right to dispute the factual basis upon which a demand by the DEQ for stipulated penalties or interest penalties is made.
- 9.6 Liability for or payment of stipulated penalties pursuant to this Consent Order shall not preclude the State of Michigan from seeking injunctive relief or other relief for the Respondent's failure to comply with the requirements of this Consent Order and/or any permit(s) or license(s) required to comply with this Consent Order.

- X. **DISPUTE RESOLUTION** 10.1 Unless otherwise provided in this Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order. However, the procedures set forth in this section shall not apply to actions by the state of Michigan to enforce obligations of the Respondent that have not been disputed in accordance with this section. Engagement of a dispute resolution between the Parties shall not be cause for the Respondent to delay the performance of any compliance requirements or response activity. Any dispute that arises under this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The period of negotiations shall not exceed twenty (20) days from the date of written notice by any Party that a dispute has arisen, unless the time period for negotiations is modified by written agreement between the Parties. The dispute shall be considered to have arisen when one Party sends the other Party a written notice of dispute. If agreement cannot be reached on any issue within this twenty-

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(20-) day period, the DEQ shall provide a written statement of its decision to the Respondent and, in the absence of initiation of formal dispute resolution by the Respondent under Paragraph 10.3, the DEQ position, as outlined in its written statement of decision, shall be binding on the Parties.

10.2 If the Respondent and DEQ cannot informally resolve a dispute under Paragraph 9.1, the Respondent may initiate formal dispute resolution by requesting a review of the disputed issues by the Office Chief. This written request must be filed with the Office Chief within fifteen (15) days of the Respondent's receipt of the DEQ's statement of decision that is issued at the conclusion of the informal dispute resolution procedure set forth in Paragraph 9.1. The Respondent's request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation upon which the Respondent bases its position. Within fourteen (14) days of the Office Chief's receipt of the Respondent's request for a review of disputed issues, the Office Chief will provide a written statement of decision to the Respondent, which will include a statement of his/her understanding of the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting her/his position; and all supporting documentation relied upon by the Office Chief's review of the disputed issues. The Office Chief's review of the disputed issues may be extended by written agreement of the Parties.

10.3 The written statement of the Office Chief issued under Paragraph 10.3 shall be binding on the Parties unless, within fifteen (15) days after receipt of the DEQ's written statement of decision, the Respondent files a petition for judicial review in a court of competent jurisdiction that shall set forth a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Order. Nothing in this Consent Order affects the limitations on the timing of judicial review of the DEQ decision regarding the selection, extent, or adequacy of any response activity as provided for in Part 201.

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- 10.4 An administrative record of the dispute shall be maintained by the DEQ. The administrative record shall include all of the information provided by the Respondent pursuant to Paragraph 9.3, as well as any other documents relied upon by the DEQ in making its final decision pursuant to Paragraph 10.3. Where appropriate, the DEQ shall allow submission of supplemental statements of position by the Parties to the dispute.
- 10.5 In proceeding on any dispute, the Respondent shall have the burden of demonstrating on the administrative record that the position of the DEQ is arbitrary and capricious or otherwise not in accordance with law. In proceedings on any dispute initiated by the Respondent, the Respondent shall bear the burden of persuasion on factual issues.
- 10.6 Notwithstanding the invocation of dispute resolution proceedings, stipulated penalties shall accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Order, but payment shall be stayed pending resolution of the dispute. Stipulated penalties shall be paid within thirty (30) days after the resolution of the dispute. The Respondent shall pay that portion of a demand for payment of stipulated penalties that is not subject to dispute resolution procedures in accordance with and in the manner provided in Section IX, Fines, Costs, and Penalties.

XI. FORCE MAJEURE

- 11.1 The Respondent shall perform the requirements of this Consent Order within the time limits established herein unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the Respondent's obligations under this Consent Order in accordance with this section.
- 11.2 For the purpose of this Consent Order, "Force Majeure" means an occurrence or nonoccurrence arising from causes not foreseeable, beyond the control of, and without the fault of the Respondent, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the

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Respondent's diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the Respondent's actions or omissions.

- 11.3 The Respondent shall notify the DEQ, by telephone, within forty-eight (48) hours of discovering any event that causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or causes of delay, the measures taken by the Respondent to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay.
- 11.4 Failure of the Respondent to comply with the notice requirements of Paragraph 10.3, above, shall render this section void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of Paragraph 10.3.
- 11.5 If the Parties to this Consent Order agree that the delay or anticipated delay was beyond the control of the Respondent, this may be so stipulated and the parties to this Consent Order may agree upon an appropriate modification of this Consent Order. If the Parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X, Dispute Resolution, of this Consent Order. The burden of proving that any delay was beyond the reasonable control of the Respondent, and that all the requirements of this section have been met by the Respondent, is on the Respondent.
- 11.6 An extension of any given compliance date based upon a particular incident does not necessarily mean that the Respondent qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

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XII. GENERAL PROVISIONS

- 12.1 With respect to any violations not specifically addressed and resolved by this Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the Respondent to comply with the requirements of any state or federal law, including the NREPA and its rules.
- 12.2 Execution of the schedule contained in this Consent Order shall not be construed to waive, estop, or otherwise diminish the DEQ's right to seek or impose civil liability upon, and seek appropriate relief from, the Respondent for degradation of waters of the State and the designated uses thereof arising out of the failure of the Respondent to achieve a proper cleanup pursuant to this Consent Order.
- 12.3 This Consent Order does not constitute a warranty or representation of any kind by the DEQ that the response activities performed in accordance with this Consent Order or DEQ-approved work plans will result in the achievement of the remedial criteria established by law, or that the response activities will ensure protection of public health, safety, or the environment.
- 12.4 This Consent Order in no way affects the Respondent's responsibility to comply with any other applicable state, federal, or local laws or regulations including, without limitation, any corrective action or similar requirements applicable to the Site pursuant to the NREPA and its rules.
- 12.5 Nothing in this Consent Order is or shall be considered to affect any liability the Respondent may have for natural resources damages caused by the Respondent's ownership and/or operation of the Site. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.
- 12.6 The Parties agree that the terms and conditions of this Consent Order will be enforceable in circuit court. The Parties further agree that the appropriate venue for the enforcement

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of this Consent Order shall be the Circuit Court for Genesee County or Ingham County, State of Michigan, which courts shall also be appropriate for dispute resolution.

- 12.7 If any provision or authority of this Consent Order or the application of this Consent Order to any Party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other Parties or circumstances and the remainder of the Consent Order shall remain in force and shall not be affected thereby.
- 12.8 The provisions of this Consent Order shall be binding on the Respondent, the DEQ, and their successors and assigns. The Respondent shall give notice of this Consent Order to any prospective successor in interest prior to transfer of ownership of the Site property or any portion thereof and shall notify the DEQ of such proposed sale or transfer.

XIII. TERMINATION

- 13.1 This Consent Order shall remain in full force and effect until expressly terminated by a written Notice of Termination issued by the Office Chief. The Respondent may request that the Office Chief issue a written Notice of Termination at any time after achieving full compliance with this Consent Order. Such a request shall consist of a written certification that the Respondent has fully complied with all of the requirements of this Consent Order and has made payment of any fines, penalties, and costs required under this Consent Order. Specifically, this certification shall include:
- a. The date of compliance with each provision of the compliance program in Section II of this Consent Order and the date any fines, penalties, or costs were paid;
 - b. a statement that all required information has been reported to the District Supervisor;

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- c. confirmation that all records required to be maintained pursuant to this Consent Order are being maintained by the City; and
- d. additional relevant information requested by the Office Chief.

13.2 The Office Chief shall issue a written Notice of Termination unless the DEQ determines that the Respondent has not submitted the certification required under this section, has failed to submit the information specifically requested by the Office Chief, or has failed to comply with, or complete, all of the requirements of this Consent Order.

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XIII. SIGNATORIES

The undersigned CERTIFY they are fully authorized by the party they represent to enter into this Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it.

{OWNER/OPERATOR'S FULL LEGAL NAME}**DEPARTMENT OF ENVIRONMENTAL
QUALITY**

By: _____

Dan Wyant
Director

Name: _____

Title: _____

By: _____

Date: _____

Elizabeth M. Browne, Chief
Office of Waste Management and
Radiological Protection

Date: _____

APPROVED AS TO FORM:Bill Schuette
Attorney General**{INSERT NAME OF AAG ASSIGNED} {P_____}**Assistant Attorney General
Environment, Natural Resources, and
Agriculture Division
Department of Attorney General
Constitution Hall, 5th Floor, South Tower
525 West Allegan Street
Lansing, Michigan 48933

Date: _____

Rennaker, Joanne (DEQ)

From: Craig, John (DEQ)
Sent: Thursday, February 06, 2014 4:06 PM
To: Busch, Stephen (DEQ); Arduin, Jim (DEQ); Brim, Richard (DEQ)
Subject: RE: update regarding Bray Road consent order
Attachments: city-of-flint-bray-road-co-2014-02-06b-draft.docx

Steve, I have integrated the City's proposed language into the last paragraph of the Statement of Purpose. Attached is a revise draft. However, I am uncertain as to the meaning of the City's last sentence which states: "Public improvement projects under Act 399 are required to be completed for [Respondent] to receive water from the KWA." What do they mean by "public improvement projects" and what "requires" such to be completed.

I would prefer language that says: The KWA requires the Respondent's waterworks system to be in full compliance with Act 399 before KWA delivers source water to the Respondent." This seems to be more straightforward to me. Hopefully, this is what the City is getting at. You'll have to discuss this issue with the City.

John Craig, Chief,
 Enforcement Section* | Office of Waste Management and Radiological Protection | Department of Environmental Quality | Constitution Hall – Lansing
 ☎ Phone: 517-284-6546 | 📠 Facsimile 517-373-4797

** Supporting the Office of Drinking Water and Municipal Assistance | Office of Oil, Gas, and Minerals | Office of Waste Management and Radiological Protection*

From: Busch, Stephen (DEQ)
Sent: Thursday, February 06, 2014 3:35 PM
To: Craig, John (DEQ); Arduin, Jim (DEQ); Brim, Richard (DEQ)
Subject: RE: update regarding Bray Road consent order

Thanks John.

I believe the City will want to add the attached language or something similar as a new paragraph/subsection under the findings (Section 2). If we could add it now to the draft that would be helpful, but we can try to negotiate it on Monday if necessary.

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

From: Craig, John (DEQ)
Sent: Thursday, February 06, 2014 2:42 PM
To: Busch, Stephen (DEQ); Arduin, Jim (DEQ); Brim, Richard (DEQ)
Subject: FW: update regarding Bray Road consent order
Importance: High

Steve and Jim, I have attached a draft consent order related to the city of Flint Bray Road site pursuant to Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451. This is a rough draft based on the information available to the Office of Waste Management and Radiological Protection, but is a good starting point for development of the consent order. This draft has not been internally distributed for review and comment by

DEQ staff, OWMRP and ODWMA management, or the Department of Attorney General, so it is subject to additional changes. However, in the interest in moving the project along, you may share it with the City and their representatives, with the above caveat, in order to continue what I hope will be fruitful discussions next Monday.

Unfortunately, I will be out of the office tomorrow, Friday, February 7th, so I will not be available to discuss my revisions or respond to questions you may have. I'll be back in the office on Monday at 10:00 AM. Thanks. John

John Craig, Chief,
Enforcement Section* | Office of Waste Management and Radiological Protection | Department of Environmental Quality | Constitution Hall --
Lansing
☎ Phone: 517-284-6546 | 📠 Facsimile 517-373-4797

** Supporting the Office of Drinking Water and Municipal Assistance | Office of Oil, Gas, and Minerals | Office of Waste Management and Radiological Protection*

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Thursday, February 06, 2014 10:42 AM
To: Busch, Stephen (DEQ)
Cc: Arduin, Jim (DEQ); Brim, Richard (DEQ); Craig, John (DEQ)
Subject: Re: update regarding Bray Road consent order

Great. I think we can make progress even without a "final" draft. Thanks

Sent from my iPhone

On Feb 6, 2014, at 7:25 AM, "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov> wrote:

I agree on Monday. It will be the only day next week I will be available to meet on this.

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

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Thursday, February 06, 2014 9:26 AM
To: Arduin, Jim (DEQ)
Cc: Busch, Stephen (DEQ); Brim, Richard (DEQ); Craig, John (DEQ)
Subject: Re: update regarding Bray Road consent order

We need to keep our meeting on Monday. Please send me what you have with the understanding that it still needs review within the DEQ. Can you also briefly identify any issues in an email to me today? We really must move things along. I appreciate your efforts. Thanks, mike

Sent from my iPhone

On Feb 6, 2014, at 4:11 AM, "Arduin, Jim (DEQ)" <ARDUINJ@michigan.gov> wrote:

Mike,

Due to the fact that this order significantly involves two divisions within the DEQ, it is taking longer to coordinate and incorporate internal comments and concerns. In addition, as I understand it, you have asked Steve Busch to add in additional stipulations/findings which are apparently going through appropriate staff review within

the Drinking Water Division and have yet to work their way back to me for incorporation into the order. I honestly don't have a timeframe for you, as much of what is happening in this process is no longer in my control. I will forward the draft to you as soon as I can.

I will be out in the field all day today but will make the rounds around the office tomorrow to see where things stand. Even if we get you a copy tomorrow, it leaves you little time to prepare for Mondays meeting. We may need to reschedule.

Jim

James Arduin
Senior Geologist
Michigan Department of Environmental Quality
Office of Waste Management and Radiological Protection
(517) 284-6652

Please note the new phone number.

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Wednesday, February 05, 2014 11:35 PM
To: Arduin, Jim (DEQ)
Subject: RE: update regarding Bray Road consent order

Any chance you can send me a draft on Thursday?

From: Arduin, Jim (DEQ) [<mailto:ARDUINJ@michigan.gov>]
Sent: Monday, February 03, 2014 8:48 AM
To: Robinson, Michael
Cc: Busch, Stephen (DEQ)
Subject: update regarding Bray Road consent order

Mike,

We are still addressing several comments that were made during our review process.

I hope to get you a copy of the draft order later today.

Jim

James Arduin
Senior Geologist
Michigan Department of Environmental Quality
Office of Waste Management and Radiological Protection
(517) 284-6652

Please note the new phone number.

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STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF WASTE MANAGEMENT AND RADIOLOGICAL PROTECTION

In the matter of the
administrative proceedings against
City of Flint, doing business at
5200 Bray Road, Genesee Township,
Genesee County, Michigan

OWMRP Order No. 115- -14

CONSENT ORDER

This proceeding results from unresolved allegations specified in the Letters of Warning, (LOWs) issued on April 9, 2001, and February 14, 2002, by the Department of Environmental Quality ("DEQ"), Waste Management Division, and the Compliance Communication, dated January 18, 2011, issued by the DEQ, Environmental Resource Management Division, both now known as the DEQ, Office of Waste Management and Radiological Protection ("OWMRP") (Attachment 1). The DEQ alleges that the city of Flint ("Respondent") at 5200 Bray Road, Genesee Township, Genesee County, Michigan (the "Site"), placed or allowed the placement of solid waste in an open dump and/or abandoned solid waste in place of other disposal in violation of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Michigan Compiled Laws ("MCL") 324.101 *et seq.* ("NREPA"), and the administrative rules promulgated under Part 115. The Respondent and the DEQ agree to resolve the alleged violations set forth in the above-referenced LOWs and Compliance Communication by entry of this Consent Order.

STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of the Respondent and the DEQ are to address the open dump created at the Site, eliminate the surface water discharge from the Site to the Cornwell Drain, and allow the Respondent to reconstruct the system at the Site used to manage drinking water treatment plant (WTP) residuals.

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To accomplish these objectives, the Respondent will determine the areal extent and character of any solid waste historically disposed of at the Site, including, but not limited to, the WTP residuals and any solid wastes identified as being disposed of in the above-referenced LOWs and Compliance Communication. Consistent with the waste characterization and other investigation data, the Respondent will either remove and dispose of the waste at a disposal area that is permitted and licensed by the DEQ or, if acceptable, leave the solid waste in place and place final cover over it in accordance with the requirements of Part 115 and this Order. In addition, the Respondent will determine, by conducting a remedial investigation, whether any response activities must be taken to address contamination caused by the unauthorized disposal of solid waste at the Site.

Finally, if the Respondent proposes to reconstruct the system for the non-mechanical dewatering of its WTP residuals at the Site, then the Respondent will submit plans and specifications and secure from the DEQ, Office of Drinking Water and Municipal Assistance ("ODWMP"), a public water supply construction permit issued under Section 4 of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), MCL 325.1001 *et seq.*, and the administrative rules under Act 399 prior to initiating any construction, alteration, addition, or improvement to such system. A residuals management plan for the historical disposal of lime sludge and other WTP residuals, as well as lime sludge and any other WTP residuals generated in the future, must also be included as part of the construction permit application. The Respondent's proposal is based on its participation in the Karegnondi Water Authority (KWA) to receive source water from Lake Huron for its drinking water supply and the use of its water treatment plant to meet treatment requirements under Act 399. It will be approximately four years before the KWA infrastructure is built and water is available to the Respondent from KWA. The Respondent plans to use the Flint River as its source water supply until KWA water is fully available. Public improvement projects under Act 399 are required to be completed for Respondent to receive water from the KWA.

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I. DEFINITIONS

- 1.1 "Act 399" means the Safe Drinking Water Act, 1976 PA 399, as amended, MCL 325.1001 *et seq.*
- 1.2 "FAM" means the financial assurance mechanism acceptable to the DEQ to pay for monitoring, operation and maintenance, oversight, and other costs determined by the DEQ to be necessary to ensure the effectiveness and integrity of the remedial action. The FAM is a component of a Remedial Action Plan.
- 1.3 "NREPA" means the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*
- 1.4 "Open dump" means any area, place, or property where solid waste has been illegally disposed of or abandoned in place of other disposal.
- 1.5 "Part 115" means Part 115, Solid Waste Management, of the NREPA, MCL 324.11501 *et seq.*, and the Part 115 Administrative Rules.
- 1.6 "Part 115 Rules" means the administrative rules promulgated under Part 115.
- 1.7 "Part 201" means Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*, and the Part 201 Administrative Rules.
- 1.8 "Residuals Management Plan" means a DEQ-approved plan to remove both historical and future accumulations of lime sludge and other WTP residuals from the Site.
- 1.9 "Site" means the property located at 5200 Bray Road, Genesee Township, Genesee County, Michigan.

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- 1.10 "Solid Waste" as used in this Consent Order means "solid waste" as defined in Part 115 of the NREPA, MCL 324.11506(1), including any waste that has been disposed of at the Site, including lime sludge from WTP operations conducted by the Respondent.

II. STIPULATIONS

The Respondent and the DEQ stipulate as follows:

- 2.1 Pursuant to its authority under Part 115, the DEQ promulgated administrative rules necessary to implement Part 115. These rules are set forth in the 2005 *Annual Administrative Code Supplement* (AACS), R 299.4101 *et seq.* ("Part 115 Rules").
- 2.2 Pursuant to its authority under Act 399, the DEQ promulgated administrative rules necessary to implement Act 399. These rules set are set forth in the 2009 AACS, R 325.10101 *et seq.*
- 2.3 Pursuant to the NREPA and Executive Order No. 2011-1, the Director of the DEQ ("Director") is the state official and the DEQ is the state agency charged with the administration and enforcement of Part 115 and Act 399. This Consent Order is authorized under MCL 324.11519(2) and MCL 325.1022.
- 2.4 The Respondent is a "person" as defined by MCL 324.301(g) and MCL 325.1002(m).
- 2.5 The Respondent owns and operates the Site located at 5200 Bray Road, Genesee Township, Genesee County. The Respondent is a state of Michigan municipality.
- 2.6 The Site occupies approximately 76 acres of land adjacent to the Cornwell Drain on its northern boundary. The Cornwell Drain is a tributary to the Flint River. The Site consists of a WTP residuals storage area and contains various water level control structures and discharge points to the Cornwell Drain, and an area of where solid waste has been disposed in an open dump ("Open Dump"). Attachment 2 is an aerial

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schematic of the Site and shows the approximate boundaries of the WTP residuals storage area and the Open Dump.

- 2.7 The Respondent stipulates that the issuance and entry of this Consent Order is proper and acceptable. This Consent Order shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the OWMRP ("Office Chief"), designee of the Director, pursuant to MCL 324.301(b) of the NREPA.
- 2.8 The Respondent agrees to fully and strictly comply with all provisions of Part 115 and Act 399, the Part 115 Rules, the Act 399 Rules, and all other applicable state and federal statutes.
- 2.9 The Respondent and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Respondent of the allegations contained in the above-referenced LOWs and Compliance Communication or that the law has been violated.
- 2.10 The Respondent, all Respondent's successors and assigns, and the DEQ agree to and shall be bound by the requirements of this Consent Order.

III. COMPLIANCE PROGRAM

In order to resolve the violations alleged in the above-referenced LOWs and Compliance Communication, the Respondent shall achieve and maintain compliance with the requirements specified below in accordance with the following schedule:

- 3.1 On and after the effective date of this Consent Order, the Respondent shall ensure that the Site is secure and that, pursuant to R 299.4128(1), illegal dumping does not occur at the Site.
- 3.2 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall locate groundwater monitoring well MW-04. If MW-04 is found to be located within

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the footprint of the non-mechanical dewatering system identified in the construction plans referenced in Paragraph 3.4, MW-04 will be properly abandoned/removed within a mutually agreed upon schedule.

- 3.3 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall permanently cap the outlet tower identified in Attachment ____ and take all necessary actions to identify and terminate surface water discharges to the Cornwell Drain.
- 3.4 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the ODWMP for review and approval, an administratively complete Act 399 construction permit application for the reconstruction of the non-mechanical dewatering system for WTP residuals at the Site, including the physical barrier that will separate the WTP filter backwash, including lime sludge, from the other solid waste located on the Site. The permit application will clearly identify any areas that will not be used as part of the reconstructed non-mechanical dewatering system and identify any slurry inlet points located outside the system footprint so such inlet points can be permanently capped by the Respondent. The permit application will also include a basis of design for the management of solid WTP residuals within the system.
- 3.5 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the OWMRP for review and approval, any portion of the dewatering system residuals management plan submitted to the ODWMA that is required to comply with Part 115.
- 3.6 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a hydrogeologic monitoring plan ("Hydrogeologic Monitoring Plan") for the Open Dump that complies with R 299.4904, R 299.4905, R 299.4906, R 299.4907, and R 299.4908 of the Part 115 Rules. Upon approval by the DEQ, the Respondent shall implement the Hydrogeologic Monitoring Plan in accordance with the schedule contained therein.

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- 3.7 Within sixty (60) days after the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a remedial investigation work plan ("Remedial Investigation Work Plan") for the Open Dump. Upon approval by the DEQ, the Respondent shall implement the Remedial Investigation Work Plan in accordance with the schedule contained therein. If the Respondent believes that sufficient data already exists to define the environmental conditions at the Open Dump, then the Respondent can submit, in lieu of the Remedial Investigation Work Plan, the Remedial Investigation Report identified in Paragraph 3.8 of this Consent Order.
- 3.8 Within thirty (30) days of completing the remedial investigation, the Respondent shall submit to the DEQ for review and approval, the final results and conclusions of the remedial investigation, including all data, charts, maps, aquifer and soil cross-sections, contaminant concentration contours, diagrams, and other interpretive drawings, in the form of a written report ("Remedial Investigation Report").
- 3.9 If the Remedial Investigation Report fails to delineate the horizontal and vertical extent of the Open Dump or any contamination attributable to the Open Dump, the Respondent shall develop and implement a Phase II remedial investigation. If applicable, a complete and technically adequate work plan for a Phase II remedial investigation ("Phase II Remedial Investigation Work Plan") shall be submitted to the DEQ within sixty (60) days of the DEQ's notification that the Phase II Remedial Investigation Work Plan is necessary. Upon approval by the DEQ, the Respondent shall implement the Phase II Remedial Investigation Work Plan in accordance with the schedule contained therein. The Respondent shall submit final results and conclusions of the Phase II remedial investigation in the form of a written report within thirty (30) days of completion of the Phase II remedial investigation.
- 3.10 If the remedial investigation verifies and/or reveals contamination above criteria established pursuant to Part 201, the Respondent shall submit to the DEQ, within ninety (90) days of written DEQ approval of the Remedial Investigation Report(s) required by

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Paragraphs 3.7 and 3.8, an assessment of corrective measures ("Assessment of Corrective Measures") that is in accordance with R 299.4443. The Assessment of Corrective Measures shall include an analysis of each potential remedy considered. In addition, the Assessment of Corrective Measures shall identify the final remedial action proposed by the Respondent and provide an explanation of how that action will meet applicable cleanup criteria of Part 201 and be in compliance with Part 115.

- 3.11 Within one hundred twenty (120) days of receipt of written approval of the Assessment of Corrective Measures from the DEQ, the Respondent shall submit to the DEQ for review and approval, a complete and technically adequate remedial action plan ("Remedial Action Plan") for the Open Dump that is in compliance with the requirements of R 299.4444. The Remedial Action Plan shall include a detailed schedule for implementation. The Remedial Action Plan shall be consistent with the results of the remedial investigation and any other monitoring data collected, reports submitted, and/or investigations conducted prior to submittal of the Remedial Action Plan. The Remedial Action Plan, when implemented, shall comply with the applicable cleanup criteria of Part 201 and, upon approval of the plan by the DEQ, the Respondent shall implement the approved Remedial Action Plan in accordance with the schedule contained therein.
- 3.12 If, in accordance with an approved Assessment of Corrective Measures, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the Remedial Action Plan, submit to the DEQ for review and approval, a capping and cell closure plan and schedule ("Capping and Cell Closure Plan") and a post closure plan ("Post Closure Plan") for the Open Dump that are in compliance with the requirements of R 299.4425, R 299.4447, respectively, and Part 115. Upon DEQ approval of the Capping and Cell Closure Plan and the Post Closure Plan, the Respondent shall implement the plans in accordance with the schedules contained therein. If the Respondent lacks the expertise and/or manpower to conduct the work in accordance with the DEQ-approved Capping and Cell Closure Plan,

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the Post Closure Plan, and the Part 115 Rules, the Respondent shall contract the work to be performed by a contractor experienced with landfill construction work.

- 3.13 The Respondent shall provide financial assurance as required under Part 115.

IV. DEQ APPROVAL OF SUBMITTALS

- 4.1 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Consent Order to be submitted to the DEQ by the Respondent, the following process and terms of approval shall apply.
- 4.2 To be approved by the DEQ, any work plan, proposal, or other document required to be submitted by this Consent Order shall include all of the information required by the applicable statute and/or rule and all of the information required by the applicable paragraph(s) of this Consent Order.
- 4.3 Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Consent Order and shall be enforceable in accordance with the provisions of this Consent Order.
- 4.4 In the event the DEQ disapproves a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific reasons for such disapproval. The Respondent shall submit, within thirty (30) days of receipt of such disapproval, a revised work plan, proposal, or other document that adequately addresses the reasons for the DEQ's disapproval.
- 4.5 In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require

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the Respondent to submit, prior to implementation and within thirty (30) days of receipt of such approval with specific modifications, a revised work plan, proposal, or other document that adequately addresses such modifications.

- 4.6 A finding of approval or approval with modification of a submission shall not be construed to mean that the DEQ concurs with any of the conclusions, methods, or statements in the submission or warrants that the submission comports with law.
- 4.7 Failure by the Respondent to submit an approvable work plan, proposal, or other document within the applicable time period specified above shall subject the Respondent to the enforcement provisions of this Consent Order including, but not limited to, the stipulated penalty provisions commencing on the date the revised work plan, proposal, or other document was due and accumulating until an approvable work plan, proposal, or other document is submitted.
- 4.8 Any delays caused by the Respondent's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the Respondent's responsibility to comply with any other deadline(s) specified in this Consent Order.
- 4.9 No informal advice, guidance, suggestions, or comments by staff of the DEQ regarding reports, work plans, proposals, plans, specifications, schedules, or any other writing submitted by the Respondent will be construed as relieving the Respondent of its obligation to obtain written approval of the DEQ if and when required by this Consent Order.

V. MODIFICATIONS AND EXTENSIONS

- 5.1 At the request of the Respondent, a work plan, proposal, or other document approved or approved with specific modifications by the DEQ, with the exclusion of the specified deadlines set forth in Section II, Compliance Program, of this Consent Order, may be modified by the OWMRP District Supervisor ("District Supervisor").

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- 5.2 The Respondent and the DEQ agree that the Office Chief may, but in no circumstances is obligated to, grant the Respondent an extension of the specified deadlines set forth in this Consent Order. Any extension shall be preceded by a timely written request, received by the DEQ no later than ten (10) business days prior to the pertinent deadline, which shall include:
- a. An identification of the specific deadline(s) of this Consent Order that will not be met.
 - b. A detailed description of what will prevent the Respondent from meeting the deadline(s).
 - c. A description of the measures the Respondent has taken and/or intends to take to meet the required deadline(s).
 - d. The length of the extension requested and the specific date(s) on which the obligation(s) will be met.
- 5.3 The Office Chief shall respond promptly to such requests and shall not unreasonably withhold approval for such requests.
- 5.4 Any extension of the specified deadlines or other modifications and amendments of this Consent Order shall require a formal written amendment of this Consent Order, shall be signed by the Respondent and the DEQ ("Parties"), shall have as their effective date the date on which they are signed by the Office Chief, and shall be incorporated into and become an enforceable part of this Consent Order.

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VI. REPORTING

- 6.1 The Respondent shall submit all items required in Section II, Compliance Program, to the Lansing District Supervisor, OWMRP, DEQ, P.O Box 30241 Lansing, Michigan 48909-7742, unless specifically directed otherwise within this Consent Order. The cover letter with each submittal shall identify the specific paragraph and requirement of this Consent Order that the submittal is intended to satisfy. If the address of the District Supervisor changes, the Respondent will be notified and shall make all subsequent submittals to any new address of which they are notified.
- 6.2 The Respondent shall verbally report any violation(s) of the terms and conditions of this Consent Order to the District Supervisor by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with a written report within five (5) business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), the precise cause or causes of the violation(s), a detailed description of any action(s) taken or proposed to correct the violation(s), and a schedule for the implementation of any proposed corrective action(s). The Respondent shall report any anticipated violation(s) of this Consent Order to the District Supervisor in advance of the relevant deadlines, whenever possible.

VII. RETENTION OF RECORDS

- 7.1 Upon request by an authorized representative of the DEQ, the Respondent shall make available to the DEQ all records, plans, logs, and other documents required to be maintained under this Consent Order, or pursuant to Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules. All such documents shall be retained at the Disposal Area for at least a period of three (3) years from the date of generation of the record unless a longer period of record retention is required by Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules.

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VIII. RIGHT OF ENTRY

- 8.2 The Respondent shall allow any authorized representative or contractor of the DEQ, upon presentation of proper credentials, to enter upon the premises of the Site at all reasonable times for the purpose of monitoring compliance with the provisions of this Consent Order. This paragraph in no way limits the authority of the DEQ to conduct tests and inspections pursuant to the NREPA and its rules or any other applicable statutory provision.

IX. FINES, COSTS, AND PENALTIES

- 9.1 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall pay the sum of \${_____} to the State of Michigan in settlement of the DEQ's claim for civil fines arising from the violations alleged in the above-referenced LOWs and Compliance Communication.
- 9.2 For each failure to comply with the provisions of Section II, Compliance Program, of this Consent Order, the Respondent shall pay to the State of Michigan stipulated penalties in an amount of \$250 per violation per day for one (1) through seven (7) days of violation; \$500 per violation per day for eight (8) through fourteen (14) days of violation; and \$750 per violation per day for each day of violation thereafter. Stipulated penalties shall be paid within thirty (30) days after receiving a written demand made by the DEQ.
- 9.3 To ensure timely payment of any civil fines, penalties, and costs due under this Consent Order, the Respondent shall pay an interest penalty to the State of Michigan each time the Respondent fails to make a complete or timely payment. This interest penalty shall be based on the rate set forth at Section 6013(6) of the Revised Judicature Act, 1961 PA 236, as amended, MCL 600.6013(6), using the full increment of amount due as principal, and calculated from the due date for the payment until the delinquent payment is finally made in full.

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- 9.4 The Respondent shall make all payments due under this Consent Order by certified or cashier's check made payable to the "State of Michigan" and mailed to the DEQ, Revenue Control Unit, P.O. Box 30657, Lansing, Michigan 48909-8157, or hand delivered to the DEQ, Revenue Control Unit, 1st Floor, Van Wagoner Building, 425 West Ottawa Street, Lansing, Michigan 48933. To ensure proper credit, all payments made pursuant to this Consent Order must include Payment Identification Number OWMRP _____ on the front of the check and/or in the cover letter with the payment.
- 9.5 The Respondent agrees not to contest the legality of the civil fine or the costs of surveillance and enforcement paid pursuant to this section. The Respondent further agrees not to contest the legality of any stipulated penalties or interest penalties assessed pursuant to this section but reserves the right to dispute the factual basis upon which a demand by the DEQ for stipulated penalties or interest penalties is made.
- 9.6 Liability for or payment of stipulated penalties pursuant to this Consent Order shall not preclude the State of Michigan from seeking injunctive relief or other relief for the Respondent's failure to comply with the requirements of this Consent Order and/or any permit(s) or license(s) required to comply with this Consent Order.

- X. **DISPUTE RESOLUTION** 10.1 Unless otherwise provided in this Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order. However, the procedures set forth in this section shall not apply to actions by the state of Michigan to enforce obligations of the Respondent that have not been disputed in accordance with this section. Engagement of a dispute resolution between the Parties shall not be cause for the Respondent to delay the performance of any compliance requirements or response activity. Any dispute that arises under this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The period of negotiations shall not exceed twenty (20) days from the date of written notice by any Party that a dispute has arisen, unless the

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time period for negotiations is modified by written agreement between the Parties. The dispute shall be considered to have arisen when one Party sends the other Party a written notice of dispute. If agreement cannot be reached on any issue within this twenty- (20-) day period, the DEQ shall provide a written statement of its decision to the Respondent and, in the absence of initiation of formal dispute resolution by the Respondent under Paragraph 10.3, the DEQ position, as outlined in its written statement of decision, shall be binding on the Parties.

10.2 If the Respondent and DEQ cannot informally resolve a dispute under Paragraph 9.1, the Respondent may initiate formal dispute resolution by requesting a review of the disputed issues by the Office Chief. This written request must be filed with the Office Chief within fifteen (15) days of the Respondent's receipt of the DEQ's statement of decision that is issued at the conclusion of the informal dispute resolution procedure set forth in Paragraph 9.1. The Respondent's request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation upon which the Respondent bases its position. Within fourteen (14) days of the Office Chief's receipt of the Respondent's request for a review of disputed issues, the Office Chief will provide a written statement of decision to the Respondent, which will include a statement of his/her understanding of the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting her/his position; and all supporting documentation relied upon by the Office Chief's review of the disputed issues. The Office Chief's review of the disputed issues may be extended by written agreement of the Parties.

10.3 The written statement of the Office Chief issued under Paragraph 10.3 shall be binding on the Parties unless, within fifteen (15) days after receipt of the DEQ's written statement of decision, the Respondent files a petition for judicial review in a court of competent jurisdiction that shall set forth a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Order. Nothing in this Consent Order affects the limitations on the timing of judicial review of the

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DEQ decision regarding the selection, extent, or adequacy of any response activity as provided for in Part 201.

- 10.4 An administrative record of the dispute shall be maintained by the DEQ. The administrative record shall include all of the information provided by the Respondent pursuant to Paragraph 9.3, as well as any other documents relied upon by the DEQ in making its final decision pursuant to Paragraph 10.3. Where appropriate, the DEQ shall allow submission of supplemental statements of position by the Parties to the dispute.
- 10.5 In proceeding on any dispute, the Respondent shall have the burden of demonstrating on the administrative record that the position of the DEQ is arbitrary and capricious or otherwise not in accordance with law. In proceedings on any dispute initiated by the Respondent, the Respondent shall bear the burden of persuasion on factual issues.
- 10.6 Notwithstanding the invocation of dispute resolution proceedings, stipulated penalties shall accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Order, but payment shall be stayed pending resolution of the dispute. Stipulated penalties shall be paid within thirty (30) days after the resolution of the dispute. The Respondent shall pay that portion of a demand for payment of stipulated penalties that is not subject to dispute resolution procedures in accordance with and in the manner provided in Section IX, Fines, Costs, and Penalties.

XI. FORCE MAJEURE

- 11.1 The Respondent shall perform the requirements of this Consent Order within the time limits established herein unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the Respondent's obligations under this Consent Order in accordance with this section.
- 11.2 For the purpose of this Consent Order, "Force Majeure" means an occurrence or nonoccurrence arising from causes not foreseeable, beyond the control of, and without

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the fault of the Respondent, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the Respondent's diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the Respondent's actions or omissions.

- 11.3 The Respondent shall notify the DEQ, by telephone, within forty-eight (48) hours of discovering any event that causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or causes of delay, the measures taken by the Respondent to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay.
- 11.4 Failure of the Respondent to comply with the notice requirements of Paragraph 10.3, above, shall render this section void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of Paragraph 10.3.
- 11.5 If the Parties to this Consent Order agree that the delay or anticipated delay was beyond the control of the Respondent, this may be so stipulated and the parties to this Consent Order may agree upon an appropriate modification of this Consent Order. If the Parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X, Dispute Resolution, of this Consent Order. The burden of proving that any delay was beyond the reasonable control of the Respondent, and that all the requirements of this section have been met by the Respondent, is on the Respondent.
- 11.6 An extension of any given compliance date based upon a particular incident does not

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necessarily mean that the Respondent qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

XII. GENERAL PROVISIONS

- 12.1 With respect to any violations not specifically addressed and resolved by this Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the Respondent to comply with the requirements of any state or federal law, including the NREPA and its rules.
- 12.2 Execution of the schedule contained in this Consent Order shall not be construed to waive, estop, or otherwise diminish the DEQ's right to seek or impose civil liability upon, and seek appropriate relief from, the Respondent for degradation of waters of the State and the designated uses thereof arising out of the failure of the Respondent to achieve a proper cleanup pursuant to this Consent Order.
- 12.3 This Consent Order does not constitute a warranty or representation of any kind by the DEQ that the response activities performed in accordance with this Consent Order or DEQ-approved work plans will result in the achievement of the remedial criteria established by law, or that the response activities will ensure protection of public health, safety, or the environment.
- 12.4 This Consent Order in no way affects the Respondent's responsibility to comply with any other applicable state, federal, or local laws or regulations including, without limitation, any corrective action or similar requirements applicable to the Site pursuant to the NREPA and its rules.
- 12.5 Nothing in this Consent Order is or shall be considered to affect any liability the Respondent may have for natural resources damages caused by the Respondent's ownership and/or operation of the Site. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.

city-of-flint-bray-road-co-2014-02-06b-draft

Privileged and Confidential Settlement Communication

This document is for the purpose of settlement and is subject to the privilege that applies to communications made in settlement negotiations. It is provided solely for the consideration and use of the intended recipient(s), their principals, and their legal counsel. It should not be disclosed to any other person without the express consent of the Department of Environmental Quality.

- 12.6 The Parties agree that the terms and conditions of this Consent Order will be enforceable in circuit court. The Parties further agree that the appropriate venue for the enforcement of this Consent Order shall be the Circuit Court for Genesee County or Ingham County, State of Michigan, which courts shall also be appropriate for dispute resolution.
- 12.7 If any provision or authority of this Consent Order or the application of this Consent Order to any Party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other Parties or circumstances and the remainder of the Consent Order shall remain in force and shall not be affected thereby.
- 12.8 The provisions of this Consent Order shall be binding on the Respondent, the DEQ, and their successors and assigns. The Respondent shall give notice of this Consent Order to any prospective successor in interest prior to transfer of ownership of the Site property or any portion thereof and shall notify the DEQ of such proposed sale or transfer.

XIII. TERMINATION

- 13.1 This Consent Order shall remain in full force and effect until expressly terminated by a written Notice of Termination issued by the Office Chief. The Respondent may request that the Office Chief issue a written Notice of Termination at any time after achieving full compliance with this Consent Order. Such a request shall consist of a written certification that the Respondent has fully complied with all of the requirements of this Consent Order and has made payment of any fines, penalties, and costs required under this Consent Order. Specifically, this certification shall include:
- a. The date of compliance with each provision of the compliance program in Section II of this Consent Order and the date any fines, penalties, or costs were paid;

city-of-flint-bray-road-co-2014-02-06b-draft

Privileged and Confidential Settlement Communication

This document is for the purpose of settlement and is subject to the privilege that applies to communications made in settlement negotiations. It is provided solely for the consideration and use of the intended recipient(s), their principals, and their legal counsel. It should not be disclosed to any other person without the express consent of the Department of Environmental Quality.

- b. a statement that all required information has been reported to the District Supervisor;
 - c. confirmation that all records required to be maintained pursuant to this Consent Order are being maintained by the City; and
 - d. additional relevant information requested by the Office Chief.
- 13.2 The Office Chief shall issue a written Notice of Termination unless the DEQ determines that the Respondent has not submitted the certification required under this section, has failed to submit the information specifically requested by the Office Chief, or has failed to comply with, or complete, all of the requirements of this Consent Order.

city-of-flint-bray-road-co-2014-02-06b-draft

Privileged and Confidential Settlement Communication

This document is for the purpose of settlement and is subject to the privilege that applies to communications made in settlement negotiations. It is provided solely for the consideration and use of the intended recipient(s), their principals, and their legal counsel. It should not be disclosed to any other person without the express consent of the Department of Environmental Quality.

XIII. SIGNATORIES

The undersigned CERTIFY they are fully authorized by the party they represent to enter into this Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it.

{OWNER/OPERATOR'S FULL LEGAL NAME}**DEPARTMENT OF ENVIRONMENTAL
QUALITY**

By: _____

Dan Wyant
Director

Name: _____

Title: _____

By: _____

Date: _____

Elizabeth M. Browne, Chief
Office of Waste Management and
Radiological Protection

Date: _____

APPROVED AS TO FORM:Bill Schuette
Attorney General**{INSERT NAME OF AAG ASSIGNED} {P_____}**Assistant Attorney General
Environment, Natural Resources, and
Agriculture Division
Department of Attorney General
Constitution Hall, 5th Floor, South Tower
525 West Allegan Street
Lansing, Michigan 48933

Date: _____

Rennaker, Joanne (DEQ)

From: Pallone, Maggie (DEQ)
Sent: Thursday, October 01, 2015 6:55 PM
To: Benzie, Richard (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Re: Kildee Letter DRAFT

What about on the request to the Feds? #4 deals with following through the workgroup recommendations.
 Thanks
 Maggie

On Oct 1, 2015, at 6:48 PM, Benzie, Richard (DEQ) <BENZIER@michigan.gov> wrote:

I would use this phrasing, "Begin optimizing corrosion control treatment in the Flint drinking water system," realizing that this additional treatment won't begin until sometime in October (hopefully).

You could also say, "Accelerate implementation of optimal corrosion control treatment in the Flint drinking water system."

From: Pallone, Maggie (DEQ)
Sent: Thursday, October 01, 2015 5:20 PM
To: Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Subject: FW: Kildee Letter DRAFT
Importance: High

Steve or Richard, please see the attached letter. Is that the correct wording for request #4?
 Thanks,
 Maggie

From: Brown, Eric (GOV)
Sent: Thursday, October 1, 2015 5:16 PM
To: Lyon, Nick (DHHS) <LyonN2@michigan.gov>; Wyant, Dan (DEQ) <WyantD@michigan.gov>
Cc: Hertel, Elizabeth (DHHS) <HertelE@michigan.gov>; Pallone, Maggie (DEQ) <PalloneM@michigan.gov>; McBride, Bill (GOV) <mcbrideb@michigan.gov>
Subject: Kildee Letter DRAFT
Importance: High

Nick & Dan:
 Please take a look at the attached draft letter to Congressman Kildee, particularly the 4 requests for federal action. Please edit/add as necessary. Thanks for your quick attention to this – we need to have this ready for the Governor's signature by 8:30am tomorrow. Sorry for the tight turnaround.
 --Eric

Eric K Brown
 Senior Federal Policy Representative
 State of Michigan – Governor Rick Snyder
 Washington D.C. Office
 202.624.5840 (office)
 202.480.7235 (mobile)

Rennaker, Joanne (DEQ)

From: Devereaux, Tracy Jo (DEQ)
Sent: Monday, September 14, 2015 1:30 PM
To: DEQ-LogLetter
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); DEQ-Legislative-Contact; Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: RE: LEG00186 Kildee / Water quality issues in the city of Flint
Attachments: Congressman Kildee Response.docx

Given that this was a time-sensitive log letter, we attached a draft as most staff are at the retreat.

From: DEQ-LogLetter
Sent: Thursday, September 10, 2015 1:22 PM
To: Devereaux, Tracy Jo (DEQ)
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); DEQ-Legislative-Contact; Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: LEG00186 Kildee / Water quality issues in the city of Flint

Assigned to ODWMA

Original to Karen (T.F.)
2 hard copies to Mary Beth



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

September **, 2015

The Honorable Daniel T. Kildee
United States House of Representatives
Washington, DC 20515

Dear Representative Kildee:

Thank you for your letter of September 9, 2015, regarding water quality in the city of Flint (City). Your interest in this matter is appreciated. The Michigan Department of Environmental Quality (MDEQ) considers its responsibility to ensure safe drinking water for its citizens a top priority. The MDEQ maintains a robust public water supply regulatory program through long-standing partnerships with both the Region 5 Office of the United States Environmental Protection Agency (USEPA) and the state's regulated public water systems to achieve the shared goal of compliance with drinking water standards.

With respect to the draft memo referenced in your letter, the MDEQ never received copies of this draft memo from the USEPA Region 5, nor would we expect to while it is only a draft. The MDEQ became aware of the existence of this document because a reporter informed our Public Information Officer that it was available on the Web site of the American Civil Liberties Union. In subsequent discussions with the USEPA, our employees were told this draft memo was under further review by the USEPA's Region 5 managers. We were informed they would send copies when the document was final. We have yet to receive the final version.

Regulations associated with lead, copper and corrosion control (LCR) require communities to monitor water quality at customer taps. Compliance is determined by analyzing samples collected from targeted, high-risk residences that have been identified as having lead plumbing in the home, lead service connections, or copper piping with joints that used solder containing high concentrations of lead.

In an attempt to simulate worst case conditions, the LCR requires "first draw" samples be collected from designated taps after a period of no use that is representative of an overnight stagnation, typically six to eight hours. If more than ten percent of these compliance samples report lead above the federally established Action Level (AL) of 15 parts per billion (ppb), a water supply has an AL exceedance. An exceedance is not a violation. It triggers other requirements, including public notification, additional water quality sampling, and possibly further treatment.

The compliance monitoring for lead within the City has never exceeded this AL, either before or after the City switched sources and treatment methods. However, based on the population served by the Flint public water supply system, the City is required to not only comply with the lead AL of 15 ppb, but to also provide optimized corrosion control treatment.

When the LCR was first implemented, water systems had the opportunity to demonstrate they were already employing optimized corrosion control by sampling for lead concentrations using the monitoring requirements of this regulation. When Flint changed sources and modified

treatment from Lake Huron water treated conventionally by the Detroit Water and Sewerage Department, to the Flint River and lime softening treatment at the Flint Water Treatment Plant, the city was afforded the same opportunity of conducting lead monitoring during the first two 6-month monitoring periods to see if they were already providing optimal corrosion control.

The two monitoring periods during which lead samples were collected throughout Flint in accordance with these requirements were July through December 2014 and January through June 2015. As indicated above, neither round of lead compliance monitoring exceeded the AL. However, the results were unable to demonstrate that the City had optimized corrosion control treatment.

At that point, the MDEQ notified the City in correspondence dated August 17, 2015, that it must provide additional treatment to meet this optimized corrosion control requirement. Despite the LCR allowing a period of two years to evaluate, select and implement optimal corrosion control treatment, the City has committed to having this treatment in place by January 2016. The City also invited a USEPA representative from the Office of Research and Development to consult with the City's Technical Advisory Committee that will oversee the installation of additional corrosion control treatment at the water treatment plant.

Under the LCR, public water supplies like Flint are required to provide individual lead results to those customers whose homes are sampled for compliance with the AL. Each customer with an individual sample result that exceeds 15 parts per billion is also provided information on actions they can take to limit lead exposure in their drinking water. Furthermore, results from the most recent lead compliance monitoring determination are included each year in the annual consumer confidence report, also known as their annual water quality report that each community must provide to customers. As required by EPA, this report also includes general consumer awareness information regarding lead. You may access the latest report from Flint at: <https://www.cityofflint.com/wp-content/uploads/CCR-2014.pdf>. This report covers the results of water quality monitoring during May through December of 2014 when the city began using the Flint River.

Lead blood level monitoring is overseen by the Michigan Department of Health and Human Services (MDHHS). Their review of lead blood 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 lead blood levels in comparison with levels reported for the previous three years.

Additionally, analyses of water entering the distribution system after the water treatment plant continue to show no lead present. The lead being detected in water samples collected at peoples' homes is coming from service connection piping and household plumbing, the majority of which is the responsibility of the property owner. The Flint Water Department is responsible for providing high quality drinking water, but they cannot control the variety of materials used in plumbing components on private property. Even after the City initiates optimal corrosion control treatment, there will be circumstances where elevated lead may be present in customer taps as long as there are lead materials and lead components associated with service lines and home plumbing. Reducing public exposure to lead in drinking water cannot be achieved by public water supply regulation alone. The MDEQ has contacted the MDHHS in an attempt to develop an outreach campaign designed to inform civic leaders and City residents in Flint as well as other cities in Michigan about the primary sources of lead and actions they may take to minimize exposure.

As for the overall acceptability of the drinking water in Flint, the City currently has no unresolved violations of state and federal drinking water standards. The MDEQ continues to assist the City in providing a safe, reliable, and adequate supply for protecting public health, enhancing public safety, and as a pillar for economic development to advance the quality of life in this community.

If you should have additional questions, please contact Ms. Liane Shekter Smith, P.E., Chief, Office of Drinking Water and Municipal Assistance, at 517-284-6543; shekterl@michigan.gov; or MDEQ, P.O. Box 30241, Lansing, Michigan 48909-7741; or you may contact me.

Sincerely,

Dan Wyant
Director
517-284-6700

cc: State Senator Jim Ananich
State Representative Sheldon Neeley
State Representative Phil Phelps
Mayor Dayne Walling, City of Flint
Mr. Howard Croft, City of Flint
Ms. Susan Hedman, USEPA
Mr. Thomas Poy, USEPA
Mr. Michael Schock, USEPA
Mr. Darren Lytle, USEPA
Ms. Denise Fortin, USEPA
Mr. Marc Edwards, Virginia Tech
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Ms. Madhu Anderson, Deputy Director, MDEQ
Ms. Maggie Pallone, Deputy Director, MDEQ
Mr. Brad Wurfel, Communications Director, MDEQ
Ms. Liane Shekter Smith, MDEQ
Mr. Richard Benzie, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Pat Cook, MDEQ

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, September 29, 2015 9:40 AM
To: Pallone, Maggie (DEQ); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'
Cc: Feuerstein, Heather (DEQ); Tommasulo, Karen (DEQ)
Subject: Background Timeline
Attachments: City of Flint Background-Draft.docx

Attached is the timeline I put together previously. I didn't have anything to add so if you have questions about the timeline let me know.

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

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)

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, September 15, 2015 8:00 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)
Subject: Draft - Flint Background/Timeline
Attachments: City of Flint Background.docx

See attached. Not sure how detailed they want it.

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

City of Flint Background

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 99,000

City of Flint Timeline

December 2011 – Flint Emergency Financial Manager Appointed by Governor Snyder

April 2013 – Flint rejects DWSD contract and instead 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 Requests full time use of Flint Water Treatment Plant with Flint River

May 2014 – Flint stops purchasing DWSD. Starts using the City of Flint WTP and Flint River

August 2014 – Flint E.Coli Bacteria violation, Partial System Boil Water Advisory

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April 2015 – Flint Financial Emergency Ends

July 2015 – 2nd 6 month lead and copper sampling completed 69 samples, 90th% = 11 ppb

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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)

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 16, 2015 1:05 PM
To: Pallone, Maggie (DEQ); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'
Cc: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Sygo, Jim (DEQ) (SygoJ@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov); Wyant, Dan (DEQ)
Subject: Draft Background, Timeline, Quadrant Diagram
Attachments: Flint-QuadrantDiagram-Draft.xlsx; City of Flint Background-Draft.docx

Attached are drafts of the Quadrant Diagram and the Background-Timeline. I am now working on a draft FAQ.

Below are some additional general informational handouts available from EPA that we may want to consider including.

Understanding the Safe Drinking Water Act

http://water.epa.gov/lawsregs/guidance/sdwa/upload/2009_08_28_sdwa_fs_30ann_sdwa_web.pdf

Drinking Water Costs and Federal Funding

http://water.epa.gov/lawsregs/guidance/sdwa/upload/2009_08_28_sdwa_fs_30ann_dwsrf_web.pdf

Water Facts

http://water.epa.gov/lawsregs/guidance/sdwa/upload/2009_08_28_sdwa_fs_30ann_waterfacts_web.pdf

Public Access to Information and Public Involvement

http://water.epa.gov/lawsregs/guidance/sdwa/upload/2009_08_28_sdwa_fs_30ann_publicinvolve_web.pdf

Let me know if you have questions or need anything further.

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

DRAFT

DRINKING WATER - LEAD - DISTRIBUTION OF RESPONSIBILITIES

Environmental Protection Agency Promulgation of Federal Safe Drinking Water Act Rules 1974 Safe Drinking Water Act 1991 Lead and Copper Rule 2000 Lead and Copper Rule Minor Revisions 2007 Lead and Copper Rule Short Term Revisions ???? Lead and Copper Rule Long Term Revisions Granting Primacy of Federal Regulations to States Auditing of State Public Water Supply Programs Provide Funding to States	Michigan Department of Environmental Quality Primacy - Michigan Safe Drinking Water Act and Administrative Rules Oversight of public water systems Inspections Construction Permitting Provide loans to water systems for public infrastructure improvements State Laboratory Services Laboratory Certification Establish monitoring requirements, quantity and frequency Verification of monitoring results and compliance determination Notify water systems of Action Level Exceedance Establish Water Quality Parameter Ranges, as necessary State Reporting to EPA Operator Training and Certification
City of Flint Water System Certified Operation of public water system Establish Water Rates Obtain construction permits Reporting to MDEQ Coordination of lead and copper sampling Establishing a Tiered Sampling Pool Providing Sampling Kits and Instructions to customers Obtain signed statements from participating customers Obtain sample analysis Provide individual lead sample result to participants Comply with Action Levels for lead and copper Provide lead monitoring and notice Certification to MDEQ Provide Annual Report (CCR) to all customers Conduct Water Quality Parameter Monitoring Recommend and Install Optimized Corrosion Control Treatment Provide Public Notification, as necessary Replace public portion of lead service, as necessary	Water Customers Participate in lead sampling as requested Request lead testing if concerned Follow lead sampling Instructions Provide signed information on how sample was collected Review individual result material Follow instructions for reducing lead exposure Replace private leaded service line and plumbing materials with lead-free products Obtain plumbing permits and comply with code requirements Pay Water Bills Read Annual Report (CCR) Read and follow Public Notification materials

DRAFT

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

December 2011 – Flint Emergency Financial Manager Appointed by Governor Snyder
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 January 2015 – 1st 6 month lead and copper sampling completed 100 samples, 90th% = 6 ppb
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 July 2015 – 2nd 6 month lead and copper sampling completed 69 samples, 90th% = 11 ppb
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 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)

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 30, 2015 9:12 AM
To: Pallone, Maggie (DEQ); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Sygo, Jim (DEQ) (SygoJ@michigan.gov)
Cc: Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov); Shaler, Karen (DEQ); Tommasulo, Karen (DEQ); Feuerstein, Heather (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)
Subject: Draft Briefing to Governor
Attachments: Flint Briefing - Draft 9-30-2015.dotx.docx
Importance: High

Attached is the draft briefing memo for the Governor. We did our best to keep it to one page, but let us know if you have other content needs.

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

Meeting/ Policy Briefing Template

Policy or Meeting Topic

City of Flint and Lead Concerns in Customer Tap Water

Staff Lead**Purpose of Meeting/ Policy Paper****Decision Points****Recommendation****Key Stakeholders Positions**

EO:

Dept:

Legislature:

Outside Interest:

Current Press/ Communications**Executive Summary****Background/ Attachments**

Lead can pose health risks to anyone, but there are heightened risks for pregnant women, infants, and children. Lead in drinking water is regulated under the Safe Drinking Water Act. As there is no safe level of exposure to lead, EPA has established a non-enforceable goal of zero for lead concentrations in drinking water. For most contaminants, EPA sets an enforceable regulation, a maximum contaminant level (MCL), based on this goal. However for lead, EPA instead established a treatment technique rather than an MCL because the source of lead contamination in drinking water is most often a result from corrosion of plumbing materials belonging to water system customers and not under the ownership or control of the public water system.

This is also the case in the City of Flint. Water from the City of Flint Water Treatment Plant using the Flint River has been analyzed and shown to contain no detectable level of lead. However, in a 2011 EPA survey, the City of Flint reported that approximately 18,000 out of 33,000 total active service connections used lead service line materials. As more than half of the City's 550 miles of water mains are more than 75 years old, the use of lead material in service connections was common at that time. The City owns a small portion of each service connection from the public water main to a curb stop valve at the edge of the Right-of-Way. The remaining portion is owned by, and the responsibility of each individual water customer.

Therefore, the treatment technique regulation for lead, the Lead and Copper rule (LCR), requires water systems to control the corrosivity of their water. The regulation also requires systems to collect tap samples from sites served by the system that are more likely to have plumbing materials containing lead. If more than 10% of tap water samples exceed the lead action level (AL) of 15 parts per billion (ppb), then water systems are required to take additional actions which can include:

- Taking further steps to optimize their corrosion control treatment (for water systems serving 50,000 people that have not fully optimized their corrosion control).

Meeting/ Policy Briefing Template

- Educating the public about lead in drinking water and actions consumers can take to reduce their exposure to lead.
- Replacing the portions of lead service lines under the water system's control if ongoing lead AL exceedance occurs following implementation of optimized corrosion control treatment (OCCT).

The City of Flint has conducted lead monitoring at customer taps since 1992 and has never exceeded the 15 ppb lead AL, either as a customer of the Detroit Water and Sewerage Department (DWSD), or while operating the Flint Water Treatment Plant (WTP) using the Flint River. Following this May 2014 change from DWSD to the Flint WTP using the Flint River, the City conducted two six month periods of expanded lead monitoring at customer taps to demonstrate their lime softening treatment process optimized corrosion control. This sampling concluded on June 30, 2015. While both periods continued to comply with the lead AL, lead levels did not demonstrate OCCT, and the City must now install additional treatment to meet this optimization requirement.

Under LCR requirements, the City could take up to 4 years to study, recommend, install, and implement treatment. However, the City has committed to an accelerated schedule in order to implement treatment as soon as possible. The Flint WTP is expected to start using a new water source, Lake Huron from the Karegnondi Water Authority, in late 2016. When this occurs the Flint WTP will continue to provide OCCT, and again conduct two six month periods of expanded monitoring in compliance with LCR requirements.

OCCT will help minimize, but cannot eliminate lead exposure from customer tap water. Removal of lead materials is the only means to eliminate such exposure. However, replacement is a shared responsibility between the City and its customers, as research has shown that partial lead service line replacement can increase rather than decrease lead exposure. At an estimated average cost of \$4,000 to replace each service line, the total cost to complete such work could easily exceed \$60 million and would likely take many years to complete. At this time any effort by the City of Flint to replace lead service lines would be voluntary since the City continues to comply with the LCR lead AL.

In addition, it is widely recognized that drinking water is not a primary source of lead exposure and poisoning. Recent health studies show no direct correlation between water sampling results and blood lead level concentrations measured in children.

EPA promulgated the LCR in 1991 and revised the regulation in 2000 and 2007. A long term revision to the LCR is currently underway. A national workgroup in August provided a report with recommendations for revisions to the LCR. It is worth noting that this report's recommendations did not include changes to existing LCR sample collection protocols, despite concerns by some organizations that these protocols do not capture representative exposure levels. EPA must now consider whether to promulgate any of these recommended changes into law.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 10, 2014 10:43 AM
To: prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)
Subject: Draft CC Flint OEL
Attachments: CC-Flint-OEL.docx

See attached draft. Please provide any comments ASAP. Thanks.

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

Mr. Brent Wright, Operator In Charge
City of Flint WTP

SUBJECT: COMPLIANCE COMMUNICATION
Total Trihalomethane Operational Evaluation Requested

Under the Stage 2 Disinfectants and Disinfection Byproduct Rule the City of Flint has been required to collect samples for the analysis of Total Trihalomethane (TTHM) and Haloacetic Acids (HAA5) at eight sites within the City's water distribution system. The City has completed two quarterly monitoring periods since changing its source water to the Flint River effective April 25, 2014.

Normally an Operational Evaluation Level (OEL) would be calculated in accordance with the Michigan Safe Drinking Water Act (Public Act 399, 1976, as amended) Administrative Rule 7196 (R 325.107196), each quarter once three quarters of results have been obtained and compared with the respective maximum contaminant level (MCL) for TTHM. Normally the calculation would be made as follows:

$$(2 \times \text{current quarter} + \text{sum of 2 previous quarters}) \text{ divided by } 4$$

As the City of Flint currently has only two quarters of data the calculation has been modified as follows:

$$(2 \times \text{current quarter} + \text{previous quarter}) \text{ divided by } 4$$

The resulting OEL for each site is listed in the table below, all results are in parts per billion (ppb):

		TTHM			HAA5	
	5/21/14	8/21/14	Mod. OEL	5/21/14	8/21/14	Mod. OEL
DBP1 McDonalds 3719 Davison	162.4	145.3	113	64	43	38
DBP2 Liquor Palace 822 S. Dort Highway	111.6	112	84	52	40	33
DBP3 North Flint Auto 3302 S. Dort Highway	96.5	127.2	88	48	31	28
DBP4 University Market 3606 Corunna	106.4	181.3	117	55	24	26
DBP5 B&P Gas Station 2501 Flushing	75.1	196.2	117	38	17	18
DBP6 Salem Housing 3216 MLK Boulevard	82.2	112.4	77	41	25	23
DBP7 Kroger 5018 Clio Road	88.2	144.4	94	49	30	27
DBP8 Taco Bell 6204 N. Saginaw	79.2	118.3	79	50	37	31

As shown in the table above, even with this less restrictive modified method, six of the City's eight sites already exceed the OEL limit of 80 ppb for TTHM. The City's the two other sites are both more than 95% of the TTHM OEL limit.

The Maximum Contaminant Level (MCL) for TTHM and HAA5 is based on a locational running annual average for each site, essentially the average at each site over the four previous quarterly monitoring periods. However, with TTHM levels of this magnitude, it is likely the MCL will be exceeded for at least one of these eight sites from just three quarters of monitoring results. For TTHM, four quarters at the MCL of 80 ppb (4 x 80) would provide 320 ppb allowable. As an example, site DBP1 through just two quarterly monitoring periods has a total of 307 ppb (162+145), leaving only 13 ppb over two more quarterly monitoring periods to maintain compliance with the MCL.

Therefore, this office is requesting the City of Flint complete an Operational Evaluation in accordance with Administrative Rule 719I (R325.10179I). The Operational Evaluation Report shall be submitted to this office no later than November 28, 2014. The report shall not be limited in scope and shall include the following:

Examination of Treatment Operational Practices

- Changes in source water quality
- Treatment changes
- Storage tank operations
- Excess storage capacity
- Treatment problems that contribute to TTHM formation

Examination of Distribution Operational Practices

- Storage tank operations
- Excess storage capacity
- Distribution system flushing

The report shall also include steps the City could consider to minimize future exceedances.

Additional guidance on completing the Operational Evaluation Report, including a number of forms that can be used to gather and evaluate water system information is provided in the EPA's Operational Evaluation Guidance Manual. This document is available on the EPA's website at the following link:

http://www.epa.gov/ogwdw/disinfection/stage2/pdfs/draft_guide_stage2_operationalevaluation.pdf

Be advised, failure to submit an Operational Evaluation Report by this deadline is a reporting violation subject to Tier 3 Public Notification.

The OEL is an indicator of operational performance. The water system must take proactive steps to be able to comply with the MCL's for TTHM and HAA5. While it is recognized that removal of Total Organic Carbon (TOC) disinfection byproduct precursors as part of the treatment process has performed above minimum removal requirements under the treatment technique, around 4 parts per million of organic carbon are still present in the treated water and may be leading to additional TTHM formation in the City's distribution system.

While health effects associated with disinfection byproducts contaminants are based on chronic exposure, the City has available alternatives that must be considered to achieve compliance with this drinking water public health standard.

If you have any questions regarding this information, please contact me at the number below.

Sincerely

Michael Prysby, P.E.

CC: Darnell Early
Daughtry Johnson
Howard Croft
Liane Shekter Smith, P.E.
Richard Benzie, P.E.
Stephen Busch, P.E.
Genesee Co. Health Dept.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 20, 2015 4:44 PM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov); Sygo, Jim (DEQ) (SygoJ@michigan.gov); Shaler, Karen (DEQ); prysbym@michigan.gov; cookp@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE - Daily update 10/20

Week of October 19-23 action step updates

1. Moved to be completed following after action review
10. Covered under item 13, no longer need letter.
13. Tentatively plan to meet with 10 other Flint Public schools week of 10/26.
14. Remove. Part of action step No. 1
15. Contacted DHHS to schedule meeting.
16. To be completed 10/23.
17. Lab has already integrated necessary form information
19. Conference call held with EPA specialists to discuss comments.
28. Contacted DHHS to schedule meeting.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, March 02, 2015 3:19 PM
To: 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Howes, Sarah (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: Datema, Maggie (DEQ); Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)
Subject: Draft Flint TTHM Violation Notice for comment
Attachments: Flint DBP MCL 1Q15.doc
Importance: High

Attached is a draft violation notice to the City of Flint regarding the exceedance of the drinking water standard for total trihalomethanes (TTHM) based on the latest round of samples collected in February 2015.

As predicted, the levels from the latest round are all very low, but the annual average calculation for 2 sites remains above the maximum contaminant level standard.

We plan to get the letter out on Thursday so please provide any comments/concerns/questions by Wednesday 3/4. An electronic copy of the signed letter will be provided to Maggie/Sarah for forwarding to legislative members in the Flint area as was done with the last violation notice from December.

Again, if you have any questions, please contact me directly.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

March 5, 2015 - DRAFT

Mr. Brent Wright, Operation Supervisor
City Of Flint - DPW
Flint Water Plant
4500 North Dort Highway
Flint, MI 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice – Maximum Contaminant Level for Total Trihalomethanes
Operational Evaluation – Total Trihalomethanes
1st Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels (MCL) for disinfection byproducts*, of the 1979 Administrative Code.

In accordance with R.325.10610, *MCLs for disinfection byproducts*, of the 1979 Administrative Code, the MCL for disinfection byproduct total trihalomethanes (TTHM) is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City of Flint's highest TTHM locational running annual average (LRAA), based on the last four quarters, ending February 28, 2015, is 0.105 mg/l which exceeds the standard, and that two of the eight sample site locations exceed the standard of 0.080 mg/L.

Further, in accordance with R325.10719I, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, when an operational evaluation level (OEL) at a monitoring location for TTHM exceeds 0.080 mg/L, a supply shall conduct an operational evaluation and submit a written report of the evaluation to the department not later than 90 days after being notified of the analytical result that causes the supply to exceed the operational evaluation level. As listed in the table below, our records show that TTHM operational evaluation levels for the City of Flint exceed 0.080 mg/L at one of the City's eight sample site locations.

TTHM Results (mg/L)						
	5/21/14	8/21/14	11/20/14	2/17/15	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.162	0.145	0.059	0.0162	0.096	0.059
DBP2 Liquor Palace 3302 S. Dort Highway	0.112	0.127	0.033	0.0168	0.072	0.049
DBP3 North Flint Auto 6204 N. Saginaw St.	0.097	0.118	0.041	0.0149	0.068	0.047
DBP4 University Market 2501 Flushing Road	0.106	0.196	0.094	0.0245	0.105	0.085
DBP5 Taco Bell 3606 Corunna Road	0.079	0.181	0.034	0.0151	0.078	0.063
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.088	0.144	0.054	0.0192	0.076	0.059
DBP7 Salem Housing 3216 MLK Boulevard	0.082	0.112	0.050	0.0285	0.068	0.055
DBP8 BP Gas Station 822 S. Dort Highway	0.075	0.112	0.036	0.0199	0.061	0.047

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on March 1, 2015, and will continue until TTHM LRAA is below the MCL at all sample sites.

We are encouraged by the results from the most recent round of compliance samples collected on February 17, 2015, which now show individual TTHM levels at less than half of the 0.080 mg/L standard at all locations throughout the City's system. Operational Evaluation Reports from December 2014 and February 2015 have identified possible causes and corrective measures for the previous elevated TTHM levels which we encourage the City continue implementing. These modifications have likely contributed in part to the reduction in TTHM levels reported in the most recent quarter, and suggest the City may be able to achieve compliance with the TTHM standard at all sites by continuing these efforts.

Our office is currently reviewing the Operational Evaluation report dated February 27, 2015, and will provide the City and their consultant comments as needed to help address this MCL violation.

Water systems that exceed the OEL must complete and submit an Operational Evaluation in accordance with Administrative Rule 719I (R325.10719I) within 90 days of being notified of the violation. **An updated Operational Evaluation report, which incorporates the most recent sample results, must now be completed and received by our office by no later than Friday May 29, 2015.**

If you have any other factual information you would like us to consider regarding the violation identified in this Violation Notice (VN), please provide them in a written response by March 19, 2015.

Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice (PN) as soon as practical, but no later than thirty (30) days after the supplier learns of

this type of violation, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample PN which contains the minimum required language. The City is encouraged to include additional information regarding its response efforts to this violation. **Please notify your consumers by April 1, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the public notice.** This violation must also be included in your 2015 Consumer Confidence Report (CCR), due by July 1, 2016. The PN must be repeated every quarter until you no longer exceed the TTHM standard. Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.

We anticipate and appreciate your continued cooperation in resolving this matter. If you have any questions regarding this VN, please contact us at the numbers below.

Sincerely,

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

Adam Rosenthal, EQA
Lansing District Office
Office of Drinking Water & Municipal
Assistance
517-284-6644

mfp/ar/jlr
Enclosure

cc: Mr. Jerry Ambrose, Emergency Manager, City of Flint
Mr. Daughtry Johnson, City of Flint
Mr. Howard Croft, City of Flint
Mr. Robert Bincsik, City of Flint
Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5
Genesee County Health Department
Ms. Liane Shekter Smith, P.E., DEQ
Mr. Richard Benzie, P.E., DEQ
Mr. Stephen Busch, P.E., DEQ

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, November 20 of 2014 and February 17, 2015). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the Maximum Contaminant Level (MCL). The standard for TTHMs is 80 µg/L. The location reporting the highest TTHM level was 105 ug/L; thus, our water system exceeds the TTHM MCL.

What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem in 2015. Our most recent individual sample results were all less than half the 80 µg/L standard, however since compliance is calculated using a locational running annual average (LRAA) of the most recent 4 quarters, we are still out of compliance with the MCL at 2 of 8 locations.

For more information, please contact Mr. Brent Wright at 517-787-6537 or the Flint Water Plant at 4500 North Dort Highway, Flint, MI 48505.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by the City of Flint.

CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, June 05, 2015 2:46 PM
To: 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Howes, Sarah (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: Pallone, Maggie (DEQ); Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)
Subject: Draft Flint TTHM Violation Notice
Attachments: Flint DBP MCL 2Q15.pdf

Attached is a draft violation notice to the City of Flint regarding the exceedance of the drinking water standard for total trihalomethanes (TTHM) based on the latest round of samples collected in May 2015.

As predicted, the levels from the latest round are all again below the 80 part per billion level, but the annual average calculation for 1 of the 8 sites remains above the maximum contaminant level standard. An evaluation report is not required based on these lower levels but is still being requested given August are when levels historically peak. If levels remain low enough in August the City has the potential to start complying with the standard as the high levels from last year get dropped from the calculation. We could also end up with compliance with the standard but individual results above the 80 part per billion level.

We plan to get the letter out on Tuesday June 9 so please provide any comments/concerns/questions by Monday. An electronic copy of the signed letter will be provided to Maggie/Sarah for forwarding to legislative members in the Flint area as was done with the previous violation notices.

Again, if you have any questions, please contact me directly.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

June 9, 2015

Mr. Brent Wright, Operations Supervisor
City Of Flint – Department of Public Works
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice (VN) – Maximum Contaminant Level for Total
Trihalomethanes (TTHM)
2nd Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the city of Flint (City) is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels for disinfection byproducts (MCLs)*, of the 1979 Administrative Code.

In accordance with R 325.10610, *MCLs*, of the 1979 Administrative Code, the MCL for disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City's highest TTHM LRAA, based on the last four quarters, ending June 30, 2015, is 0.094 mg/L which exceeds the standard, and at this time only one of the eight sample site locations exceed the LRAA standard of 0.080 mg/L.

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on June 1, 2015, and will continue until the TTHM LRAA is below the MCL at all sample sites.

Mr. Brent Wright

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June 9, 2015

TTHM Results (mg/L)	8/21/14	11/20/14	2/17/15	5/18/15	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.145	0.059	0.0162	0.0514	0.068	0.044
DBP2 Liquor Palace 3302 South Dort Highway	0.127	0.033	0.0168	0.0635	0.060	0.044
DBP3 North Flint Auto 6204 North Saginaw St.	0.118	0.041	0.0149	0.0452	0.055	0.037
DBP4 University Market 2501 Flushing Road	0.196	0.094	0.0245	0.0598	0.094	0.059
DBP5 Taco Bell 3606 Corunna Road	0.181	0.034	0.0151	0.0547	0.072	0.040
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.144	0.054	0.0192	0.0605	0.069	0.048
DBP7 Salem Housing 3216 MLK Boulevard	0.112	0.050	0.0285	0.0727	0.066	0.056
DBP8 BP Gas Station 822 South Dort Highway	0.112	0.036	0.0199	0.0461	0.054	0.037

We are encouraged by the results from the most recent round of compliance samples collected on May 18, 2015, which again show individual TTHM levels below 0.080 mg/L at all locations throughout the City's system. Operational Evaluation Reports from December 2014, February 2015, and May 2015, have identified possible causes and corrective measures for the previous elevated TTHM levels which we encourage the City to continue implementing. These modifications have likely contributed in part to the reduction in TTHM levels reported for the most recent quarter in comparison to levels in May 2014, and suggest the City may be able to achieve compliance with the TTHM standard at all sites by continuing these efforts.

Our office is currently reviewing the Operational Evaluation Report dated May 29, 2015, and will provide the City and their consultant with comments, as needed, to help address this MCL violation.

Further, the TTHM operational evaluation level (OEL) calculated in accordance with R 325.10719I, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, is now below the 0.080 mg/L operational evaluation trigger at all eight sample site locations. However, our office is requesting that an operational evaluation again be conducted incorporating the most recent sample results, given the increase in TTHM levels from February 2015 results, and that the next monitoring period of August has been identified as the City's peak month for TTHM levels. **Please provide our office with an updated Operational Evaluation Report by Monday, August 31, 2015.**

If you have any other factual information you would like us to consider regarding the violation identified in this VN, please provide them in a written response by June 23, 2015.

Mr. Brent Wright

3

March 5, 2015

Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice (PN) as soon as practical, but no later than thirty (30) days after the supplier learns of this type of violation, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample PN which contains the minimum required language. The City is encouraged to include additional information regarding its response efforts to this violation. **Please notify your consumers by July 1, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the PN.** This violation must also be included in your 2015 Consumer Confidence Report, due by July 1, 2016. The PN must be repeated every quarter until you no longer exceed the TTHM standard. Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.

We anticipate and appreciate your continued cooperation in resolving this matter. If you have any questions regarding this VN, please contact us at the numbers below; at prysbym@michigan.gov; or rosenthala@michigan.gov; or at DEQ, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,

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

Adam Rosenthal, Environmental Quality
Analyst
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-284-6644

Enclosure

cc: Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5
Mr. Robert Bincsik, City of Flint
Mr. Howard Croft, City of Flint
Mr. Michael Glasgow, City of Flint
Genesee County Health Department
Ms. Liane Shekter Smith, DEQ
Mr. Richard Benzie, DEQ
Mr. Stephen Busch, DEQ

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (August 21, November 20 of 2014, and February 17 & May 18 of 2015). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the MCL. The standard for TTHMs is 80 micro grams per liter ($\mu\text{g/L}$). The location reporting the highest TTHM level was 94 $\mu\text{g/L}$; thus, our water system exceeds the TTHM MCL.

What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem in 2015. Our most recent individual sample results were all less than the 80 $\mu\text{g/L}$ standard, however since compliance is calculated using a locational running annual average (LRAA) of the most recent four quarters, we are still out of compliance with the MCL at one of eight locations.

For more information, please contact Mr. Brent Wright at 517-787-6537, or the Flint Water Plant at 4500 North Dort Highway, Flint, Michigan 48505.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by the City of Flint.

CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice/certification must be sent to the Department of Environmental Quality.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, September 30, 2014 12:37 PM
To: Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov); 'Wyant, Dan (DEQ) (WyantD@michigan.gov)'
Cc: Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Howes, Sarah (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Subject: Draft Governors Briefing - Flint Water
Attachments: Governor Briefing - Flint-Draft.docx; Flint Monthly Pumpage Comparison.pdf; ODWMA-399-022.pdf

Director Wyant,

Attached is our draft of a briefing for the Governor's Office regarding City of Flint water system boil water advisories. This is per your request following our meeting last Thursday 9/25.

I have also attached a copy of the policy ODWMA-399-022 which specifically provides guidance regarding boil water advisory situations, and a chart showing the significant increase in the City of Flint's water demands following the extreme conditions experienced this past winter.

If you have any questions or need any additional information, I will be in Lansing this week on Thursday afternoon and Friday morning, and as always you can reach me on my cell phone as listed below.

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

MDEQ - Governor's Office Briefing - City of Flint Drinking Water (Draft)

What contributed to the Boil Water Advisories in the City of Flint?

A number of factors, not one specific cause, likely contributed to the Boil Water Advisories (BWA's) in the City of Flint during August and September 2014. While use of the Flint River has increased the amount of natural organic matter in the City's water, the City's water treatment plant (WTP) has performed well above treatment requirements for organic carbon removal. In addition, less than 20% of the water system was included in the advisory area. If treatment had been compromised, detections would have been widespread throughout the City, rather than in such a localized area.

The City's water distribution system has suffered from a lack of infrastructure investment and asset management. Most of the City's over 550 miles of water mains are now over 75 years old, and constructed of cast iron piping. Cast iron pipe is subject to internal corrosion, called tuberculation, which causes buildup on the pipe interior leading to water quality issues, reduced flow and pressures, and leakage. Tuberculation also encourages the development of biofilms, layers of bacteria that attach to the interior pipe wall. Biofilm growth is common in areas of piping with little or no disinfectant residual, and together with tuberculation can clog water lines to the point of insufficient water pressure.

The City has also experienced decades of a declining user base and water use associated with vacant homes, commercial businesses and industrial property. Declining water use leads to excess residence time within the City's distribution pipes and water storage facilities, accelerating tuberculation, biofilm growth, and disinfectant residual degradation. While the City has recently seen an infusion of funding for blight removal, contractors completing this work have been improperly using fire hydrants, causing hydraulic disturbances that dislodged and suspended settled debris, which may have contributed to the bacterial contamination.

The winter of 2014 was also one of the coldest experienced by the water system. The City, which historically has unaccounted water losses of over 30%, has seen even greater losses since February due to an increase in cold weather related water main breaks and leaks. The City lacks a formal maintenance program for its over 7,250 valves, which would normally be used to limit impacts during break repairs. Two valves on the transmission line used to supply the area of the BWA were found to be closed during the City's investigation, causing longer residence time, reduced disinfectant residual, reduced flow, and reduced pressure. One of these valves has remained broken.

The BWA's also occurred during the warmest and for 2014 relatively wet periods of August and September. Warm weather conditions are not only more conducive to bacterial growth but also degrade the water's disinfectant residual carried out from the WTP more quickly. Longer residence times, biofilms, and tuberculation also contribute to disinfectant residual degradation. Warm wet weather conditions also allow water contaminated with bacteria to pool around piping with leaks and breaks.

Process for Issuance and Cancellation of a Boil Water Advisory

There are a number of conditions that can trigger boil water advisories. This includes the following:

- Bacteria Monitoring Detections
- Bacteria Standards Violations
- Treatment System Failures
- Waterborne Disease Outbreaks
- Loss of System Pressure
- Water Main Breaks
- Other Interruptions in Service

The DEQ has developed policy regarding BWAs to help guide staff, provide consistency, and maintain public health. A copy of DEQ policy ODWMA-399-022 is attached.

BWA's may be self-initiated by the water system, issued collaboratively in consultation with the DEQ, or when necessary mandated by the DEQ. Requesting customers to boil the water when bacterial contamination has occurred provides an added barrier of public health protection.

The BWA's which recently occurred in the City of Flint were associated with bacteria monitoring detections and violations of bacteria standards. These advisories were issued by the City of Flint collaboratively in consultation with the DEQ.

Current regulations regarding monitoring and standards for bacteria in water distribution systems were developed by the EPA, have been in effect since 1990, and incorporated into the Michigan Safe Drinking Water Act. There are a variety of bacteria, parasites, and viruses which can potentially cause health problems if humans ingest them in drinking water. Testing water for each of these potential pathogens would be difficult and expensive. Instead, water systems test for Total coliform and E.coli. Total coliform bacteria react to water treatment in a manner similar to many pathogens. Therefore, the presence of total coliform in drinking water indicates there may be a pathway for pathogens or other contaminants to enter the system. The absence of total coliforms in the distribution system minimizes the likelihood that pathogens are present. E.Coli is itself a pathogen, and its detection would be direct evidence of a health risk.

Once a BWA has been issued, time is needed to investigate potential causes and implement corrective measures. The larger the water system, the more time this may take. Once corrective measures have been taken, samples must be collected and analyzed to confirm that bacteria are no longer present. Using the most common analytical method, samples must be incubated for a period of 24 hours before results can be obtained. In situations where the bacterial contamination has been confirmed, two consecutive rounds of safe samples collected at least 24 hours apart are normally obtained before canceling a BWA. Adding each of these steps together, a normal response period to cancel a BWA under these circumstances would be expected to take at least 3 to 4 days.

Recent History of City of Flint Water System

Historically the City of Flint had been a customer of the Detroit Water and Sewerage Department (DWSD) while simultaneously maintaining the City of Flint WTP to provide emergency backup service using the Flint River. The WTP performed quarterly test operations to maintain readiness and was utilized twice in 2009, supplying water once for 2 days and the other for 3 days.

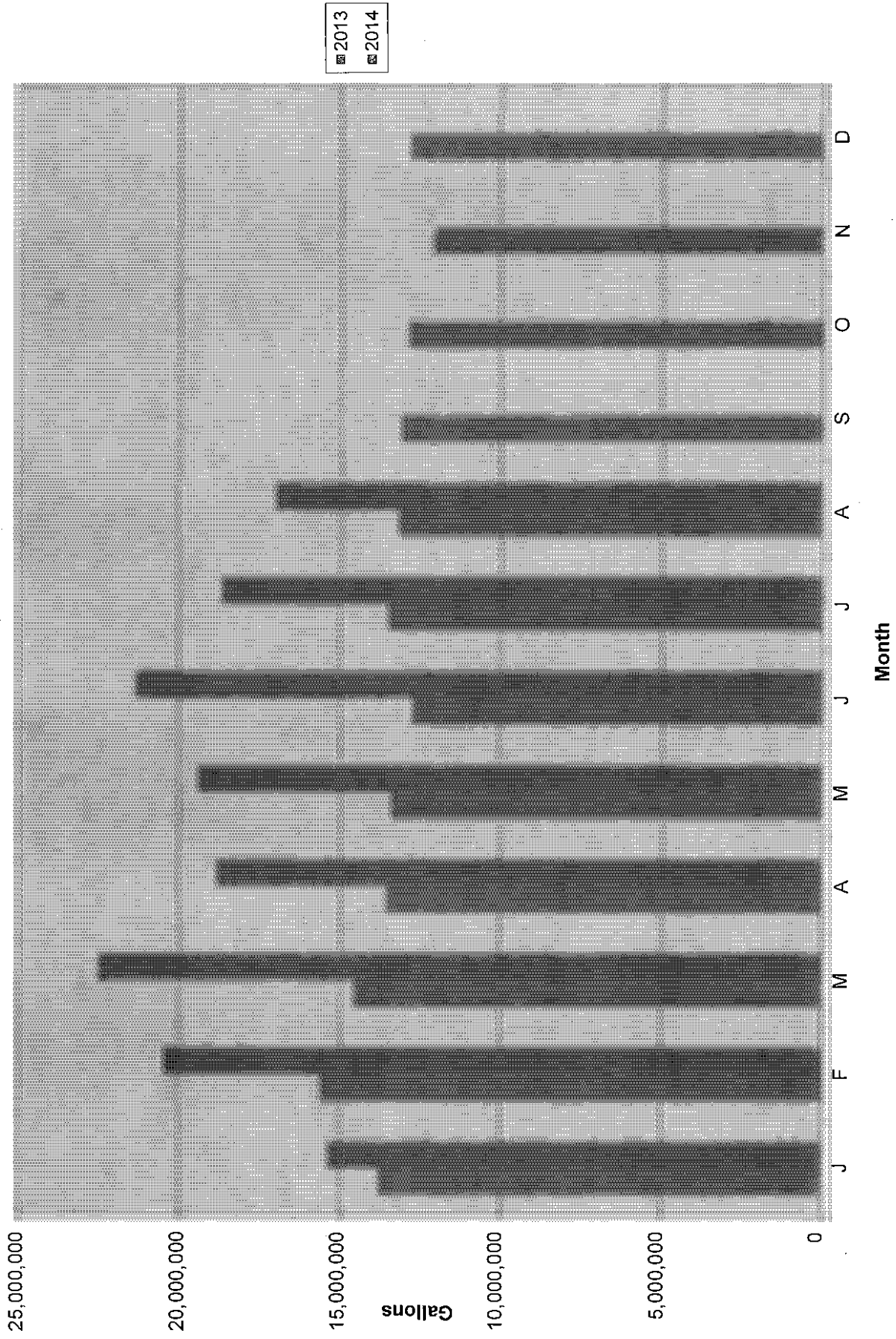
In April 2013, the City of Flint notified DWSD that it would be terminating service in the future and contracting for raw water service from the Karegnondi Water Authority (KWA). Work on the KWA pipeline from Lake Huron broke ground in June 2013 and is expected to be completed with connection in late 2016.

In August 2013, Rowe Professional Services Company completed an engineering proposal for improvements to the City of Flint WTP that would allow continuous operation of the WTP utilizing the Flint River in lieu of continuing service from DWSD until completion of the KWA pipeline. In March 2014, the City of Flint entered into a Consent Agreement with the DEQ regarding the Flint WTP lime sludge facility. In April 2014, the DEQ issued a construction permit for improvements to the Flint WTP. On April 25, 2014 the City of Flint began continuous operation of the WTP, using water from the Flint River and discontinued the purchase of water from DWSD.

A BWA was issued from August 15–20, 2014, for a portion of the City of Flint due to localized detections of Total Coliform and E.Coli bacteria. Another BWA was issued from September 5-9, 2014, due to localized detections of Total coliform bacteria in the same and adjacent portions of the City of Flint. The advisory covered an area approximately 6 square miles. The City of Flint has a total land area just over 34 square miles.

While many of the BWA contributing factors listed above require long term solutions, the City has taken operational steps to limit the potential for a BWA to reoccur. The City has increased flushing of water mains to limit residence time, maintain disinfectant residual, and help remove buildup and deposits within the piping. The City is boosting chlorine disinfectant residual at locations in the distribution system as needed. The City continues to investigate water leaks, water main breaks, and the status and condition of system valves.

City of Flint Monthly Averages



	OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE POLICY AND PROCEDURE		DEPARTMENT OF ENVIRONMENTAL QUALITY
Original Effective Date: October 12, 2007 Revised Date:	Subject: Guidelines for Issuing Boil Water Advisories to Address Potential Microbial Contamination of Community Water Supplies Division/Office and Program Names: ODWMA-Public Water System Supervision Program		Category: ☐ Internal/Administrative ☐ External/Noninterpretive ☒ External/Interpretive
Reformatted Date: January 24, 2013	Number: ODWMA-399-022	Page: 1 of 10	

A Department of Environmental Quality (DEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the DEQ. This document provides direction to DEQ staff regarding the implementation of rules and laws administered by the DEQ. It is merely explanatory; does not affect the rights of, or procedures and practices available to, the public; and does not have the force and effect of law.

INTRODUCTION, PURPOSE, OR ISSUE:

Community water systems are expected to provide customers with a continuous supply of water that meets both federal and state drinking water standards. However, there may be circumstances when the public must be notified that the water may not be safe. In these circumstances, a boil water advisory may be issued to prevent illness from known or suspected microbiological contamination. This policy is to provide guidance to Office of Drinking Water and Municipal Assistance (ODWMA) drinking water program staff on advising community water system personnel when to issue and rescind a boil water advisory, the appropriate content, and the manner and method of delivery.

AUTHORITY:

Administrative rule R 325.10401a promulgated under the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), being Michigan Compiled Law 325.1001 *et seq.*, requires public notification for violations of maximum contaminant levels and treatment techniques plus other situations as determined by the DEQ. Each public notice is required to state what actions consumers should take during a violation, which may include a statement recommending water customers boil all water used for consumption until further notice.

In addition, R 325.11207 allows the DEQ to require the supplier of water to provide notice to customers or users that include any precautionary measures deemed necessary when an interruption in water service occurs, which could include low, zero, or negative pressure events.

Furthermore, R 325.12303 requires a supplier of water to include in their contingency planning a description of precautions or measures to be taken to protect the health of those customers or users that may be affected by an emergency. R 325.12304 also requires a supplier of water to notify the DEQ when an emergency is discovered and how the supply will notify its customers or users. While the content of this notification to customers or users may vary depending upon individual circumstances, each notification to customers or users must state what actions or precautions they should take, which may include a statement to boil all water used for consumption until further notice.

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STAKEHOLDER INVOLVEMENT:

DEQ staff met with Municipal Utilities Directors to seek input on issues that were subsequently addressed in this policy and procedure.

DEFINITIONS:

"Boil Water Advisory (BWA)" – A written or verbal advisory issued by the community water system or DEQ notifying the users of the water system that the water is or may be contaminated and advising them to boil the water prior to using it for drinking or cooking.

"Community Water Supply (CWS)" – A public water supply (PWS) that provides year-round service to not fewer than 15 living units, or that regularly provides year-round service to not fewer than 25 residents. Examples include municipalities, such as cities, villages, and townships; apartment complexes; manufactured housing communities; condominiums; and nursing homes.

"Complete Loss of Pressure" – Sustained negative pressures or pressure below five psi in any portion of a distribution system. It does not include instantaneous low or negative pressure occurring from pressure surges caused by pump cycling, valve operation, or other water hammer events.

"Maximum Contaminant Level (MCL)" – The maximum permissible level of a contaminant in water that is delivered to any user of a PWS.

"Repeat Sample" – A sample that is collected and analyzed in response to a previous coliform-positive sample.

"Routine Sample" – A water sample that is collected and analyzed to meet the monitoring requirements for total coliform, as outlined in the written sampling plan.

"Tier 1 Public Notice" – A public notice required to be provided as soon as practical but not later than 24 hours after the supplier learns of a violation or situation that has significant potential to have serious adverse effects on human health as a result of short-term exposure. A Tier 1 Public Notice also requires the supplier to initiate consultation with the DEQ as soon as practical but not later than 24 hours after the supplier learns of the violation or situation. Examples of these violations or situations include:

1. A violation of the Total Coliform MCL when fecal or *E.coli* are present in the distribution system;
2. A violation of the treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit;
3. An occurrence of a waterborne disease outbreak;
4. A failure or significant interruption in key water treatment processes;
5. A disruption of the water supply or distribution system; and

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6. Other violations or situations as determined by the DEQ on a case-by-case basis. A violation or situation that requires a Tier 1 Public Notice also requires the supplier to consult with the DEQ to determine additional public notice requirements, including the timing, form, manner, frequency and content of the notice designed to reach all persons served, and any repeat notices or directions. At a minimum, one or more of the following forms of delivery must be used:
- a. Appropriate broadcast media;
 - b. Posting of the notice in conspicuous locations throughout the area served by the system;
 - c. Hand delivery of the notice to persons served by the system; or
 - d. Another delivery method approved by the DEQ.

Within 10 days of completing the Tier 1 Public Notice, the supplier shall submit to the DEQ a certification that it fully complied with the public notification requirements, including a representative copy of the type of notice distributed to persons served by the system and to the media.

"Tier 2 Public Notice" – A public notice required to be provided as soon as practical but not later than 30 days after the supplier learns of a violation or situation that has the potential to have serious adverse effects on human health. Examples of these violations or situations include:

1. All violations of MCL, maximum residual disinfectant level, and treatment technique requirements except where the DEQ determines a Tier 1 notice is required.
2. Violations of monitoring and testing procedure requirements, taking into account potential health impacts and persistence of the violation; and
3. Failure to comply with a variance or exemption.

For a Tier 2 Public Notice, the DEQ may, on a case-by-case basis, grant extensions in writing for up to three months from the date the supplier learns of the violation or situation, for reasons such as coordinating with billing cycles or if the violation or situation was quickly resolved and no longer poses any risk to the persons served. A Tier 2 Public Notice shall be repeated every three months as long as the violation or situation exists. A Tier 2 Public Notice and any repeat notices shall be in a form and issued in a manner that is reasonably calculated to reach persons served in the required time period. At a minimum, the notice shall be provided:

1. By mail or direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the supplier, and
2. By other methods reasonably calculated to reach other persons not receiving a bill, such as apartment dwellers, university students, nursing home patients and prison inmates. Other methods may include:
 - a. Publication in a local newspaper
 - b. Delivery of multiple copies to apartment complexes and manufactured housing communities
 - c. Posting in public places or on the Internet
 - d. Delivery to community organizations

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"Treatment Technique (TT)" – Minimum treatment requirement or a necessary methodology or technology that is employed by a supplier of water for the control of the chemical, physical, biological, or radiological characteristics of a PWS.

POLICY:

A BWA may be issued for a variety of reasons when microbial contamination is known or suspected. Total Coliform Rule (TCR) MCL violations, surface water TT violations, low or loss of pressure events, and waterborne disease outbreaks are circumstances when a BWA may be issued. Each of these situations is discussed in detail below. However, these situations are not the only times a BWA can or should be issued. Each incident must be handled on a case-by-case basis, using professional judgment to evaluate the circumstances in each situation.

Finally, there may be situations when water systems experience contamination that is not microbial, but chemical due to a chemical spill or backflow due to a cross connection. In these cases, a notice to customers could include "Do Not Use" language since boiling the water may not remove the contamination.

Types of Incidents:

1. Violation of a Drinking Water Standard

a. TCR MCL Violations

An acute TCR MCL violation occurs when monitoring indicates the presence of coliform organisms in both a routine and a follow-up repeat sample in the same monitoring period, and either analysis (routine or repeat) is also positive for fecal or *E.coli*. Because this MCL violation confirms the presence of a more direct connection to contamination, these violations warrant issuance of a BWA, unless there are unique circumstances.

A non-acute TCR MCL violation occurs when monitoring indicates the presence of coliform bacteria in 2 or more samples in the same monitoring period for a supplier collecting less than 40 samples per month, or in more than 5 percent of the samples for a supplier collecting 40 or more samples per month, and the criteria for an acute violation did not occur, i.e., fecal coliform or *E.coli* were NOT detected present in either a routine or repeat sample. For example, a system that collects 5 samples per week for a total of 20 per month may have 1 sample report positive for total coliform or fecal/*E.coli* during the first week, but all repeat samples report negative for coliform. If another sample in a subsequent week also reports total or fecal/*E.coli* positive, but again, all repeat samples are coliform-negative, then a non-acute TCR MCL violation has occurred because 2 or more samples reported positive for coliform, but no fecal coliform or *E.coli* were detected in both a routine and a repeat sample.

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When a non-acute violation occurs, staff should evaluate possible sources of contamination. If a source is identified that is considered likely to contribute disease causing organisms or result in water of questionable quality still being distributed, a BWA should be instituted. Examples of contaminant sources that would elevate the public health risk include, but are not limited to:

- flooding of the wells
- failure of the treatment system
- recent construction activity in the distribution system
- vermin (birds, rodents, etc.) activity in storage tanks
- system-wide or extensive pressure loss in the distribution system

Even if the source of contamination is not easily identified, a BWA may be appropriate for a non-acute TCR violation if the violation is widespread or ongoing. A BWA shall be instituted if monitoring indicates *E. coli* or fecal coliform contamination unless unusual circumstances warrant consideration, such as the absence of any coliform in repeat samples, or when staff are assured that the contamination has been eliminated before confirmation results are available.

However, not every TCR MCL violation must result in a BWA. There may be a few exceptions when there is a TCR MCL violation but a BWA is not needed. For example, a violation may be declared in situations where samples collected on different days from widely dispersed locations report coliform present even though repeat samples do not show positive results. In this case, the sampling results may constitute a MCL violation, but a BWA may not be necessary.

If a BWA is deemed necessary by the ODWMA, it should be issued as soon as possible but no later than 24 hours after the system learns of the violation. Because violation of an MCL results in required public notification (PN) per the PN Rule, the water supply may issue the PN and BWA simultaneously in one document (highly recommended) and must meet all the requirements of a Tier 1 PN and include BWA language.

After measures have been taken to eliminate the source(s) of contamination, such as initiating or increasing chlorine feed rates and system flushing, additional sampling must be conducted. Raw water bacteriological sampling is also encouraged to eliminate the raw water as the possible source of contamination. For MCL violations, the BWA can be rescinded after the analyses of two sets of samples collected 24 hours apart report the absence of coliform bacteria. The number of samples in each set should be a minimum of five samples, but can be decreased or increased based on system size or the extent of the affected area. Systems are encouraged to use routine sample sites if available and to use extra care if routine sites are not available.

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b. Surface Water Treatment Rule (SWTR) TT Violations

SWTR TT violations include:

- exceedance of turbidity standards at filter confluence point
- failure to meet disinfection contact time requirements (C*T)
- failure to meet disinfection residual standards

Upon determination of an SWTR TT violation, ODWMA staff must determine if the violation poses a threat to public health. For example, if the turbidity levels at the filter confluence point were found to have exceeded 0.3 nephelometric turbidity units (NTUs) in 95 percent of the samples in a two-month period, an SWTR TT violation has occurred. Based upon a review of plant performance and consultation with program managers, staff may determine that no significant health risk was posed and no BWA is necessary. However, the water supply must still issue a Tier 2 PN within 30 days of the violation. On the other hand, a BWA is likely to be necessary for a treatment plant that gets overwhelmed by excessive runoff and reports a turbidity level in excess of 1.0 NTU at the filter confluence point for a four-hour period.

If the TT violation is ongoing or prolonged, or the ODWMA determines a significant public health risk is posed, ODWMA staff may elevate the PN to Tier 1 status, which must be issued within 24 hours and include BWA language. After appropriate measures have been taken to reduce or eliminate any health risk, additional monitoring must be conducted. Appropriate measures may include increasing coagulant dose, increasing chlorine residuals through the treatment plant, backwashing filters more often and flushing key system components. In this case, a BWA can be rescinded after analyses of two sets of samples collected 24 hours apart report the absence of coliform bacteria. The number of samples in each set should be a minimum of five samples, but can be decreased or increased based on type and severity of the TT violation.

Surface water plants utilizing conventional or direct filtration must add a primary coagulant under R 325.11008. Failure to add a primary coagulant is a violation of Act 399, and may also contribute to a TT violation under R 325.10611 (Filtration and Disinfection) which requires 3-log inactivation of giardia and 4-log inactivation of viruses. In these cases, ODWMA staff will have to determine if the violation poses a threat to public health and whether other actions are necessary, such as requiring a BWA. Factors to consider if a BWA is necessary would include chlorine residual concentrations throughout the treatment plant, raw water quality, C*T compliance, plus individual filter effluent and combined filter effluent turbidity levels.

2. Waterborne Disease Outbreaks

Waterborne disease outbreaks can be declared by the Centers for Disease Control and Prevention, the Department of Community Health, a local health department, or other public

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health institutions. If an outbreak is declared, the ODWMA will work with the declaring agency to ensure affected community public water supplies take appropriate measures to mitigate public exposure. These measures will include appropriate public notification, including instructions to boil water if appropriate. The ODWMA will allow the water supply to rescind the notification when the agency declaring the outbreak indicates it is safe to do so as the result of additional monitoring.

3. Interruptions in Service

a. Negative or Complete Loss of Pressure

A complete loss of pressure or negative pressure in the distribution system must result in a BWA being issued to all water customers in the impacted area. After pressure is restored and the system recovers (tanks are filling and enough sources are operating to ensure pressures do not drop again), the affected area should be thoroughly flushed and coliform samples must be taken throughout the area to determine if the distribution system remains free of coliform contamination. The number of samples will vary depending on the size of the system and the extent of the area impacted. For very small systems that experience a power failure that results in a complete loss of pressure throughout the distribution system, a minimum of three samples should be collected. If applicable, chlorine residual measurements should be taken to ensure that an adequate disinfectant residual is present. If possible, chlorine dosages and residuals should be increased by 1 to 2 parts per million during this period as a corrective and preventive measure. If the first round of sampling does not detect coliform bacteria, the advisory may be rescinded. However, if the first round of sampling detects coliform bacteria, additional flushing should be conducted in the area where the positive coliform samples were collected and a second round of coliform samples collected from the area. The BWA should remain in effect until safe coliform sample results are obtained.

b. Low Pressure Events

Low pressure events might not result in a BWA. Low pressure is considered a drop in pressure below 20 psi but greater than 5 psi. A drop in water pressure in a distribution system could allow contamination to enter the water system through backflow by backpressure or backsiphonage. The decision to issue a BWA should be made on a case-by-case basis and be based upon professional judgment of all available data that may indicate the extent of the problem, such as:

- Geographical extent of the pressure loss
- Nature of the service area (residential vs. commercial/industrial)
- Duration of the low pressure condition
- Disinfection practices of the water system
- Relative elevation differences in the service area
- Status of the local cross connection control program

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- Age and condition of the underground piping
- Amount of underground piping located in areas of a high groundwater table
- Ability and willingness of the operators to rapidly apply chlorine to the system or distribute an increased chlorine residual throughout the affected area

After normal pressure is restored, the impacted area should be thoroughly flushed and coliform samples taken throughout the area to determine if the distribution system is free of any bacteriological contamination. The collection of coliform samples after low pressure events is not absolutely required, but may be recommended based on the factors above.

c. Water Main Breaks or Repairs

A BWA may be issued during water main breaks and after the break has been repaired. Whether or not to issue a BWA will depend on the location and severity of the break and, more importantly, a decision based on sound engineering judgment that the integrity of the water system has been maintained. If at all possible, repairs should be performed under reduced or low pressure by closing the closest valves on each side of the break just enough to reduce the flow so the repairs can be made under pressure while the water flowing from the break is diverted away from the excavation to maintain clean sanitary conditions. If the water main can be repaired under pressure, and no nonpotable water, soil, or other potential contaminants entered the main during the break and repair process, then a BWA is not necessary. If the water main that was removed from service is flushed, disinfected, and sampled in accordance with AWWA Standard C651 before being placed back into service, a BWA does not need to be issued.

If a water main break results in a complete loss of pressure before, during, or after the repair is made, a BWA must be issued to all customers in the affected area. The BWA should remain in effect until the area is flushed, chlorine residuals are reestablished (if applicable), and sample results do not detect coliform bacteria.

Content and Delivery of a BWA

If the ODWMA determines a BWA is necessary, the water supply must issue the advisory as soon as practical, but not later than 24 hours after being advised to do so. The supply must make a good faith attempt to notify all customers in the affected area. Appropriate methods of distribution are situation specific, but may include radio or television broadcasts, hand delivery, and/or posting in conspicuous locations throughout the area. Delivery requirements as detailed in the PN Rule should be used to determine appropriate delivery methods.

Although there are content requirements for public notification under the PN Rule, there are no requirements specific to boil water language. To ensure all appropriate information is transmitted to the customers, a BWA should include the same content elements as required for

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public notification under the PN Rule. If a BWA is issued as the result of an MCL violation and the water supply issues the BWA in conjunction with the required PN (highly recommended), the content **MUST** meet all PN Rule content, delivery, and reporting requirements.

The ODWMA boil water language is consistent with the U.S. Environmental Protection Agency policy that requires water be brought to a boil and allowed to boil for one minute before use. The language also suggests the use of bottled water as an alternative to boiling and describes the circumstances under which boiled or bottled water should be used.

Staff should notify the appropriate local health department and the Department of Agriculture and Rural Development, Food and Dairy Division, whenever a BWA is issued or rescinded. These agencies may receive calls from concerned customers or be involved in oversight of facilities impacted by the boil advisory and, therefore, need to be aware of the situation.

Several BWA templates have been created and are available to ODWMA staff on the DEQ Intranet. To ensure consistency and inclusion of all necessary content, these templates should be used as the basis for PNs and/or a BWA. Available templates include, but are not limited to:

- Advisory for a TCR MCL.
- Advisory for a low/no pressure event.
- Notification for cancellation of a BWA.

PROCEDURES:

WHO	DOES WHAT
Public Water Supply	Notify DEQ of results in a timely manner as required by law and follow through with appropriate actions.
District Staff	Respond to all TCR and TT violations plus complete loss of pressure events in a timely manner and determine whether a BWA needs to be issued. • If needed, assist supply in drafting BWA and determining most appropriate method of delivery with approval from the District Supervisor. • If needed, assist the supply in determining actions to remove the possible contamination including steps needed to rescind the BWA.
District Staff	Provide <u>on-site</u> technical assistance for acute TCR MCL violations and other boil water situations as appropriate.
District Supervisors	Assist District Staff in the all matters pertaining to issuing a BWA.

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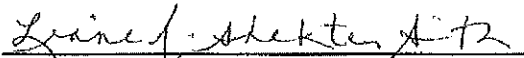
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REFERENCES:

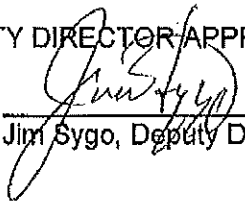
Safe Drinking Water Act, 1976 PA 399, as amended, being Michigan Compiled Law 325.1001 *et seq.*, and the administrative rules promulgated thereunder, being R 325.10101 *et seq.* of the Michigan Administrative Code.

OFFICE CHIEF APPROVAL:


Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance

1/18/2013
Date

DEPUTY DIRECTOR APPROVAL:


Jim Sygo, Deputy Director

1/24/2013
Date

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, January 21, 2015 10:52 AM
To: prysbym@michigan.gov
Subject: Draft Presentation
Attachments: FlintPublicMeeting-DEQ.pptx

See attached draft.

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

Community Water Supply

Information Regarding
Total Trihalomethane (TTHM)
Disinfection Byproducts

DEQ - Community Water Supply

- Regulatory Authority over Public Water Systems
- Michigan Safe Drinking Water Act
- 1400 Community Supplies in MI (like Flint)
- Lansing Jackson Districts – 300 in 13 counties
- Oversight through:
 - Inspection
 - Monitoring
 - Construction Permitting
 - Planning
- Partnership and Compliance Assistance

What are TTHM's

Trihalomethanes occur when natural organic matter in the water react with chlorine disinfectants.
(Byproduct of disinfection process)

4 Chemical Compounds made up of these elements:

- Carbon
- Hydrogen
- Bromine
- Chlorine

TTHM Standard

- Based on chronic exposure to low doses
- 80 parts per billion (0.080 ppm)
- Locational Running Annual Average (LRAA)
- Quarterly monitoring at each location
- Location and timing based on highest risk
- Running = over last 4 quarters, not calendar yr
- Total sum of 4 quarters not to exceed 320 ppb

Flint TTHM Results

TTHM Results (mg/L)					
	5/21/14	8/21/14	11/20/14	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.162	0.145	0.059	0.092	0.106
DBP2 Liquor Palace 3302 S. Dort Highway	0.112	0.127	0.033	0.068	0.076
DBP3 North Flint Auto 6204 N. Saginaw St.	0.097	0.118	0.041	0.064	0.074
DBP4 University Market 2501 Flushing Road	0.106	0.196	0.094	0.099	0.122
DBP5 Taco Bell 3606 Corunna Road	0.079	0.181	0.034	0.074	0.082
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.088	0.144	0.054	0.072	0.085
DBP7 Salem Housing 3216 MLK Boulevard	0.082	0.112	0.050	0.061	0.074
DBP8 BP Gas Station 822 S. Dort Highway	0.075	0.112	0.036	0.056	0.065

Potential Health Effects Related to TTHM

- Federal Language
- Some people who drink water containing TTHM in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and increased risk of cancer.

Health Effect Basis

- Toxicology Studies - Uncertainty in using results of high-dose studies in animals to estimate risk to humans from chronic exposure to low doses in drinking water
- Epidemiology – Findings are contradictory. No conclusion of causal link between exposure and health effects.
- EPA determined evidence supports a potential hazard concern and establishment of standard.
- Considered best course of action at this time to reduce potential risks.

TTHM Violation Requirements

- Water supply must take steps to reduce the amount of TTHM so that they are below the standard.
- Water supply must notify customers of the violation within 30 days of after learning of the violation.

Operational Evaluation

- System treatment practices
- System distribution practices
- Storage tank operations
- Excess storage capacity
- Distribution system flushing
- Source water quality
- Treatment changes
- TTHM contributions
- Steps to minimize future standard violations

Public Notification

- Designed to provide

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, September 24, 2015 11:25 AM
To: Richard Benzie P.E. (BENZIER@michigan.gov); cookp@michigan.gov
Subject: Draft response language

See my draft response below. I would like to include someone from EPA that is working on the LCR as a cc on this so they are aware of what this individual is asking.

I'm sorry for the delay in my response. As some of your questions relate more to statewide program implementation I have requested assistance with the response from staff within our central program office. However, these staff were attending and participating in our American Water Works Association Conference Michigan Section conference last week.

Michigan has implemented an EPA approved modified consecutive system approach to lead and copper monitoring where a wholesale water supply sells water to other community water systems. In addition, while water quality parameter monitoring occurs at both the water treatment plant and in the combined distribution system, a water quality parameter range is only required to be established at the water treatment plant tap upon designation of having optimized corrosion control treatment.

Thus when the City of Flint was a customer of the Detroit Water and Sewerage Department (DWSD), the City of Flint participated in water quality parameter monitoring of its distribution system, but ranges were established only for the OCCT at DWSD treatment plants. The attached letter from our Department established the minimum levels for pH and phosphate dosage in 2000.

As the City of Flint water treatment plant has not yet installed such treatment or been given the designation of OCCT as a separate water system these plant tap values have not been established.

However, the City of Flint WTP has continued to maintain the minimum pH value requirement previously established for DWSD

As noted in your Working Group Report to the NDWAC, "Corrosion Control Treatment (CCT) involves the addition of chemicals (e.g. orthophosphates or silicate) to create a barrier between the pipes and the drinking water, or to modify drinking water chemistry (such as pH and hardness) to inhibit the potential for corrosion."

Should the Flint WTP softening process be considered to be OCCT, then the City already continues to comply with the OCCT requirements as the City of Flint has never had 10% or more of compliance tap samples exceed the 15 ppb action level. Even prior to DWSD's established OCCT the City of Flint has never exceeded the 15 ppb action level.

If you have additional questions we would appreciate having them routed through the NDWAC and your Working Group. Thanks.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, December 10, 2014 5:10 PM
To: 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Datema, Maggie (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)
Subject: Draft Violation Notice for comment
Attachments: Flint DBP MCL 4Q14 draft.doc

Attached is a draft violation notice to the City of Flint regarding the exceedance of the drinking water standard for total trihalomethanes (TTHM).

If you have any comments please let me know by Friday, we would like to mail this out by Monday at the latest. An electronic copy of the signed letter will be provided to Maggie for forwarding to legislative members in the Flint area.

If you have any questions, please contact me directly.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

December 12, 2014

Mr. Brent Wright, Operation Supervisor
City Of Flint - DPW
Flint Water Plant
4500 North Dort Highway
Flint, MI 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice – Maximum Contaminant Level for Total Trihalomethanes
Operational Evaluation – Total Trihalomethanes
3rd Quarter 2014

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels (MCL) for disinfection byproducts*, of the 1979 Administrative Code.

In accordance with R.325.10610, *MCLs for disinfection byproducts*, of the 1979 Administrative Code, the MCL for disinfection byproduct total trihalomethanes (TTHM) is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City of Flint's highest TTHM locational running annual average (LRAA), based on the last three quarters ending November 30, 2014, is 0.099 mg/l which exceeds the standard, and that two of the eight sample site locations exceed the standard of 0.080 mg/L.

Further, in accordance with R325.10719I, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, when an operational evaluation level (OEL) at a monitoring location for TTHM exceeds 0.080 mg/L, a supply shall conduct an operational evaluation and submit a written report of the evaluation to the department not later than 90 days after being notified of the analytical result that causes the supply to exceed the operational evaluation level. As listed in the table below, our records show that TTHM operational evaluation levels for the City of Flint exceed 0.080 mg/L, at four of the City's eight sample site locations.

TTHM Results (mg/L)					
	5/21/14	8/21/14	11/20/14	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.162	0.145	0.059	0.092	0.106
DBP2 Liquor Palace 3302 S. Dort Highway	0.112	0.127	0.033	0.068	0.076
DBP3 North Flint Auto 6204 N. Saginaw St.	0.097	0.118	0.041	0.064	0.074

DBP4 University Market 2501 Flushing Road	0.106	0.196	0.094	0.099	0.122
DBP5 Taco Bell 3606 Corunna Road	0.079	0.181	0.034	0.074	0.082
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.088	0.144	0.054	0.072	0.085
DBP7 Salem Housing 3216 MLK Boulevard	0.082	0.112	0.050	0.061	0.074
DBP8 BP Gas Station 822 S. Dort Highway	0.075	0.112	0.036	0.056	0.065

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on December 1, 2014, and will continue until TTHM LRAA is below the MCL at all sample sites.

Water systems who exceed the OEL must complete and submit an Operational Evaluation in accordance with Administrative Rule 7191(R325.10719I) within 90 days since the start of the violation. The Operational Evaluation must identify possible causes and corrective measures for the elevated TTHM levels. The Operational Evaluation must be completed and received by our office by no later than March 1, 2015.

If you have any factual information you would like us to consider regarding the violation identified in this Notice, please provide them in a written response by January 12, 2015.

Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice as soon as practical but no later than thirty (30) days after the supplier learns of the violation, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample public notice (PN) which contains the minimum required language. The City is encouraged to provide additional information regarding its response to this violation. **Please notify your consumers by January 10, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the public notice.** This violation must be included in your Consumer Confidence Report (CCR,) due by July 1, 2015. The public notification must be repeated every quarter until you no longer exceed the TTHM standard. **Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.** Contact our office for a more complete summary of our fines policies.

We anticipate and appreciate your cooperation in resolving this matter. If you have any questions regarding this Violation Notice, please contact us at the numbers below.

Sincerely,

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

Adam Rosenthal, EQA
Lansing District Office
Office of Drinking Water & Municipal

Assistance
517-290-8817

Assistance
517-284-6644

MFP:AR:JR

Enclosure

cc:

Genesee County Health Dept.
Jennifer Crooks, EPA Region 5
Mr. Darnell Early, Emergency Manager, City of Flint
Daughtry Johnson
Howard Croft
Robert Bincsik
Liane Shekter Smith, P.E.
Richard Benzie, P.E.
Stephen Busch, P.E.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, and November 20 of 2014). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the MCL. The standard for TTHMs is 80 µg/L. The location reporting the highest TTHM level was 99 ug/L; thus, our water system exceeds the TTHM MCL.

What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem by 2015.

For more information, please contact Mr. Brent Wright at 517-787-6537 or the Flint Water Plant at 4500 North Dort Highway, Flint, MI 48505.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by the City of Flint.

CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, September 29, 2014 12:18 PM
To: Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov
Cc: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Subject: Flint - Governor Briefing - 1st Draft
Attachments: Governor Briefing - Flint-1stDraft.docx

Attached is a 1st draft of the briefing to the Governor's Office regarding the City of Flint water system as requested by Director Wyant following our meeting on 9/25.

I have managed to keep it to less than 2 pages while including, I think, all the talking points we discussed with the Director.

Please review the draft and provide me any comments by COB today. I need to get the final draft to the Director by COB on Tuesday as I will be out the rest of the week.

Mike, please take a look and confirm some of the numbers we have (WM miles, valves, etc.). The City's recent BWA report appeared to have some different numbers and I want to be sure our numbers are still accurate. Also let me know if there are any other confirmed steps the City is taking to proactively prevent additional BWA's from occurring.

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

MDEQ - Governor's Office Briefing - City of Flint Drinking Water (1st draft)

What contributed to the Boil Water Advisories in the City of Flint?

A number of factors, not one specific cause, likely contributed to the Boil Water Advisories (BWA's) in the City of Flint during August and September 2014. While use of the Flint River has increased the amount of natural organic matter in the City's water, the City's water treatment plant (WTP) has performed well above treatment requirements for organic carbon removal. In addition, less than 20% of the water system was included in the advisory area. If treatment had been compromised, detections would have been widespread throughout the City, rather than in such a localized area.

The City's water distribution system has suffered from a lack of infrastructure investment and asset management. Most of the City's over 570 miles of water mains are now over 75 years old, and constructed of cast iron piping. Cast iron pipe is subject to internal corrosion, tuberculation, which causes buildup on the pipe interior leading to water quality issues, reduced flow and pressures, and leakage. Tuberculation also encourages the development of biofilms, layers of bacteria that attach to the interior pipe wall. Present in almost every water system, biofilm when uncontrolled may present a threat to public health. Biofilm growth, together with tuberculation can clog water lines to the point of insufficient water pressure.

The City has also experienced decades of a declining user base along with vacant homes, commercial businesses and industrial property. This leads to excess residence time within the City's distribution pipes and water storage facilities, accelerating both tuberculation and biofilm growth. While the City has recently seen an infusion of funding for blight removal, contractors completing this work have been found improperly using fire hydrants, causing hydraulic disturbances which may also have contributed to the contamination.

The winter of 2014 was also one of the coldest experienced by the water system. The City which historically has unaccounted water losses of over 30% has seen even greater losses since February due to an increase in cold weather related water main breaks and leaks. The over 7,250 valves normally used to limit impacts during break repairs, lack a formal maintenance program. Two valves on the transmission line used to supply the area of the BWA were found to be closed during the City's investigation, causing longer residence time, reduced flow, and reduced pressure. One of these valves has remained broken.

The BWA's also occurred during the warmest and for 2014 relatively wet periods of August and September. Warm weather conditions are not only more conducive to bacterial growth but also degrade the water's disinfectant residual carried out from the WTP more quickly. Longer residence times, biofilms, and tuberculation also contribute to disinfectant residual degradation. Warm wet weather conditions also allow water contaminated with bacteria to pool around piping with leaks and breaks.

Process for Issuance and Cancelation of a Boil Water Advisory

There are a number of conditions that can trigger boil water advisories. This includes the following:

- Bacteria Monitoring Detections
- Bacteria Standards Violations
- Treatment System Failures
- Waterborne Disease Outbreaks
- Loss of System Pressure
- Water Main Breaks
- Other Interruptions in Service

The DEQ has developed a policy regarding BWAs under to help guide staff, provide consistency, and maintain public health. A copy of the policy is attached.

BWA's may be self-initiated by the water system, issued collaboratively in consultation with the DEQ, or when necessary through mandate by the DEQ. Requesting customers to boil the water when bacterial contamination has occurred provides an added barrier of public health protection.

The BWA's which recently occurred in the City of Flint were associated with bacteria monitoring detections and violations of bacteria standards. These advisories were issued in a collaborative manner by the City of Flint in consultation with the DEQ.

Current regulations regarding monitoring and standards for bacteria in water distribution systems were developed by the EPA, have been in effect since 1990, and incorporated into the Michigan Safe Drinking Water Act. There are a variety of bacteria, parasites, and viruses which can potentially cause health problems if humans ingest them in drinking water. Testing water for each of these potential pathogens would be difficult and expensive. Instead, water systems test for Total coliform and E.coli. Total coliform bacteria react to water treatment in a manner similar to many pathogens. Therefore, the presence of total coliform in drinking water indicates there may be a pathway for pathogens or contaminants to enter the system. While the absence of total coliforms in the distribution system minimizes the likelihood that pathogens are present. E.Coli is itself a pathogen and its detection would be direct evidence of a health risk.

Once a BWA has been issued time is needed to investigate potential causes and implement corrective measures. The larger the water system, the more time this may take. Once corrective measures have been taken, samples must be collected and analyzed to confirm that bacteria are no longer present. Using the most common analytical method, samples must be incubated for a period of 24 hours before results can be obtained. In situations where the bacterial contamination has been confirmed, two consecutive rounds of safe samples collected at least 24 hours apart are normally obtained before canceling a BWA. Adding each of these steps together, a normal response period to cancel a BWA under these circumstances would be expected to take at least 3 to 4 days.

Recent History of City of Flint Water System

Historically the City of Flint had been a customer of the Detroit Water and Sewerage Department (DWSD) while simultaneously maintaining the City of Flint WTP to provide emergency backup service using the Flint River. The WTP performed quarterly test operations to maintain readiness and was utilized twice in 2009, supplying water once for 2 days and the other for 3 days.

In April 2013, the City of Flint notified DWSD that it would be terminating service in the future and contracting for raw water service from the Karegnondi Water Authority (KWA). Work on the KWA pipeline from Lake Huron broke ground in June 2013 and is expected to be completed with connection in late 2016.

In August 2013, Rowe Professional Services Company completed an engineering proposal for improvements to the City of Flint WTP that would allow continuous operation of the WTP utilizing the Flint River until completion of the KWA pipeline. In March 2014, the City of Flint entered into a Consent Agreement with the DEQ regarding the Flint WTP lime sludge facility. In April 2014, the DEQ issued a construction permit for improvements to the Flint WTP. On April 25, 2014 the City of Flint began continuous operation of the WTP, using water from the Flint River and discontinued the purchase of water from DWSD.

A BWA was issued from August 15–20, 2014, for a portion of the City of Flint due to localized detections of Total Coliform and E.Coli bacteria. Another BWA was issued from September 5-9, 2014, due to localized detections of Total coliform bacteria in the same and adjacent portions of the City of Flint. The advisory covered an area approximately 6 square miles. The City of Flint has a total land area just over 34 square miles.

While many of the BWA contributing factors listed above require long term solutions, the City has taken operational steps to limit the potential for a BWA to reoccur. The City has increased flushing of water mains to limit residence time, maintain disinfectant residual, and help remove buildup and deposits within the piping. The City is boosting chlorine disinfectant residual at locations in the distribution system as needed. The City continues to investigate water leaks, water main breaks, and the status and condition of system valves.

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, October 20, 2015 2:31 PM
To: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: FW: Flint WTP PH2 SEG4 - Corrosion Control
Attachments: Flint WTP PH2 S4 - Corrosion Control.pdf

Samir's updated proposal sent Friday nite...

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

From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]
Sent: Monday, October 19, 2015 12:18 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

Please see attached updated plans for the Corrosion Control Plan for the City of Flint. These plans matches the set of plans that was submitted to your office in hard copies on Friday. This submittal is somewhat modified from the set that was submitted to you on Thursday night/Friday morning.

We will address the questions you raised and respond on Monday.

Please let me know if there are other comments that needs our attention.

Thanks for your prompt and quick response to our submittal.

Samir F. Matta, PE
 Team Leader



**Lockwood, Andrews
& Newnam, Inc.**
 A LEO A DALY COMPANY

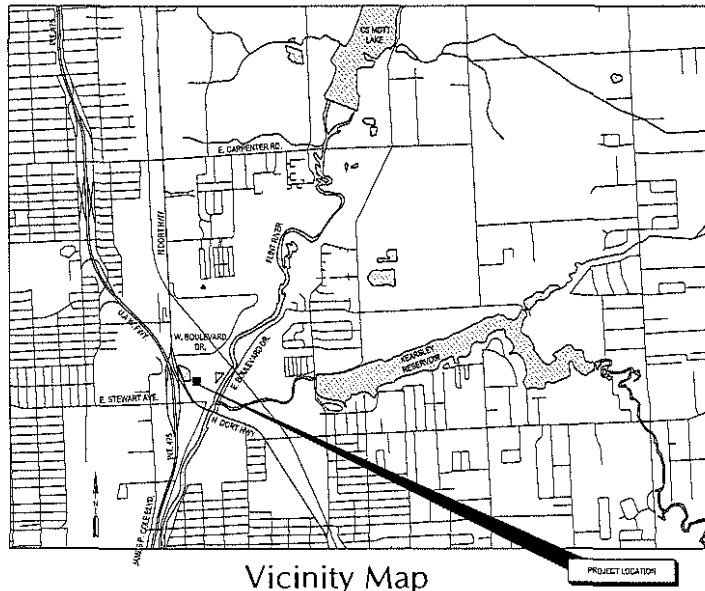
1311 South Linden Road, Suite B • Flint, MI 48532
 2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
 D 517.819.2367 C 517.819.2367
www.lan-inc.com • sfmatta@lan-inc.com

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City of Flint, MI Flint Water Treatment Plant Phase II, Segment IV - Corrosion Control

4500 North Dort Highway, Flint, MI 48505



Vicinity Map

Jeremy N. Nakashima

10-16-2015

Jeremy N. Nakashima, P.E. Date
Michigan Licensed Professional Engineer
No. 6201058535 Expires October 31, 2016



Issued for: Permitting
Issue Date: October 16, 2015

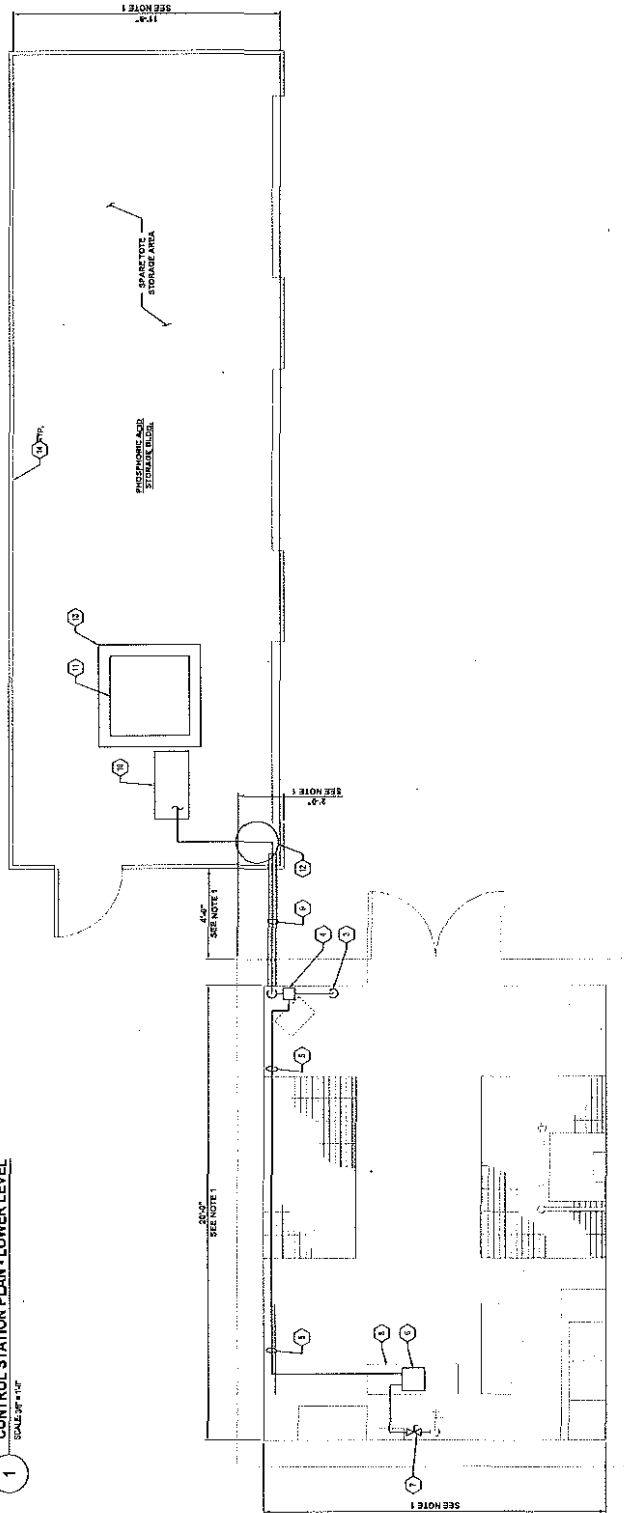


**Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY

PLANNING
ENGINEERING
PROGRAM MANAGEMENT

1311 South Linden Road, Suite B
Flint, MI 48532
Tel 810-820-2682 Fax 810-820-2703

2 CONTROL STATION PLAN - GRADE LEVEL
SCALE: 3/8" = 1'-0"



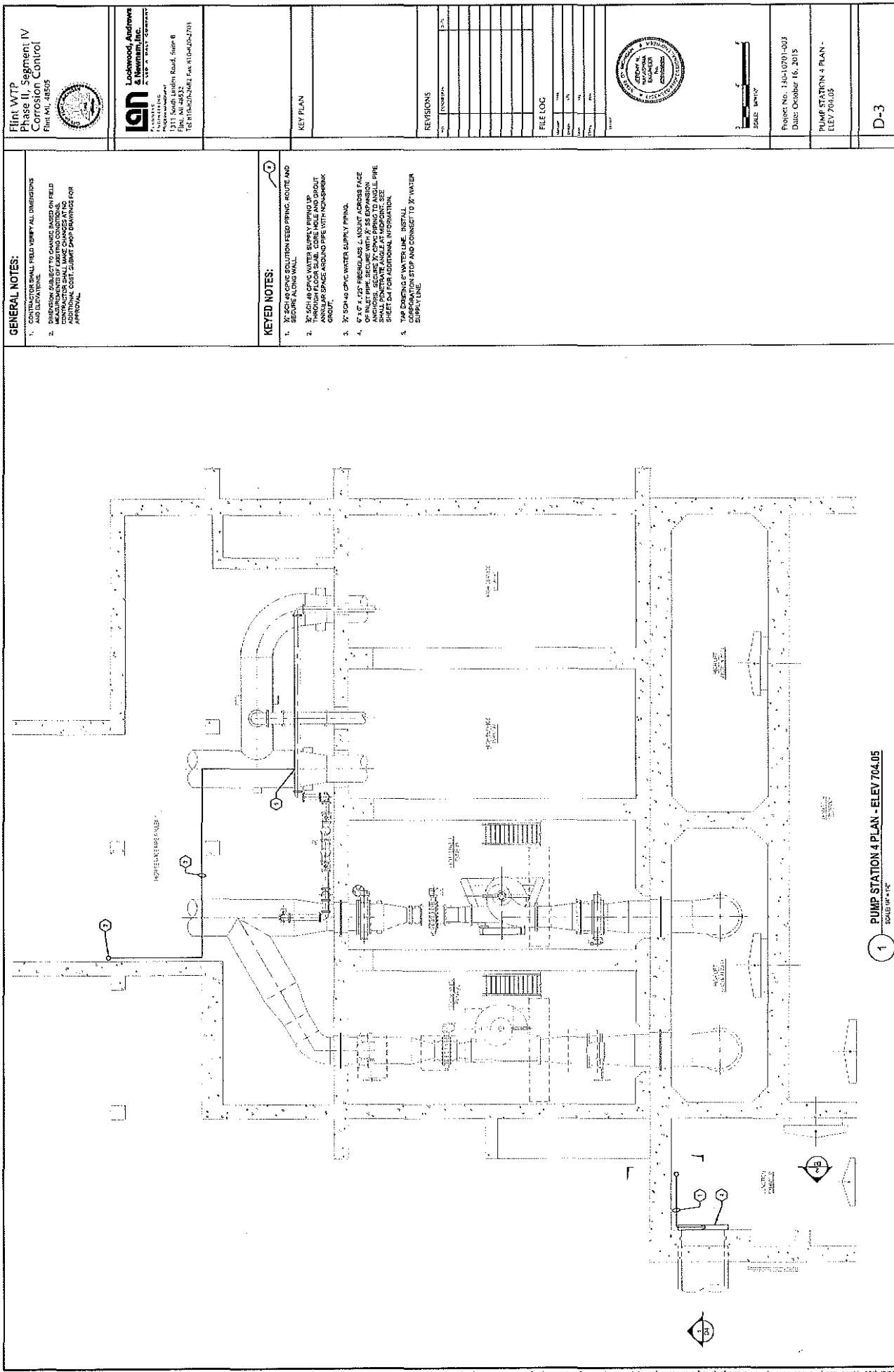
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GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. DIMENSIONS SUBJECT TO CHANGES BASED ON FIELD MEASUREMENTS OF EXISTING CONDITIONS.
3. CONTRACTOR SHALL MAKE CHANCES AT NO ADDITIONAL COST. SUBMIT SHOP DRAWINGS FOR APPROVAL.
4. ALL CPVC PIPE JOINTS SHALL BE SOLVENT WELD TYPE.
5. PROVIDE PIPE SUPPORTS MOUNTED OFF PUMP TABLE FOR ALL PIPING AT MATTERING NUMBER.

KEYED NOTES:

- [illegible]



GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. MEASUREMENTS SUBJECT TO CHANGE BASED ON FIELD MEASUREMENTS OF EXISTING CONDITIONS. CONTRACTOR SHALL MAKE CHANGES AT NO ADDITIONAL COST. SUBMIT SHOP DRAWINGS FOR APPROVAL.

KEYED NOTES:

1. 3/4" SCH 40 CPVC SOLUTION FEED PIPING, ROUTE AND SECURE ALONG WALL.
2. 3/4" SCH 40 CPVC WATER SUPPLY PIPING UP THROUGH FLOOR SLAB, CORE HOLE AND GROUT ANULAR SPACE AROUND PIPE WITH NON-SHRINK GROUT.
3. 3/4" SCH 40 CPVC WATER SUPPLY PIPING.
4. 6" x 6" x .075" PEX-BUCLASS 2, MOUNT ACROSS FACE OF WALL, SECURE WITH #8 EXPANSION ANCHORS. PIPING SHALL BE 1/2" FROM WALL. PIPE SHALL PENETRATE ANGLE AT MIDPOINT. SEE SHEET 04 FOR ADDITIONAL INFORMATION.
5. TAP DOWNING 6" WATER LINE, INSTALL SUPPLY LINE, STOP AND CONNECT TO 3/4" WATER SUPPLY LINE.

KEY PLAN

REVISIONS

[illegible]

2013

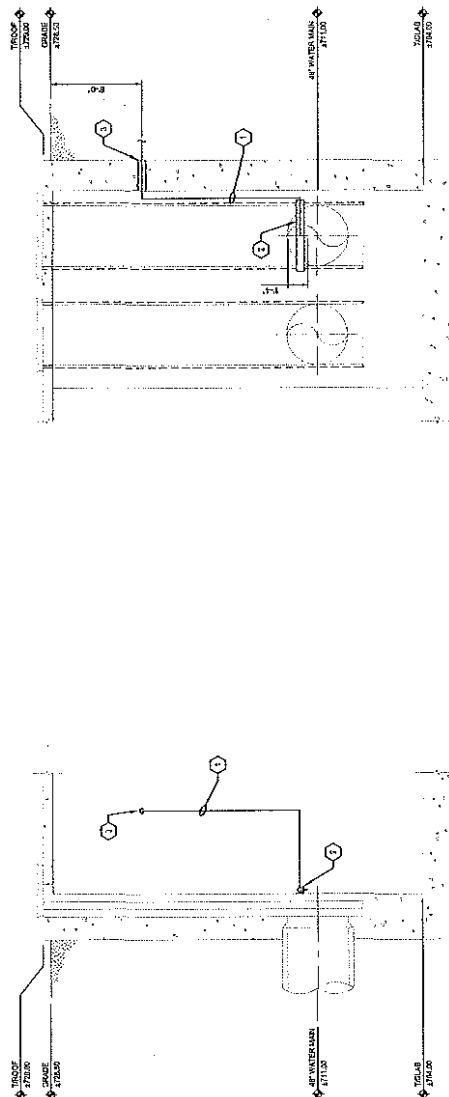
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Project No. 130-10701-003
Date: October 16, 2015

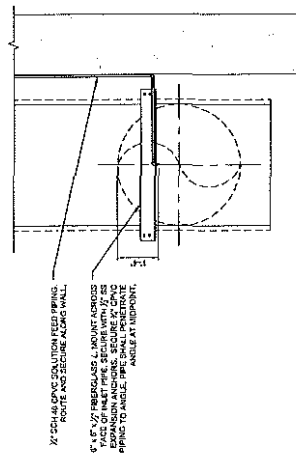
PUMP STATION 4 PLAN -

Q

1. 3/4" SCH 40 CPVC SOLUTION FEED PIPING, ROUTE AND SECURE ALONG WALL.
2. 6" x 2" FIBERGLASS L. SEE DETAIL 3. THIS SHEET FOR ADDITIONAL INFORMATION.
3. CORE DRILL HOLE IN FOUNDATION WALL. PROVIDE DOUBLE LUMP SEAL.



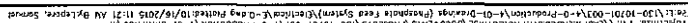
2 JUNCTION CHAMBER SECTION
SCALE: 1/4" = 1'-0"



3 PHOSPHATE SOLUTION APPLICATION POINT DETAIL
SCALE: 1/2" = 1'-0"

[illegible]

D-5





Jan
 PLANNING
 INCORPORATED
 "PROFESSIONAL MANAGEMENT"
 1311 South Linden Road, Suite B
 Millersville, MD 21108
 Tel: 410-820-2682 Fax: 410-268-2703
 A NOT A FULL COMPANY

Lockwood, Andrews
 & Newman, Inc.

KEY PLAN:

REVISIONS		FILE LOG	
REV	DESCRIPTION	DATE	BY
1	Initial design	10/1/77	WAL
2	Revised design	10/1/77	WAL
3	Final design	10/1/77	WAL
4	Revised design	10/1/77	WAL
5	Final design	10/1/77	WAL
6	Revised design	10/1/77	WAL
7	Final design	10/1/77	WAL
8	Revised design	10/1/77	WAL
9	Final design	10/1/77	WAL
10	Revised design	10/1/77	WAL
11	Final design	10/1/77	WAL
12	Revised design	10/1/77	WAL
13	Final design	10/1/77	WAL
14	Revised design	10/1/77	WAL
15	Final design	10/1/77	WAL
16	Revised design	10/1/77	WAL
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21	Final design	10/1/77	WAL
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33	Final design	10/1/77	WAL
34	Revised design	10/1/77	WAL
35	Final design	10/1/77	WAL
36	Revised design	10/1/77	WAL
37	Final design	10/1/77	WAL
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Project No. 13U-10701-003
 Date: October 16, 2015

CONTROL STATION 2 -
ELECTRICAL PLAN

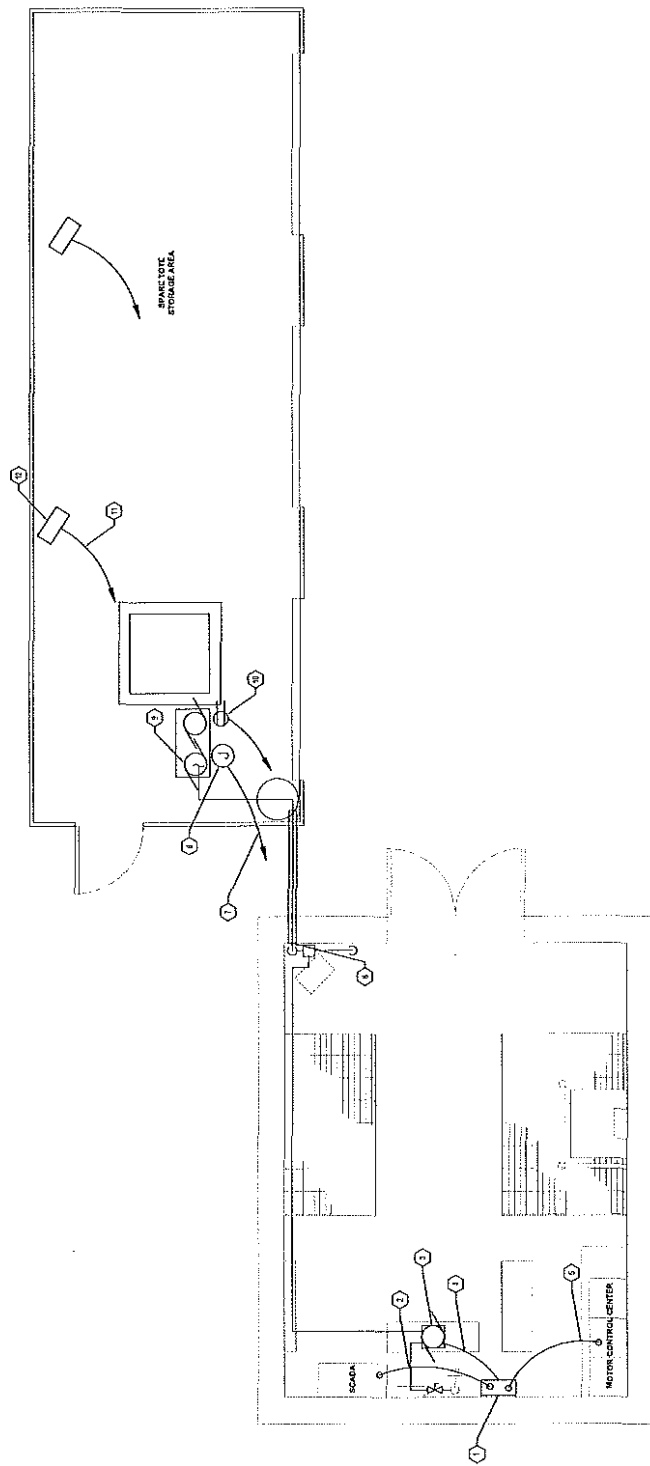
E-1

KEYED NOTES:

- [illegible]

GENERAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH NEC 2014 AND LOCAL CODES.
2. ALL CONDUIT SHALL BE GALVANIZED RIGID CONDUIT OR LEAD-FREE FLEXIBLE CONDUIT AS NOTED.
3. ALL WIRING SHALL BE TYPE THHN, OR EQUAL.
4. ALL ELECTRICAL BOXES SHALL BE 304 STAINLESS STEEL, NEMA 4X.



1 CONTROL STATION ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, October 20, 2015 2:32 PM
To: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: FW: Flint Corrosion Control Plans and MDEQ Preliminary Comments.pdf
Attachments: Flint Phosphate Calculations.pdf; MDEQ Preliminary Comments with replies (2).pdf; IBC tote scale with containment.pdf

Samir's response to our comments...

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

From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]
Sent: Monday, October 19, 2015 3:11 PM
To: Prysby, Mike (DEQ)
Subject: Flint Corrosion Control Plans and MDEQ Preliminary Comments.pdf

Hi Mike,

Please see attached for your file and use. Let me know if the information satisfy your needs and whether you have additional information that you would like us to have answered.

Thanks.

Samir F. Matta, PE
 Team Leader



**Lockwood, Andrews
& Newnam, Inc.**
 A LEO A DALY COMPANY

1311 South Linden Road, Suite B • Flint, MI 48532
 2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
 D 517.819.2367 C 517.819.2367
www.lan-inc.com • sfmatta@lan-inc.com

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Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal $5,974 \times 0.75$

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 $4,480/97.9913$

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{-3}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{-3}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

Proposed Operating Parameters

	Plant Flow	Dosage as PO_4^{-3}	Dosage as P*
Maximum	25 MGD	1.5 mg/l	0.47 mg/l
Average	16 MGD	0.8 mg/l	0.25 mg/l
Minimum	4 MGD	0.4 mg/l	0.13 mg/l

*Equivalent dosage to PO_4^{-3} dosage

Feed Rate Calculations

Maximum feed rate (Max Flow $\times$ Max Dosage)

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 1.5 \text{ ppm} / 4,341.92 \text{ g/gal} = 32.66 \text{ gpd Phosphoric Acid}$$

Average feed rate (Avg Flow $\times$ Avg Dosage)

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 0.8 \text{ ppm} / 4,341.92 \text{ g/gal} = 11.15 \text{ gpd Phosphoric Acid}$$

Minimum feed rate (Min Flow $\times$ Min Dosage)

$$4 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 0.4 \text{ ppm} / 4,341.92 \text{ g/gal} = 1.39 \text{ gpd Phosphoric Acid}$$

**Flint WTP Improvements
Corrosion Control Proposal
MDEQ Comments
October 16, 2015**

1. **The compound being referenced is 75% Phosphoric Acid. We are assuming this is the orthophosphate compound. What is the % available orthophosphate as phosphate (P)?** See attached calculations.
2. **What is the density of the phosphate compound in lbs/gal?** 13.17 lb/gal @ 25°C
3. **Water from Detroit is approx. 0.3 – 0.4 mg/l of orthophosphate as phosphate (P). We will concur with the proposal to add sufficient orthophosphate in order to maintain a 0.5 – 1.0 mg/l as P in the distribution system.** This is the intent of the system. Dosage will be adjusted based upon measured results in the distribution system.
4. **The orthophosphate compound needs to be an NSF Standard 60 approved product.** The specification that will be used for purchase requires NSF certification.
5. **How will the phosphate dosage be measured? Weigh scale or scada? If scales are to be used, this needs to be included in the proposal.** We will add IBC tote scales with secondary containment. The drawings will be modified to show this; see attached manufacturer's information.
6. **What is the purpose of the boosted water supply that mixes with the phosphate compound?** The boosted water supply is intended to provide sufficient injected volume to ensure complete mixing.

IBC TOTE SCALE

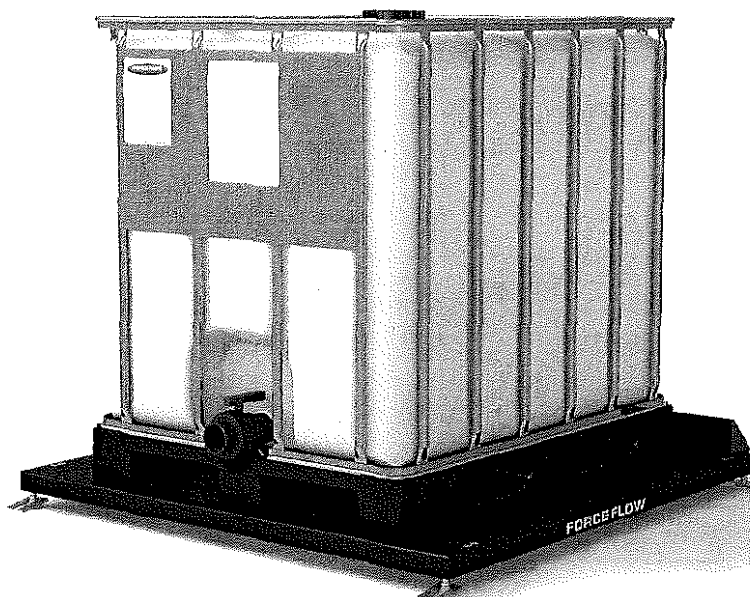
FOR CHEMICAL IBC TOTES

Safely track
chemical usage
and tank levels

Warn of dangerous
over and under-
feed conditions

Prevent system
from running
empty

4-20mA remote
monitoring reduces
operator exposure
to chemicals



NO FINGER POINTING.
NO FIRE FIGHTING.



Strict federal and state reporting requirements have created a need for water and wastewater plant operators to easily and accurately track chemical feed rates and usages. The IBC Tote Scale gives you this information along with the assurance that your chemical supply will not unexpectedly run out.

The heavy duty steel platform is protected with our advanced 80 mil thick TUF-COAT™ Environmental Armor. Tuf-Coat is highly resistant to chemicals, abrasion, impact and ultraviolet light degradation making the IBC Tote Scale ideal for even the harshest environments. Options include 316 stainless steel and MaxSense™ high accuracy models.

The IBC Tote Scale utilizes weighing technology to create a highly reliable, non-contacting chemical monitoring system that avoids problems other sensor technologies face caused by irregular tank shapes, corrosive chemical fumes, fluctuating temperatures and changes in specific gravity.



FORCE FLOW

IBC TOTE SCALE

MODELS AND ORDERING INFORMATION

IBC Tote Scales do not include weight indicating instrument. Select from the following: Wizard 4000® Advanced Digital Display (Bulletin 518), the SOLO® G2 Digital Weight Display (Bulletin 516), the SOLO XT® Hydraulic Digital Display (Bulletin 514), the Century Hydraulic dial (Bulletin 519) or Hypo Track® (Bulletin 517). Please order indicator separately.

ELECTRONIC - Single Load Cell Platform (Includes platform with backstop and electronic load cell with 20 ft. cable. Lengths up to 100 ft. available; request when ordering.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DR××TB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
54-DR××TBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
60-DR××TB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/4 of 1% FS
60-DR××TBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/4 of 1% FS



WIZARD 4000®



SOLO® G2



HYPO TRAK®



ELECTRONIC - HI Accuracy 4-Load Cell Platform (Includes platform and (4) electronic load cells with 20 ft. of cable. Lengths up to 100 ft. available; request at time of purchase. Backstop not included or necessary on these models but available upon special request.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DR××TB-HA4	TUF-COAT® STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
54-DR××TBS-HA4	316 STAINLESS STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
60-DR××TB-HA4	TUF-COAT® STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS
60-DR××TBS-HA4	316 STAINLESS STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS



WIZARD 4000®



SOLO® G2



HYPO TRAK®



HYDRAULIC - Single Load Cell Platform (Includes platform with backstop, and hydraulic load cell with 12 ft. Hose and quick connect. Hose/tubing lengths up to 100 ft. available to allow remote mounting of indicator; request at time of purchase.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-HY××TB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
54-HY××TBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
60-HY××TB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/2 of 1% FS
60-HY××TBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/2 of 1% FS



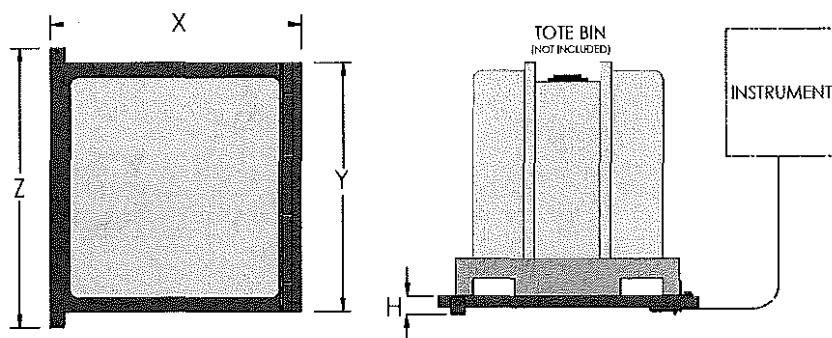
CENTURY®



SOLO XT®



×× = CAPACITY: 1000 lbs = "10", 2000 lbs = "20", 3000 lbs = "30", 4000 lbs = "40", 5000 lbs = "50"



SPECIFYING GUIDELINES:

- For maximum accuracy, size scale capacity to match the gross weight (chemical plus tote tare weight).
- Tote size should not exceed platform size.
- Supply connections must be flexible and preferably connected to tote over pivoted side of platform.

Please visit www.forceflow.com for drawings, engineered specifications and manuals.

FORCE FLOW

MODEL NUMBERS (for Load Cell & Platform)

60-DR30TC-HA4 (3,000 Lbs.) 60" x 60" x 3.25"
 60-DR40TC-HA4 (4,000 Lbs.) 60" x 60" x 3.25"
 60-DR50TC-HA4 (5,000 Lbs.) 60" x 60" x 3.25"
 60-DR60TC-HA4 (6,000 Lbs.) 60" x 60" x 3.25"

For Stainless Steel platform, as "S" after "TC", i.e. 60-DR30TCS-HA4.
 For other capacities and platform sizes, consult factory.

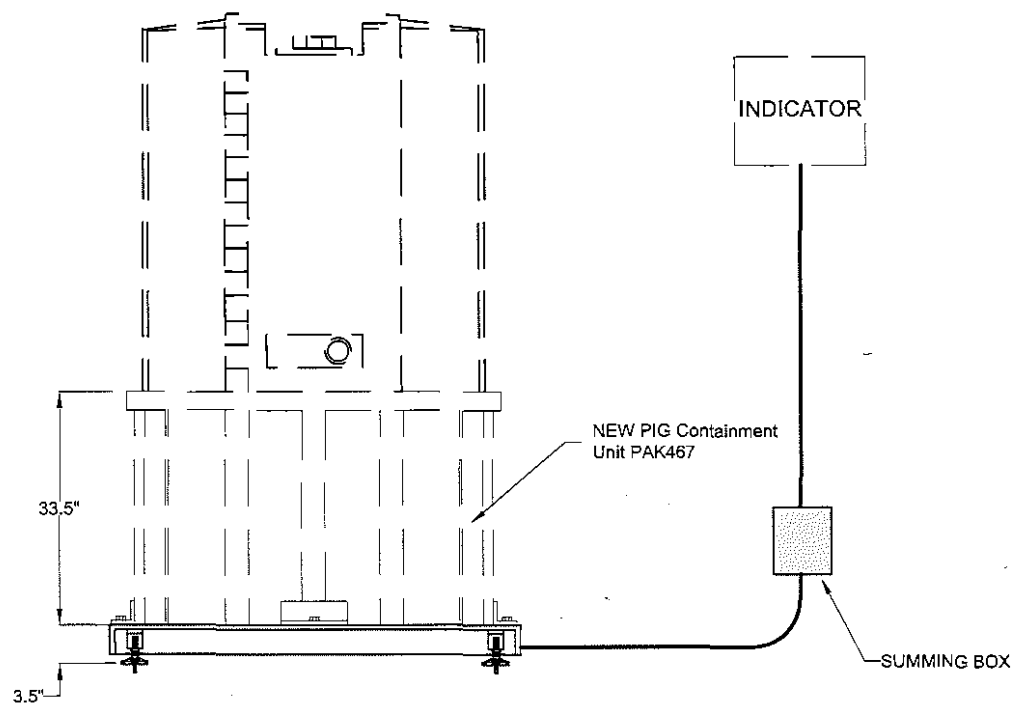
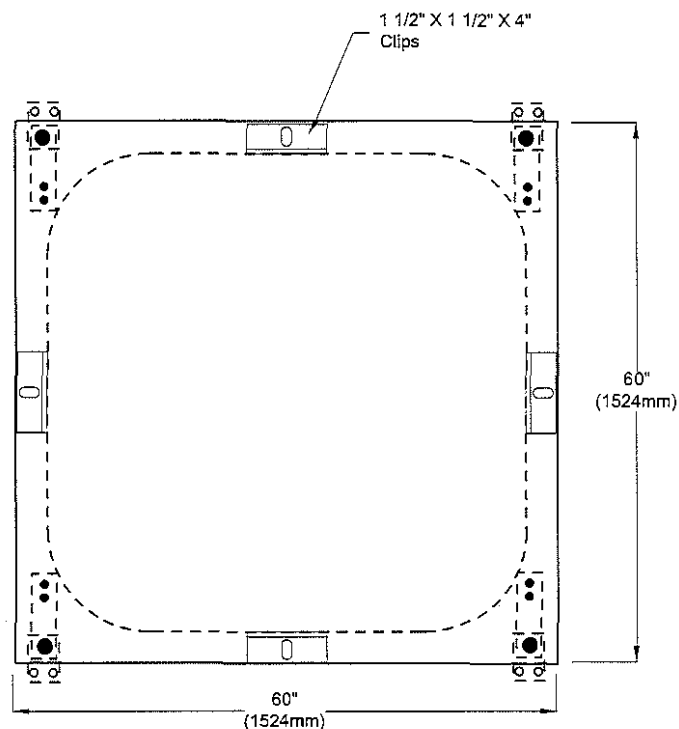
MODEL NUMBER (for SOLO 1000 Indicator)

SR-1000-1 1-Channel SOLO 1000 Indicator
 SR-1000-2 2-Channel SOLO 1000 Indicator

MODEL NUMBER (Containment Unit)

PAK467 400 gal. NEW PIG Poly IBC Containment Unit

_____ Scale Model Number
 _____ Pounds or Kilogram Indication
 _____ Feet of Cable (20' Standard)
 _____ Tote Skid Size
 400 _____ Containment Size (Gallons)

**INSTALLATION NOTE:**

We recommend using a forklift to load/unload totes.
 If a pallet jack is to be used, scale platform must be pit mounted so deck is flush with floor surface.
 Surface mounting with use of inclined load ramps are NOT RECOMMENDED.

FORCE FLOW

2430 Stanwell Dr, Concord, Ca 94520 USA
 1-800-893-6723 US & Canada, Fax: 925-686-6713
 WWW.forceflow.com / Info@forceflow.com

F:\EMAIL\SUBMITTAL FORMS\Autocad Drawings\31431 HA Tote Bin Scale 60 Containment.dwg

HI-ACCURACY ELECTRONIC
 60" TOTE BIN SCALE
 CONTAINMENT

Drawn by: KBV

Date: 1/23/09

Revised: 4/13/10

Scale:

Drawing Number

31431

---NOT SUPPLIED BY FORCE FLOW---
For use with Force Flow Scale Model 60-DR100TCH44



New Pig

Your partner for a clean
and safe workplace.

1-800-HOT-HOGS® (468-4647)

Product Data Sheet

Item Number: PAK467

Item Name: PIG® Poly IBC Containment Unit

Load Capacity UDL:

- 12000 lbs./each (5443.2 kg/each)

Sump Capacity:

- 400 gal./each (1514 L/each)

Options Available:

Item #	Size	Color	Misc. Features	Amount	Length	Width	Height	Depth	Int. Dia.	Ext. Dia.	Weight	Qty/Pallet
PAK467	—	—	—	1 each	58" (147.3cm)	58" (147.3cm)	33.5" (85.1cm)	—	—	—	415lbs. (188.2kg)	1

Color: White/Black

Description:

Polyethylene containment unit used to help meet containment regulations when storing IBCs.

Application:

Used to help meet containment regulations when storing IBCs of 400 gallons or less containing materials compatible with polyethylene. IBCs can be stacked two high.

Product Features:

Super-strong Containment Unit helps you comply with regulations and store IBC tanks safely. Capture leaks, drips and spills to keep floors dry and workers safe.

- Heavy-duty construction permits double-stacking of IBCs to save space
- Solid anti-slip deck holds a variety of IBC sizes; If tank has feet or pegs, be sure to use proper support pads or plates
- Positioning pegs in pedestals keep deck from shifting
- Polyethylene construction resists UV rays, rust, corrosion and most chemicals
- Translucent white sidewalls allow easy visual inspection
- Arrives ready to use with no assembly required

Composition:

- Sump - Polyethylene
- Grates - Injection Molded Polyethylene

This product helps you comply with:

Regulatory Citation	Summary
40 CFR 264.175	Hazardous waste containment systems must be free of structural cracks or gaps, be designed to keep spilled liquids from remaining in contact with the container, prevent run-on and "have sufficient capacity to contain 10% of the volume of the containers, or the volume of the largest container, whichever is greater."

Additional Specifications:

- Dimensions (Grate): 52" L x 52" W

Disclaimers:

- **Flammables Notice:** If using this product with flammable liquids, please consider the regulations that apply to storage and handling of flammable liquids and the safety of this application, specifically flammable vapors, static discharge and heat sources. For further assistance, please call Technical Services.

PDS generated: Jul 14, 2008

One Pork Avenue, Tipton, PA 16684-0304 • 1-800-HOT-HOGS® (468-4647)
Fax: 1-800-621-PIGS® (621-7447) • Email: hothogs@newpig.com • Web: newpig.com

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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, March 26, 2013 12:37 PM
To: Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ)
Cc: Willard, Veronica (DEQ); Shekter Smith, Liane (DEQ)
Subject: Flint Draft Response

Director Wyant,

In preparation for our call today with Treasurer Dillon's office, ODWMA has developed the following for consideration. We can provide any additional info you require during the meeting.

ODWMA has reviewed the materials developed by the consultant Tucker, Young, Jackson, Tull, Inc. (TYJT) for Treasury regarding the City of Flint and potential alternatives for public water supply. Based on our reviews, we have developed the following comments to this point in our analysis:

1. The TYJT report does not contain the full scope of the Karegnondi Water Authority (KWA) raw water supply system. TYJT concerns over raw water supply redundancy and reliability are addressed to the satisfaction of ODWMA under the full KWA proposal. Please note some portions of the overall project are being financed independently by the Genesee County Drain Commission.
2. There are significant differences in contract language between KWA and Detroit Water and Sewerage Department (DWSD) with respect to the contracted maximum day demand capacity.
 - a. Under a KWA contract, a "maximum day" capacity of 18 million gallons per day (MGD) would fully satisfy current demands of the City of Flint, without the need to supplement raw water capacity using the Flint River. (18 MGD, average over a 30 day period).
 - b. Under a DWSD model contract, a "maximum day" capacity, even at 18 MGD, would not satisfy the current demands for the City of Flint. (18 MGD, over any 24 hour period).
3. Restrictions in contracted capacity that would prevent the City of Flint from meeting peak demand requirements present potential limits to economic development within the City of Flint, including possible connection bans and water system extension bans. This information was previously conveyed to the City of Flint by ODWMA staff.
4. All contract options with DWSD that are considered semi-competitive with the KWA contract do not fully supply the City of Flint, and would require the City of Flint to meet a significant, if not majority, of its water demands by treating water from the Flint River. Continuous use of the Flint River at such demand rates would:
 - a. Pose an increased microbial risk to public health (Flint River vs. Lake Huron source water)
 - b. Pose an increased risk of disinfection by-product (carcinogen) exposure to public health (Flint River vs. Lake Huron source water)
 - c. Trigger additional regulatory requirements under the Michigan Safe Drinking Water Act (LT2ESWTR)
 - d. Require significant enhancements to treatment at the Flint WTP, beyond those identified in the TYJT report (see item X below).
 - e. Water Resource Division is evaluating potential impacts to NPDES wastewater discharge permits in downstream segments of the Flint River.
5. The TYJT report does not adequately address increased requirements and costs associated with using the Flint River as a significant source for the Flint WTP, which are not necessary under a Lake Huron source water scenario. This includes:

- a. The need to provide softening treatment
 - b. Limitations on disposal options for lime softening sludge
 - c. Increased ozone capacity, UV disinfection
 - d. Additional backup power, more power required for Flint River operation
6. The Flint WTP must operate at some minimum level and within a range of flow rates to maintain treatment effectiveness. Currently that minimum level is 9 MGD. This level may be reduced with additional capital costs to modify the WTP, not addressed in the TYJT report.
7. Allowing Flint WTP to blend water with DWSD sets a new precedent that could pose future consequences with other DWSD customers.
8. Costs impacts to remaining DWSD customers would be similar under the proposed scenarios, only retaining 8 MGD of 30+ MGD total Flint/Genesee Co. demands, based on the following:
 - a. Genesee County distribution system demands are pulling out of DWSD regardless of the decisions by Flint WTP
 - b. Flint's need to utilize the Flint River as a source
9. ODWMA anticipates cost savings under the KWA proposal will be leveraged to provide additional improvements to the City of Flint water distribution system, improving efficiency and providing additional cost benefits.
10. Major cost discrepancies in TYJT analysis
 - a. Engineering, Legal, Administration, Contingency – TYJT appears to have effectively double charged for these costs in their KWA estimates without adequate justification
 - b. Pumping facilities – TYJT cost estimate methodology does not appear to address localized market costs and does not distinguish fixed and variable costs in its comparison analysis.
11. Remaining DWSD customers in Lapeer County could potentially see water quality impacts as a result of Flint joining KWA.
 - a. City Lapeer
 - b. City of Imlay City

Additional response to the TYJT report has also been provided by Rowe Engineering to Flint EFM, Mr. Ed Kurtz.

ODWMA has continued to meet on a regular basis with KWA, Genesee County, and the City of Flint regarding these water supply proposals.

ODWMA will continue to provide any additional detailed analysis requested by Treasury or the DEQ Executive Office.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, September 17, 2015 3:08 PM
To: 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Pallone, Maggie (DEQ)
Cc: Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov); Feuerstein, Heather (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov); Sygo, Jim (DEQ) (SygoJ@michigan.gov)
Subject: 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

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

DRAFT

DRINKING WATER - LEAD - DISTRIBUTION OF RESPONSIBILITIES

Environmental Protection Agency Promulgation of Federal Safe Drinking Water Act Rules 1974 Safe Drinking Water Act 1991 Lead and Copper Rule 2000 Lead and Copper Rule Minor Revisions 2007 Lead and Copper Rule Short Term Revisions ???? Lead and Copper Rule Long Term Revisions Granting Primacy of Federal Regulations to States Auditing of State Public Water Supply Programs Provide Funding to States	Michigan Department of Environmental Quality Primacy - Michigan Safe Drinking Water Act and Administrative Rules Oversight of public water systems Inspections Construction Permitting Provide loans to water systems for public infrastructure improvements State Laboratory Services Laboratory Certification Establish monitoring requirements, quantity and frequency Verification of monitoring results and compliance determination Notify water systems of Action Level Exceedance Establish Water Quality Parameter Ranges, as necessary State Reporting to EPA Operator Training and Certification
City of Flint Water System Certified Operation of public water system Establish Water Rates Obtain construction permits Reporting to MDEQ Coordination of lead and copper sampling Establishing a Tiered Sampling Pool Providing Sampling Kits and Instructions to customers Obtain signed statements from participating customers Obtain sample analysis Provide individual lead sample result to participants Comply with Action Levels for lead and copper Provide lead monitoring and notice Certification to MDEQ Provide Annual Report (CCR) to all customers Conduct Water Quality Parameter Monitoring Recommend and Install Optimized Corrosion Control Treatment Provide Public Notification, as necessary Replace public portion of lead service, as necessary	Water Customers Participate in lead sampling as requested Request lead testing if concerned Follow lead sampling Instructions Provide signed information on how sample was collected Review individual result material Follow instructions for reducing lead exposure Replace private leaded service line and plumbing materials with lead-free products Obtain plumbing permits and comply with code requirements Pay Water Bills Read Annual Report (CCR) Read and follow Public Notification materials

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 obtain 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 leaded 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.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, February 12, 2014 9:45 AM
To: Richard Benzie P.E. (BENZIER@michigan.gov); Monosmith, Carrie (DEQ); Craig, John (DEQ); Shekter Smith, Liane (DEQ)
Cc: prysbym@michigan.gov
Subject: FW: Flint ACO language
Attachments: city-of-flint-bray-road-co-2014-02-06b-draft.docx

We are still trying to negotiate language in ACO the "Statement of Purpose" section that will appease both parties. They would like us to use the language in quotations below. The revised language does not force connection to KWA, and instead allows other options. As we have stated in the past construction permits will be necessary for the connection to KWA and construction permits are also necessary to allow the Flint WTP to operate on a continuous (non-emergency basis) regardless of source.

If this language will not be acceptable I need to know and will need to discuss how what we would want to adjust. The last ACO draft is attached for reference.

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

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Monday, February 10, 2014 5:44 PM
To: Busch, Stephen (DEQ)
Cc: Daugherty Johnson
Subject: ACO

Steve, I checked with the City's bond counsel, and here is language that we MUST include in the consent order so that the City can move forward on this. Please let me know immediately if this language is or is not acceptable. If you would like to discuss it, please let me know.

Thanks,
 Mike

"The respondent plans to use the Flint River as its temporary source of untreated water supply until KWA water is available. The respondent must undertake the KWA public improvement project or undertake other public improvement projects to continue to use the Flint River, such as additional water treatment plant public improvements, source water protection public improvements and public improvements to obtain back-up water supply, in order to comply with Act 399."

city-of-flint-bray-road-co-2014-02-06b-draft

Privileged and Confidential Settlement Communication

This document is for the purpose of settlement and is subject to the privilege that applies to communications made in settlement negotiations. It is provided solely for the consideration and use of the intended recipient(s), their principals, and their legal counsel. It should not be disclosed to any other person without the express consent of the Department of Environmental Quality.

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF WASTE MANAGEMENT AND RADIOLOGICAL PROTECTION

In the matter of the
administrative proceedings against
City of Flint, doing business at
5200 Bray Road, Genesee Township,
Genesee County, Michigan

OWMRP Order No. 115- -14

CONSENT ORDER

This proceeding results from unresolved allegations specified in the Letters of Warning, (LOWs) issued on April 9, 2001, and February 14, 2002, by the Department of Environmental Quality ("DEQ"), Waste Management Division, and the Compliance Communication, dated January 18, 2011, issued by the DEQ, Environmental Resource Management Division, both now known as the DEQ, Office of Waste Management and Radiological Protection ("OWMRP") (Attachment 1). The DEQ alleges that the city of Flint ("Respondent") at 5200 Bray Road, Genesee Township, Genesee County, Michigan (the "Site"), placed or allowed the placement of solid waste in an open dump and/or abandoned solid waste in place of other disposal in violation of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Michigan Compiled Laws ("MCL") 324.101 *et seq.* ("NREPA"), and the administrative rules promulgated under Part 115. The Respondent and the DEQ agree to resolve the alleged violations set forth in the above-referenced LOWs and Compliance Communication by entry of this Consent Order.

STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of the Respondent and the DEQ are to address the open dump created at the Site, eliminate the surface water discharge from the Site to the Cornwell Drain, and allow the Respondent to reconstruct the system at the Site used to manage drinking water treatment plant (WTP) residuals.

city-of-flint-bray-road-co-2014-02-06b-draft

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To accomplish these objectives, the Respondent will determine the areal extent and character of any solid waste historically disposed of at the Site, including, but not limited to, the WTP residuals and any solid wastes identified as being disposed of in the above-referenced LOWs and Compliance Communication. Consistent with the waste characterization and other investigation data, the Respondent will either remove and dispose of the waste at a disposal area that is permitted and licensed by the DEQ or, if acceptable, leave the solid waste in place and place final cover over it in accordance with the requirements of Part 115 and this Order. In addition, the Respondent will determine, by conducting a remedial investigation, whether any response activities must be taken to address contamination caused by the unauthorized disposal of solid waste at the Site.

Finally, if the Respondent proposes to reconstruct the system for the non-mechanical dewatering of its WTP residuals at the Site, then the Respondent will submit plans and specifications and secure from the DEQ, Office of Drinking Water and Municipal Assistance ("ODWMP"), a public water supply construction permit issued under Section 4 of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), MCL 325.1001 *et seq.*, and the administrative rules under Act 399 prior to initiating any construction, alteration, addition, or improvement to such system. A residuals management plan for the historical disposal of lime sludge and other WTP residuals, as well as lime sludge and any other WTP residuals generated in the future, must also be included as part of the construction permit application. The Respondent's proposal is based on its participation in the Karegnondi Water Authority (KWA) to receive source water from Lake Huron for its drinking water supply and the use of its water treatment plant to meet treatment requirements under Act 399. It will be approximately four years before the KWA infrastructure is built and water is available to the Respondent from KWA. The Respondent plans to use the Flint River as its source water supply until KWA water is fully available. Public improvement projects under Act 399 are required to be completed for Respondent to receive water from the KWA.

city-of-flint-bray-road-co-2014-02-06b-draft

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I. DEFINITIONS

- 1.1 "Act 399" means the Safe Drinking Water Act, 1976 PA 399, as amended, MCL 325.1001 *et seq.*
- 1.2 "FAM" means the financial assurance mechanism acceptable to the DEQ to pay for monitoring, operation and maintenance, oversight, and other costs determined by the DEQ to be necessary to ensure the effectiveness and integrity of the remedial action. The FAM is a component of a Remedial Action Plan.
- 1.3 "NREPA" means the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*
- 1.4 "Open dump" means any area, place, or property where solid waste has been illegally disposed of or abandoned in place of other disposal.
- 1.5 "Part 115" means Part 115, Solid Waste Management, of the NREPA, MCL 324.11501 *et seq.*, and the Part 115 Administrative Rules.
- 1.6 "Part 115 Rules" means the administrative rules promulgated under Part 115.
- 1.7 "Part 201" means Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*, and the Part 201 Administrative Rules.
- 1.8 "Residuals Management Plan" means a DEQ-approved plan to remove both historical and future accumulations of lime sludge and other WTP residuals from the Site.
- 1.9 "Site" means the property located at 5200 Bray Road, Genesee Township, Genesee County, Michigan.

city-of-flint-bray-road-co-2014-02-06b-draft

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- 1.10 "Solid Waste" as used in this Consent Order means "solid waste" as defined in Part 115 of the NREPA, MCL 324.11506(1), including any waste that has been disposed of at the Site, including lime sludge from WTP operations conducted by the Respondent.

II. STIPULATIONS

The Respondent and the DEQ stipulate as follows:

- 2.1 Pursuant to its authority under Part 115, the DEQ promulgated administrative rules necessary to implement Part 115. These rules are set forth in the 2005 *Annual Administrative Code Supplement* (AACS), R 299.4101 *et seq.* ("Part 115 Rules").
- 2.2 Pursuant to its authority under Act 399, the DEQ promulgated administrative rules necessary to implement Act 399. These rules are set forth in the 2009 AACS, R 325.10101 *et seq.*
- 2.3 Pursuant to the NREPA and Executive Order No. 2011-1, the Director of the DEQ ("Director") is the state official and the DEQ is the state agency charged with the administration and enforcement of Part 115 and Act 399. This Consent Order is authorized under MCL 324.11519(2) and MCL 325.1022.
- 2.4 The Respondent is a "person" as defined by MCL 324.301(g) and MCL 325.1002(m).
- 2.5 The Respondent owns and operates the Site located at 5200 Bray Road, Genesee Township, Genesee County. The Respondent is a state of Michigan municipality.
- 2.6 The Site occupies approximately 76 acres of land adjacent to the Cornwell Drain on its northern boundary. The Cornwell Drain is a tributary to the Flint River. The Site consists of a WTP residuals storage area and contains various water level control structures and discharge points to the Cornwell Drain, and an area of where solid waste has been disposed in an open dump ("Open Dump"). Attachment 2 is an aerial

city-of-flint-bray-road-co-2014-02-06b-draft

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schematic of the Site and shows the approximate boundaries of the WTP residuals storage area and the Open Dump.

- 2.7 The Respondent stipulates that the issuance and entry of this Consent Order is proper and acceptable. This Consent Order shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the OWMRP ("Office Chief"), designee of the Director, pursuant to MCL 324.301(b) of the NREPA.
- 2.8 The Respondent agrees to fully and strictly comply with all provisions of Part 115 and Act 399, the Part 115 Rules, the Act 399 Rules, and all other applicable state and federal statutes.
- 2.9 The Respondent and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Respondent of the allegations contained in the above-referenced LOWs and Compliance Communication or that the law has been violated.
- 2.10 The Respondent, all Respondent's successors and assigns, and the DEQ agree to and shall be bound by the requirements of this Consent Order.

III. COMPLIANCE PROGRAM

In order to resolve the violations alleged in the above-referenced LOWs and Compliance Communication, the Respondent shall achieve and maintain compliance with the requirements specified below in accordance with the following schedule:

- 3.1 On and after the effective date of this Consent Order, the Respondent shall ensure that the Site is secure and that, pursuant to R 299.4128(1), illegal dumping does not occur at the Site.
- 3.2 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall locate groundwater monitoring well MW-04. If MW-04 is found to be located within

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the footprint of the non-mechanical dewatering system identified in the construction plans referenced in Paragraph 3.4, MW-04 will be properly abandoned/removed within a mutually agreed upon schedule.

- 3.3 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall permanently cap the outlet tower identified in Attachment ____ and take all necessary actions to identify and terminate surface water discharges to the Cornwell Drain.
- 3.4 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the ODWMP for review and approval, an administratively complete Act 399 construction permit application for the reconstruction of the non-mechanical dewatering system for WTP residuals at the Site, including the physical barrier that will separate the WTP filter backwash, including lime sludge, from the other solid waste located on the Site. The permit application will clearly identify any areas that will not be used as part of the reconstructed non-mechanical dewatering system and identify any slurry inlet points located outside the system footprint so such inlet points can be permanently capped by the Respondent. The permit application will also include a basis of design for the management of solid WTP residuals within the system.
- 3.5 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the OWMRP for review and approval, any portion of the dewatering system residuals management plan submitted to the ODWMA that is required to comply with Part 115.
- 3.6 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a hydrogeologic monitoring plan ("Hydrogeologic Monitoring Plan") for the Open Dump that complies with R 299.4904, R 299.4905, R 299.4906, R 299.4907, and R 299.4908 of the Part 115 Rules. Upon approval by the DEQ, the Respondent shall implement the Hydrogeologic Monitoring Plan in accordance with the schedule contained therein.

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- 3.7 Within sixty (60) days after the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a remedial investigation work plan ("Remedial Investigation Work Plan") for the Open Dump. Upon approval by the DEQ, the Respondent shall implement the Remedial Investigation Work Plan in accordance with the schedule contained therein. If the Respondent believes that sufficient data already exists to define the environmental conditions at the Open Dump, then the Respondent can submit, in lieu of the Remedial Investigation Work Plan, the Remedial Investigation Report identified in Paragraph 3.8 of this Consent Order.
- 3.8 Within thirty (30) days of completing the remedial investigation, the Respondent shall submit to the DEQ for review and approval, the final results and conclusions of the remedial investigation, including all data, charts, maps, aquifer and soil cross-sections, contaminant concentration contours, diagrams, and other interpretive drawings, in the form of a written report ("Remedial Investigation Report").
- 3.9 If the Remedial Investigation Report fails to delineate the horizontal and vertical extent of the Open Dump or any contamination attributable to the Open Dump, the Respondent shall develop and implement a Phase II remedial investigation. If applicable, a complete and technically adequate work plan for a Phase II remedial investigation ("Phase II Remedial Investigation Work Plan") shall be submitted to the DEQ within sixty (60) days of the DEQ's notification that the Phase II Remedial Investigation Work Plan is necessary. Upon approval by the DEQ, the Respondent shall implement the Phase II Remedial Investigation Work Plan in accordance with the schedule contained therein. The Respondent shall submit final results and conclusions of the Phase II remedial investigation in the form of a written report within thirty (30) days of completion of the Phase II remedial investigation.
- 3.10 The Respondent shall submit to the DEQ, within ninety (90) days of written DEQ approval of the Remedial Investigation Report(s) required by Paragraphs 3.7 and 3.8, an assessment of corrective measures ("Assessment of Corrective Measures") that is in

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accordance with R 299.4443. The Assessment of Corrective Measures shall include an analysis of each potential remedy considered. In addition, the Assessment of Corrective Measures shall identify the final remedial action proposed by the Respondent and provide an explanation of how that action will meet applicable cleanup criteria of Part 201 and be in compliance with Part 115.

- 3.11 Within one hundred twenty (120) days of receipt of written approval of the Assessment of Corrective Measures from the DEQ, the Respondent shall submit to the DEQ for review and approval, a complete and technically adequate remedial action plan ("Remedial Action Plan") for the Open Dump that is in compliance with the requirements of R 299.4444. The Remedial Action Plan shall include a detailed schedule for implementation. The Remedial Action Plan shall be consistent with the results of the remedial investigation and any other monitoring data collected, reports submitted, and/or investigations conducted prior to submittal of the Remedial Action Plan. The Remedial Action Plan, when implemented, shall comply with the applicable cleanup criteria of Part 201 and, upon approval of the plan by the DEQ, the Respondent shall implement the approved Remedial Action Plan in accordance with the schedule contained therein.
- 3.12 If, in accordance with an approved Assessment of Corrective Measures, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the Remedial Action Plan, submit to the DEQ for review and approval, a capping and cell closure plan and schedule ("Capping and Cell Closure Plan") and a post closure plan ("Post Closure Plan") for the Open Dump that are in compliance with the requirements of R 299.4425, R 299.4447, respectively, and Part 115. Upon DEQ approval of the Capping and Cell Closure Plan and the Post Closure Plan, the Respondent shall implement the plans in accordance with the schedules contained therein. If the Respondent lacks the expertise and/or manpower to conduct the work in accordance with the DEQ-approved Capping and Cell Closure Plan, the Post Closure Plan, and the Part 115 Rules, the Respondent shall contract the work to be performed by a contractor experienced with landfill construction work.

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3.13 The Respondent shall provide financial assurance as required under Part 115.

IV. DEQ APPROVAL OF SUBMITTALS

- 4.1 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Consent Order to be submitted to the DEQ by the Respondent, the following process and terms of approval shall apply.
- 4.2 To be approved by the DEQ, any work plan, proposal, or other document required to be submitted by this Consent Order shall include all of the information required by the applicable statute and/or rule and all of the information required by the applicable paragraph(s) of this Consent Order.
- 4.3 Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Consent Order and shall be enforceable in accordance with the provisions of this Consent Order.
- 4.4 In the event the DEQ disapproves a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific reasons for such disapproval. The Respondent shall submit, within thirty (30) days of receipt of such disapproval, a revised work plan, proposal, or other document that adequately addresses the reasons for the DEQ's disapproval.
- 4.5 In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require the Respondent to submit, prior to implementation and within thirty (30) days of receipt

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of such approval with specific modifications, a revised work plan, proposal, or other document that adequately addresses such modifications.

- 4.6 A finding of approval or approval with modification of a submission shall not be construed to mean that the DEQ concurs with any of the conclusions, methods, or statements in the submission or warrants that the submission comports with law.
- 4.7 Failure by the Respondent to submit an approvable work plan, proposal, or other document within the applicable time period specified above shall subject the Respondent to the enforcement provisions of this Consent Order including, but not limited to, the stipulated penalty provisions commencing on the date the revised work plan, proposal, or other document was due and accumulating until an approvable work plan, proposal, or other document is submitted.
- 4.8 Any delays caused by the Respondent's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the Respondent's responsibility to comply with any other deadline(s) specified in this Consent Order.
- 4.9 No informal advice, guidance, suggestions, or comments by staff of the DEQ regarding reports, work plans, proposals, plans, specifications, schedules, or any other writing submitted by the Respondent will be construed as relieving the Respondent of its obligation to obtain written approval of the DEQ if and when required by this Consent Order.

V. MODIFICATIONS AND EXTENSIONS

- 5.1 At the request of the Respondent, a work plan, proposal, or other document approved or approved with specific modifications by the DEQ, with the exclusion of the specified deadlines set forth in Section II, Compliance Program, of this Consent Order, may be modified by the OWMRP District Supervisor ("District Supervisor").

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5.2 The Respondent and the DEQ agree that the Office Chief may, but in no circumstances is obligated to, grant the Respondent an extension of the specified deadlines set forth in this Consent Order. Any extension shall be preceded by a timely written request, received by the DEQ no later than ten (10) business days prior to the pertinent deadline, which shall include:

- a. An identification of the specific deadline(s) of this Consent Order that will not be met.
- b. A detailed description of what will prevent the Respondent from meeting the deadline(s).
- c. A description of the measures the Respondent has taken and/or intends to take to meet the required deadline(s).
- d. The length of the extension requested and the specific date(s) on which the obligation(s) will be met.

5.3 The Office Chief shall respond promptly to such requests and shall not unreasonably withhold approval for such requests.

5.4 Any extension of the specified deadlines or other modifications and amendments of this Consent Order shall require a formal written amendment of this Consent Order, shall be signed by the Respondent and the DEQ ("Parties"), shall have as their effective date the date on which they are signed by the Office Chief, and shall be incorporated into and become an enforceable part of this Consent Order.

VI. REPORTING

6.1 The Respondent shall submit all items required in Section II, Compliance Program, to the Lansing District Supervisor, OWMRP, DEQ, P.O Box 30241 Lansing, Michigan

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48909-7742, unless specifically directed otherwise within this Consent Order. The cover letter with each submittal shall identify the specific paragraph and requirement of this Consent Order that the submittal is intended to satisfy. If the address of the District Supervisor changes, the Respondent will be notified and shall make all subsequent submittals to any new address of which they are notified.

- 6.2 The Respondent shall verbally report any violation(s) of the terms and conditions of this Consent Order to the District Supervisor by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with a written report within five (5) business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), the precise cause or causes of the violation(s), a detailed description of any action(s) taken or proposed to correct the violation(s), and a schedule for the implementation of any proposed corrective action(s). The Respondent shall report any anticipated violation(s) of this Consent Order to the District Supervisor in advance of the relevant deadlines, whenever possible.

VII. RETENTION OF RECORDS

- 7.1 Upon request by an authorized representative of the DEQ, the Respondent shall make available to the DEQ all records, plans, logs, and other documents required to be maintained under this Consent Order, or pursuant to Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules. All such documents shall be retained at the Disposal Area for at least a period of three (3) years from the date of generation of the record unless a longer period of record retention is required by Part 115 and the Part 115 Rules and Act 399 and the Act 399 Rules.

VIII. RIGHT OF ENTRY

- 8.2 The Respondent shall allow any authorized representative or contractor of the DEQ, upon presentation of proper credentials, to enter upon the premises of the Site at all

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reasonable times for the purpose of monitoring compliance with the provisions of this Consent Order. This paragraph in no way limits the authority of the DEQ to conduct tests and inspections pursuant to the NREPA and its rules or any other applicable statutory provision.

IX. FINES, COSTS, AND PENALTIES

- 9.1 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall pay the sum of \${_____} to the State of Michigan in settlement of the DEQ's claim for civil fines arising from the violations alleged in the above-referenced LOWs and Compliance Communication.
- 9.2 For each failure to comply with the provisions of Section II, Compliance Program, of this Consent Order, the Respondent shall pay to the State of Michigan stipulated penalties in an amount of \$250 per violation per day for one (1) through seven (7) days of violation; \$500 per violation per day for eight (8) through fourteen (14) days of violation; and \$750 per violation per day for each day of violation thereafter. Stipulated penalties shall be paid within thirty (30) days after receiving a written demand made by the DEQ.
- 9.3 To ensure timely payment of any civil fines, penalties, and costs due under this Consent Order, the Respondent shall pay an interest penalty to the State of Michigan each time the Respondent fails to make a complete or timely payment. This interest penalty shall be based on the rate set forth at Section 6013(6) of the Revised Judicature Act, 1961 PA 236, as amended, MCL 600.6013(6), using the full increment of amount due as principal, and calculated from the due date for the payment until the delinquent payment is finally made in full.
- 9.4 The Respondent shall make all payments due under this Consent Order by certified or cashier's check made payable to the "State of Michigan" and mailed to the DEQ, Revenue Control Unit, P.O. Box 30657, Lansing, Michigan 48909-8157, or hand

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delivered to the DEQ, Revenue Control Unit, 1st Floor, Van Wagoner Building, 425 West Ottawa Street, Lansing, Michigan 48933. To ensure proper credit, all payments made pursuant to this Consent Order must include Payment Identification Number OWMRP_____ on the front of the check and/or in the cover letter with the payment.

- 9.5 The Respondent agrees not to contest the legality of the civil fine or the costs of surveillance and enforcement paid pursuant to this section. The Respondent further agrees not to contest the legality of any stipulated penalties or interest penalties assessed pursuant to this section but reserves the right to dispute the factual basis upon which a demand by the DEQ for stipulated penalties or interest penalties is made.
- 9.6 Liability for or payment of stipulated penalties pursuant to this Consent Order shall not preclude the State of Michigan from seeking injunctive relief or other relief for the Respondent's failure to comply with the requirements of this Consent Order and/or any permit(s) or license(s) required to comply with this Consent Order.

- X. **DISPUTE RESOLUTION** 10.1 Unless otherwise provided in this Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order. However, the procedures set forth in this section shall not apply to actions by the state of Michigan to enforce obligations of the Respondent that have not been disputed in accordance with this section. Engagement of a dispute resolution between the Parties shall not be cause for the Respondent to delay the performance of any compliance requirements or response activity. Any dispute that arises under this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The period of negotiations shall not exceed twenty (20) days from the date of written notice by any Party that a dispute has arisen, unless the time period for negotiations is modified by written agreement between the Parties. The dispute shall be considered to have arisen when one Party sends the other Party a written notice of dispute. If agreement cannot be reached on any issue within this twenty-

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(20-) day period, the DEQ shall provide a written statement of its decision to the Respondent and, in the absence of initiation of formal dispute resolution by the Respondent under Paragraph 10.3, the DEQ position, as outlined in its written statement of decision, shall be binding on the Parties.

10.2 If the Respondent and DEQ cannot informally resolve a dispute under Paragraph 9.1, the Respondent may initiate formal dispute resolution by requesting a review of the disputed issues by the Office Chief. This written request must be filed with the Office Chief within fifteen (15) days of the Respondent's receipt of the DEQ's statement of decision that is issued at the conclusion of the informal dispute resolution procedure set forth in Paragraph 9.1. The Respondent's request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation upon which the Respondent bases its position. Within fourteen (14) days of the Office Chief's receipt of the Respondent's request for a review of disputed issues, the Office Chief will provide a written statement of decision to the Respondent, which will include a statement of his/her understanding of the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting her/his position; and all supporting documentation relied upon by the Office Chief's review of the disputed issues. The Office Chief's review of the disputed issues may be extended by written agreement of the Parties.

10.3 The written statement of the Office Chief issued under Paragraph 10.3 shall be binding on the Parties unless, within fifteen (15) days after receipt of the DEQ's written statement of decision, the Respondent files a petition for judicial review in a court of competent jurisdiction that shall set forth a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Order. Nothing in this Consent Order affects the limitations on the timing of judicial review of the DEQ decision regarding the selection, extent, or adequacy of any response activity as provided for in Part 201.

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- 10.4 An administrative record of the dispute shall be maintained by the DEQ. The administrative record shall include all of the information provided by the Respondent pursuant to Paragraph 9.3, as well as any other documents relied upon by the DEQ in making its final decision pursuant to Paragraph 10.3. Where appropriate, the DEQ shall allow submission of supplemental statements of position by the Parties to the dispute.
- 10.5 In proceeding on any dispute, the Respondent shall have the burden of demonstrating on the administrative record that the position of the DEQ is arbitrary and capricious or otherwise not in accordance with law. In proceedings on any dispute initiated by the Respondent, the Respondent shall bear the burden of persuasion on factual issues.
- 10.6 Notwithstanding the invocation of dispute resolution proceedings, stipulated penalties shall accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Order, but payment shall be stayed pending resolution of the dispute. Stipulated penalties shall be paid within thirty (30) days after the resolution of the dispute. The Respondent shall pay that portion of a demand for payment of stipulated penalties that is not subject to dispute resolution procedures in accordance with and in the manner provided in Section IX, Fines, Costs, and Penalties.

XI. FORCE MAJEURE

- 11.1 The Respondent shall perform the requirements of this Consent Order within the time limits established herein unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the Respondent's obligations under this Consent Order in accordance with this section.
- 11.2 For the purpose of this Consent Order, "Force Majeure" means an occurrence or nonoccurrence arising from causes not foreseeable, beyond the control of, and without the fault of the Respondent, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the

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Respondent's diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the Respondent's actions or omissions.

- 11.3 The Respondent shall notify the DEQ, by telephone, within forty-eight (48) hours of discovering any event that causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or causes of delay, the measures taken by the Respondent to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay.
- 11.4 Failure of the Respondent to comply with the notice requirements of Paragraph 10.3, above, shall render this section void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of Paragraph 10.3.
- 11.5 If the Parties to this Consent Order agree that the delay or anticipated delay was beyond the control of the Respondent, this may be so stipulated and the parties to this Consent Order may agree upon an appropriate modification of this Consent Order. If the Parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X, Dispute Resolution, of this Consent Order. The burden of proving that any delay was beyond the reasonable control of the Respondent, and that all the requirements of this section have been met by the Respondent, is on the Respondent.
- 11.6 An extension of any given compliance date based upon a particular incident does not necessarily mean that the Respondent qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

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XII. GENERAL PROVISIONS

- 12.1 With respect to any violations not specifically addressed and resolved by this Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the Respondent to comply with the requirements of any state or federal law, including the NREPA and its rules.
- 12.2 Execution of the schedule contained in this Consent Order shall not be construed to waive, estop, or otherwise diminish the DEQ's right to seek or impose civil liability upon, and seek appropriate relief from, the Respondent for degradation of waters of the State and the designated uses thereof arising out of the failure of the Respondent to achieve a proper cleanup pursuant to this Consent Order.
- 12.3 This Consent Order does not constitute a warranty or representation of any kind by the DEQ that the response activities performed in accordance with this Consent Order or DEQ-approved work plans will result in the achievement of the remedial criteria established by law, or that the response activities will ensure protection of public health, safety, or the environment.
- 12.4 This Consent Order in no way affects the Respondent's responsibility to comply with any other applicable state, federal, or local laws or regulations including, without limitation, any corrective action or similar requirements applicable to the Site pursuant to the NREPA and its rules.
- 12.5 Nothing in this Consent Order is or shall be considered to affect any liability the Respondent may have for natural resources damages caused by the Respondent's ownership and/or operation of the Site. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.
- 12.6 The Parties agree that the terms and conditions of this Consent Order will be enforceable in circuit court. The Parties further agree that the appropriate venue for the enforcement

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of this Consent Order shall be the Circuit Court for Genesee County or Ingham County, State of Michigan, which courts shall also be appropriate for dispute resolution.

- 12.7 If any provision or authority of this Consent Order or the application of this Consent Order to any Party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other Parties or circumstances and the remainder of the Consent Order shall remain in force and shall not be affected thereby.
- 12.8 The provisions of this Consent Order shall be binding on the Respondent, the DEQ, and their successors and assigns. The Respondent shall give notice of this Consent Order to any prospective successor in interest prior to transfer of ownership of the Site property or any portion thereof and shall notify the DEQ of such proposed sale or transfer.

XIII. TERMINATION

- 13.1 This Consent Order shall remain in full force and effect until expressly terminated by a written Notice of Termination issued by the Office Chief. The Respondent may request that the Office Chief issue a written Notice of Termination at any time after achieving full compliance with this Consent Order. Such a request shall consist of a written certification that the Respondent has fully complied with all of the requirements of this Consent Order and has made payment of any fines, penalties, and costs required under this Consent Order. Specifically, this certification shall include:
- a. The date of compliance with each provision of the compliance program in Section II of this Consent Order and the date any fines, penalties, or costs were paid;
 - b. a statement that all required information has been reported to the District Supervisor;

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- c. confirmation that all records required to be maintained pursuant to this Consent Order are being maintained by the City; and
- d. additional relevant information requested by the Office Chief.

13.2 The Office Chief shall issue a written Notice of Termination unless the DEQ determines that the Respondent has not submitted the certification required under this section, has failed to submit the information specifically requested by the Office Chief, or has failed to comply with, or complete, all of the requirements of this Consent Order.

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XIII. SIGNATORIES

The undersigned CERTIFY they are fully authorized by the party they represent to enter into this Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it.

{OWNER/OPERATOR'S FULL LEGAL NAME}**DEPARTMENT OF ENVIRONMENTAL
QUALITY**

By: _____

Dan Wyant
Director

Name: _____

Title: _____

By: _____

Elizabeth M. Browne, Chief
Office of Waste Management and
Radiological Protection

Date: _____

Date: _____

APPROVED AS TO FORM:Bill Schuette
Attorney General**{INSERT NAME OF AAG ASSIGNED} {P_____}**Assistant Attorney General
Environment, Natural Resources, and
Agriculture Division
Department of Attorney General
Constitution Hall, 5th Floor, South Tower
525 West Allegan Street
Lansing, Michigan 48933

Date: _____

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, March 26, 2013 3:45 PM
To: Richard Benzie P.E. (BENZIER@michigan.gov); Donaldson, Kristina (DEQ); Jon Bloemker P.E. (BLOEMKERJ@michigan.gov)
Cc: Shekter Smith, Liane (DEQ)
Subject: FW: Flint Draft Response

At 1:30 today Mike Prysby and I attended an unplanned conference call between Director Wyant and Treasurer Dillon. Prior to the conference call I provided the director what I had put together at that point (see email below).

There was follow up discussion with the Director following the call and in addition to the response below he would like us to be prepared to discuss the following points:

1. Can we say to Treasury that KWA is a cost effective option?
2. Can we say to Treasury that DWSD is a cost effective option?
3. Regulatory authority to allow/prevent water system breakups and local vs. state decisions about associated costs
 - a. Besides Benton Township and Norton Shores/Fruitport what other systems have pulled out of a regional system and what were the DW regulatory considerations?
4. How do/can we assess the dollar value on the benefits of a DWSD Regional water system vs. the cost differential?
 - a. In the TYJT report, the status quo option for Flint with DWSD vs. KWA cost estimate differential is \$172 million.
5. What unanswered questions do we have about the DWSD options in the TYJT report?
 - a. 8/12 Blend
 - b. 12/8 Blend

I am still planning on a ODWMA meeting/conference call tomorrow morning at 9:00 to address the above and addend any additional comments before I provide a final response to the Director Wednesday afternoon in preparation for Thursday meetings.

Call me if you have any questions.

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, March 26, 2013 12:37 PM
To: Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ)
Cc: Willard, Veronica (DEQ); Shekter Smith, Liane (DEQ)
Subject: Flint Draft Response

Director Wyant,

In preparation for our call today with Treasurer Dillon's office, ODWMA has developed the following for consideration. We can provide any additional info you require during the meeting.

ODWMA has reviewed the materials developed by the consultant Tucker, Young, Jackson, Tull, Inc. (TYJT) for Treasury regarding the City of Flint and potential alternatives for public water supply. Based on our reviews, we have developed the following comments to this point in our analysis:

1. The TYJT report does not contain the full scope of the Karegnondi Water Authority (KWA) raw water supply system. TYJT concerns over raw water supply redundancy and reliability are addressed to the satisfaction of ODWMA under the full KWA proposal. Please note some portions of the overall project are being financed independently by the Genesee County Drain Commission.
2. There are significant differences in contract language between KWA and Detroit Water and Sewerage Department (DWSD) with respect to the contracted maximum day demand capacity.
 - a. Under a KWA contract, a "maximum day" capacity of 18 million gallons per day (MGD) would fully satisfy current demands of the City of Flint, without the need to supplement raw water capacity using the Flint River. (18 MGD, average over a 30 day period).
 - b. Under a DWSD model contract, a "maximum day" capacity, even at 18 MGD, would not satisfy the current demands for the City of Flint. (18 MGD, over any 24 hour period).
3. Restrictions in contracted capacity that would prevent the City of Flint from meeting peak demand requirements present potential limits to economic development within the City of Flint, including possible connection bans and water system extension bans. This information was previously conveyed to the City of Flint by ODWMA staff.
4. All contract options with DWSD that are considered semi-competitive with the KWA contract do not fully supply the City of Flint, and would require the City of Flint to meet a significant, if not majority, of its water demands by treating water from the Flint River. Continuous use of the Flint River at such demand rates would:
 - a. Pose an increased microbial risk to public health (Flint River vs. Lake Huron source water)
 - b. Pose an increased risk of disinfection by-product (carcinogen) exposure to public health (Flint River vs. Lake Huron source water)
 - c. Trigger additional regulatory requirements under the Michigan Safe Drinking Water Act (LT2ESWTR)
 - d. Require significant enhancements to treatment at the Flint WTP, beyond those identified in the TYJT report (see item X below).
 - e. Water Resource Division is evaluating potential impacts to NPDES wastewater discharge permits in downstream segments of the Flint River.
5. The TYJT report does not adequately address increased requirements and costs associated with using the Flint River as a significant source for the Flint WTP, which are not necessary under a Lake Huron source water scenario. This includes:
 - a. The need to provide softening treatment
 - b. Limitations on disposal options for lime softening sludge
 - c. Increased ozone capacity, UV disinfection
 - d. Additional backup power, more power required for Flint River operation
6. The Flint WTP must operate at some minimum level and within a range of flow rates to maintain treatment effectiveness. Currently that minimum level is 9 MGD. This level may be reduced with additional capital costs to modify the WTP, not addressed in the TYJT report.
7. Allowing Flint WTP to blend water with DWSD sets a new precedent that could pose future consequences with other DWSD customers.
8. Costs impacts to remaining DWSD customers would be similar under the proposed scenarios, only retaining 8 MGD of 30+ MGD total Flint/Genesee Co. demands, based on the following:

- a. Genesee County distribution system demands are pulling out of DWSD regardless of the decisions by Flint WTP
 - b. Flint's need to utilize the Flint River as a source
- 9. ODWMA anticipates cost savings under the KWA proposal will be leveraged to provide additional improvements to the City of Flint water distribution system, improving efficiency and providing additional cost benefits.
- 10. Major cost discrepancies in TYJT analysis
 - a. Engineering, Legal, Administration, Contingency – TYJT appears to have effectively double charged for these costs in their KWA estimates without adequate justification
 - b. Pumping facilities – TYJT cost estimate methodology does not appear to address localized market costs and does not distinguish fixed and variable costs in its comparison analysis.
- 11. Remaining DWSD customers in Lapeer County could potentially see water quality impacts as a result of Flint joining KWA.
 - a. City Lapeer
 - b. City of Imlay City

Additional response to the TYJT report has also been provided by Rowe Engineering to Flint EFM, Mr. Ed Kurtz.

ODWMA has continued to meet on a regular basis with KWA, Genesee County, and the City of Flint regarding these water supply proposals.

ODWMA will continue to provide any additional detailed analysis requested by Treasury or the DEQ Executive Office.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 23, 2015 4:31 PM
To: Pallone, Maggie (DEQ); Shekter Smith, Liane (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Benzie, Richard (DEQ); Thelen, Mary Beth (DEQ)
Subject: Fwd: DRFAT_Advisory
Attachments: DRAFT_Lead Advisory.docx; ATT00001.htm

FYI from city of Flint.

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: Howard Croft <hcroft@cityofflint.com>
Date: September 23, 2015 at 4:25:48 PM EDT
To: "Henry, James" <jhenry@gchd.us>
Cc: "Mike Prysby (DEQ)" <prysbym@michigan.gov>, "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>, Natasha Henderson <nhenderson@cityofflint.com>, "Flint Mayor" <dwalling@cityofflint.com>, Sean Kammer <skammer@cityofflint.com>, Jason Lorenz <jlorenz@cityofflint.com>
Subject: DRFAT_Advisory

Jim,

As a follow up to our earlier conversation, here is a brief advisory draft that we put together that still needs comments and information from the Health Dept and DEQ. I have just spoken to Mike Prysby of the DEQ and he will have their team review and make comments prior to adoption of a final version.

The GFHC group has requested the opportunity to see our final copy when it is ready, I have stamped this as a draft and will keep it that way until there is agreed upon content and the City Administrator has approved it.

Thank you,

--

Howard Croft

Public Works Director
City of Flint
1101 S. Saginaw Street
Flint, MI 48502
PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Public Health Advisory Regarding Lead in Drinking Water

The City of Flint is issuing a Public Health Advisory for residents to be aware of lead levels in drinking water. While the City is in full compliance with the Federal Safe Drinking Water Act, this advisory is being issued as part of a public information campaign to ensure that everyone takes note that no level of lead is considered safe.

Lead contamination can leach into water from a home's lead water service lines, lead solder, and leaded plumbing materials including fixtures, faucets, and fittings. Older service lines with pipes and fixtures installed before 1986 can sometimes be more susceptible to lead issues due to materials used in the home such as lead based paint and lead pipes. This message is meant as a precaution to residents and does not mean that all homes in the City will experience the same issue.

In an effort to minimize any potential risk, the City of Flint Public Works Department advises the public to take the following precautions:

- Flush water for at least five minutes prior to use.
- Only use cold water for cooking and drinking.
- Have your water tested (see information below).

For more specific questions about lead related issues please visit the Genesee County Health Department website at www.gchd.us. The City of Flint is working proactively along with the County Health Department, the Michigan Department of Environmental Quality, and the U.S. Environmental Protection Agency to improve the water system throughout the City.

The City's Utilities Division continues to offer free water testing by calling the Water Treatment Plant at 810-787-6537 and pressing #1 after prompted or by emailing flintwater@cityofflint.com.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, October 09, 2015 5:10 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: Devereaux, Tracy Jo (DEQ)
Subject: Preliminary and deliberate information not subject to FOIA - Daily Update 10/9

Action item #1

Held conference call with DHHS and City of Flint to identify the universe of schools and identify facility priority criteria

Action Item #2

Call with DLARA to provide 3 high priority facilities to pilot the plumbing assessment and testing protocol.

Action Item #20

Call with City DPW Director H. Croft confirmed that 30% of data conversion is done. Asked to prioritize school and childcare facility addresses regarding potential for lead service lines.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, October 09, 2015 5:04 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Subject: Preliminary and deliberate information not subject to FOIA FW: Flint Restaurants and Retail Food Stores

Here's what was going on yesterday. We need to let them know to go through the lab directly.

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: Thursday, October 08, 2015 5:25 PM
To: 'Howard Croft'; Henry, James
Cc: Hallwood, Dawn
Subject: RE: Flint Restaurants and Retail Food Stores

It sounds like from the meeting I just got out of the Lab would prefer to have the restaurants contact them directly. Let's touch base again tomorrow. We'll have to see if there is an easy and convenient way to distribute sample bottles and get them to the lab for analysis.

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: Howard Croft [<mailto:hcroft@cityofflint.com>]
Sent: Thursday, October 08, 2015 3:58 PM
To: Henry, James
Cc: Busch, Stephen (DEQ); Hallwood, Dawn
Subject: Re: Flint Restaurants and Retail Food Stores

Jim,

Let me look into the best location to handle that, we have been storing bottles at City Hall as well and could distribute from the DPW building.

On Thu, Oct 8, 2015 at 3:13 PM, Henry, James <jhenry@gchd.us> wrote:

Howard,

GCHD met with the state, MDEQ and MDA,(Agriculture)today regarding recommendations for restaurants and retail food stores that use Flint water. One recommendation will be to sample water and respond appropriately. There's approximately 400 locations (½ are licensed by the state) This will be a recommendation and we do not anticipate that all will sample.

Would it be ok for them to pick up a bottle at the water plant and return the sample w/payment to MDEQ lab back to the water plant? The water plant would then ship them off for analysis with the others.

GCHD and state wants to send out the recommendations asap. I'll copy you with the final draft of the recommendations.

Jim Henry RS, MBA
Environmental Health Supervisor
Genesee County Health Department www.gchd.us
630 S. Saginaw St., Suite 4
Flint, MI 48502-1540
Phone (810) 257-3618 Fax (810) 257-3125

E-mail jhenry@gchd.us



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For a copy of the Health Department's Notice of Information Practices, contact the Health Department or visit the Health Department's website at <http://www.gchd.us/>

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

Sent: Thursday, October 8, 2015 5:41 AM

To: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Dayne Walling; donna. cole; edwardsm; Gerald (Jed) Natzke; Howard Croft; Henry, James; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith;

larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Michael Wright; Mike Lane; Mike Prysby (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; schock.michael@epa.gov; Sean Kammer; Stephen Busch (DEQ); Warren Green; John Monsees; Kevin Keane

Subject: Re: TAC Team Summary 10_7_15

All,

Please find attached, the summary of Wednesday's meeting.

Thank you,

On Wed, Oct 7, 2015 at 9:42 PM, Howard Croft <hcroft@cityofflint.com> wrote:

All,

I want to personally thank everyone for participating in today's meeting, it is encouraging to see the commitment that exists to address the concerns around health. I apologize for the poor phone reception we experienced today, I will have that corrected at the next meeting.

I am sending a summary of today's meeting and have attempted to chronicle the highlights or major points that we discussed. I have also included an electronic version of Marc Edwards presentation and will forward any other documents that are requested.

Please look for continued communication from me as we work to move forward as fast as possible. I expect to have November and December dates selected very soon and will maintain the stream of information to this team as it becomes available.

Please do not hesitate to email or call me with any questions or requests.

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

Howard Croft

Public Works Director

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--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street
Flint, MI 48502
PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, October 26, 2015 5:04 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov)
Subject: Preliminary and deliberative - Daily update 10/26

Numbering is based on the draft list.

12. Contact city of Flint for Service Line Record status update and obtain a copy of the records to date
Obtained approximately 10,895 records from City's GIS system regarding service line index cards and extracted into a table format for additional data review. Data review has been initiated by Lansing District staff.

16. Confirm plumbing assessment and sampling is scheduled for Brownell K-2 STEM Academy and Eisenhower Elementary.

DLARA and DEQ staff tentatively plan to conduct plumbing assessments at Brownell K-2 STEM Academy and Eisenhower Elementary on Friday 10/30. DLARA staff will contact Flint school facility administrator to confirm date and approximate times.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 27, 2015 4:55 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov)
Subject: Preliminary and Deliberative - Daily Updates 10/27

Action Step 12: Contact city of Flint for Service Line Record status update and obtain a copy of the records to date. Staff were only able to cross reference 46 of the 326 historical lead and copper monitoring with the service line index card information, 10,895 records.

Action Step 7: Meet with DHHS and discuss all lead education material for schools
 &

Action Step 14: Develop childcare facility guidance or review DHHS related materials
 DEQ met with DHHS staff to review and further develop guidance and incorporate water exposure information. Guidance is being provided by DHHS specific to the County emergency order and separate guidance for statewide use will also be developed.

? Action Step 6: Meeting(s) with school staff/management

DEQ and DLARA staff met and reviewed outlet/tap materials to correlate with sample results. Contacted Jim Henry, Genesee County Health Dept. to confirm location of screening samples. Draft write up to be completed by DEQ staff on 10/28.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, October 16, 2015 1:44 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Cc: prysbym@michigan.gov; cookp@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)
Subject: Preliminary and Deliberative, Not Subject to FOIA - 10/19 ODWMA Action Steps - Draft
Attachments: ODWMA-ActionSteps-10-19-draft.docx

Liane,

See the attached draft list and provide and edits/comments. If you are not back by 4:00, I will get the list to George and the team. Thanks.

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

PRELIMINARY AND DELIBERATIVE – NOT SUBJECT TO FOIA

Action Steps for week of 10/19/2015

1. Develop Letter to Schools
2. Finalize Sampling Protocol
3. Confirm school sampling logistics
4. Meeting(s) with school staff/management
5. Complete Non-Transient Non-Community Water Supply letter
6. Meet with DHHS and discuss all lead education material for schools
7. ODWMA staff observe a DLARA plumbing assessment
8. Develop sample form and chain of custody document
9. Provide Director with revised Part 54 language
10. Review CCT plan and get any EPA comments
11. Review construction permit application and issue construction permit for phosphate equipment.
12. Review Standby Operation of Flint Water Treatment Plant with City of Flint.
13. Provide City of Flint updated monitoring schedule based on DWSD/GLWA service.
14. Contact City and County daily for DWSD connection status updates.
15. Work with KWA and other agencies to address bottleneck issues.
16. Verify City of Flint distribution operations under DWSD/GLWA service.
17. Confirm recommendations for updated 2004 letter to EPA.
18. Contact City of Flint for Service Line Record status update and obtain a copy of the records to date.
19. Provide DHHS with any available cross-reference information.
20. Develop childcare facility guidance or review DHHS related materials.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 4:47 PM
To: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)
Subject: Preliminary and Deliberative, Not Subject to FOIA - Daily Update

Liane,

Here my list for George,

Item 1. Preliminary list completed, circulated to HHS, and has been provided to DLARA to begin plumbing assessments. The list will remain active incase of additional schools requesting assessment/testing.

Item 2. See Item 1. DLARA to coordinate with Flint Schools on access for Plumbing Assessments. Tap coding identification from EPA guidance to be provided to DLARA.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 9:41 AM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)
Subject: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft
Attachments: School-Priority-List-Preliminary.xlsx

George,

Attached is the draft list prioritizing schools for plumbing assessment and lead sampling. At this point the City has not forwarded any additional requests for this type of analysis beyond the original request by the Flint Public Schools. As any additional requests are received this list will be updated.

Criteria for prioritization included,

- Zip Code
- Grades levels
- Lead Service Line Materials
- Screening Test results
- Plumbing Complexity

Please share this with Linda at DHHS for concurrence before providing to Joe Madziar, Plumbing Division, DLARA for implementation scheduling. Thanks.

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

Flint School and Child Care Plumbing Assessment and Lead Testing List (PRELIMINARY & DELIBERATIVE - NOT SUBJECT TO FOIA)

School/Childcare Name	Address	City	Zip	ID	Lead Service Line	Screening Level	Population	Grades	Complex Plumbing	Contact Name	Phone	Email
1 Freeman Elementary	4001 Ogema Street	Flint	48507	01320	No - 4" CI	101		K-6	Yes	Anita Miller, Principal		
2 Eisenhower Elementary	1235 Pershing Street	Flint	48503	01098	No - 4" CI	28, 16		K-6	Yes	Rachel Turner, Principal		
3 Brownell K-2 STEM Academy	6302 Oxley Drive	Flint	48504	01916	No - 4" CI	31		K-2	Yes	Darryl Grace, Principal		
4 Doyle Ryder Elementary	1040 North Saginaw Street	Flint	48503	03129	No - 4" CI	9, 7, 4		K-6	Yes	Robert Bueche, Principal		
5 Pierce Elementary	1101 West Vernon Drive	Flint	48503	03033	No? - 8" DI	8, 3, 1		K-6	Yes	Shalonda Byas, Principal		
6 Central Kitchen	305 Walnut	Flint	48503	N/A	No - 2" Cu	9, 6, 4		N/A	Yes			
7 Durant-Tuuri-Mott Elementary	1518 University Avenue	Flint	48504	00974	No - 6" CI	5, 2, 1		K-7	Yes	Shelly Umphrey, Principal		
8 Neithercut Elementary	2010 Crestbrook Lane	Flint	48507	02670	No - 4" CI	2, 1		K-6	Yes	Debra Jackson-Noble, Principal		
9 Potter Elementary	2500 North Averill Avenue	Flint	48506	03108	No - 4" CI	1, 0		K-7	Yes	Gretchen Shafer, Principal		
10 Holmes 3-6 STEM Academy	6602 Oxley Drive	Flint	48504	01917	No - 6" CI	2, 0, 0		3-7	Yes	Anna Johnson, Principal		
11 Southwestern Classical Academy	1420 West Twelfth Street	Flint	48507	03554	No - 6" DI	15, 9, 7		7-12	Yes	Cheryl Tate, Principal		
12 Northwestern High School/ALA	G-2138 West Carpenter Road	Flint	48505	02777 / 05950	No - 8" DI	10, 4, 2		7-12	Yes	Tim Green/Eddie Thomas, Principals		
13 Administration Building	923 East Kearsley Street	Flint	48503	N/A	No - 4" CI	5, 3, 2		N/A	Yes			

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, October 09, 2015 12:40 PM
To: Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ)
Cc: Rennaker, Joanne (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ)
Subject: Preliminary and Deliberative not subject to FOIA RE: Got dates?

Already done. It had been provided previously and Heather has it now.

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: Shekter Smith, Liane (DEQ)
Sent: Friday, October 09, 2015 12:33 PM
To: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Rennaker, Joanne (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ)
Subject: RE: Got dates?

I'm assuming that you folks in the district will be compiling this for Brad.

Any estimate on a time frame?

From: Wurfel, Brad (DEQ)
Sent: Friday, October 09, 2015 12:08 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Cc: Krisztian, George (DEQ)
Subject: FW: Got dates?

I need a comprehensive picture of lead and copper tests, please. At the plant tap, in the lines, figures we got from the city during the L&C rule tests. Everything. Thank you.

b

From: Erb, Robin [<mailto:rerb@freepress.com>]
Sent: Friday, October 09, 2015 11:13 AM
To: Wurfel, Brad (DEQ)
Subject: RE: Got dates?

Hey Brad,

'Just making sure you saw this. Can you help me out? I know it's probably been a hellish couple of weeks, but for what it's worth – weekend's almost here....

Robin

From: Erb, Robin
Sent: Thursday, October 08, 2015 3:28 PM
To: 'WurfelB@michigan.gov' <WurfelB@michigan.gov>
Subject: Got dates?

Hey Brad,

I know we've talked about all the testing that was done on the Flint water. I'd like to drive home how much testing was done.

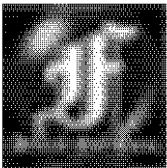
Can you give me a time line of the tests? I believe there were the 7 tests done from the source, and then the two supplemental tests that confirmed ppb lower than 15 (6 and 11).

I know, I know. You've probably explained this 422 time to 422 different reporters (I'm guessing). Can we go over one more time so we have it nailed down on a time line? If it's easier, a phone call works too – 313-222-2708.

Robin

Robin Erb
Medical Writer
Desk: 313-222-2708
Metro Desk: 313-222-6601
rerb@freepress.com

Follow me on Twitter: @FreepHealth



www.freep.com

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, October 16, 2015 4:07 PM
To: Pallone, Maggie (DEQ); Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ)
Cc: Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: RE: Action Steps for the week of October 19th
Attachments: ODWMA-ActionSteps-10-19-draft.docx

Attached are the draft ODWMA action steps for next week, pending Liane's review.

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: Pallone, Maggie (DEQ)
Sent: Friday, October 16, 2015 2:55 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ)
Cc: Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: RE: Action Steps for the week of October 19th

Additional action items:

After Action Review panel
 Staff hiring plan
 \$1 million for lab billing code
 Introduce Part 54 legislative changes
 Finalize FY 17 budget request

Thanks George.

Maggie

From: Krisztian, George (DEQ)
Sent: Friday, October 16, 2015 8:50 AM
To: Shekter Smith, Liane (DEQ) <SHEKTERL@michigan.gov>; Busch, Stephen (DEQ) <BUSCHS@michigan.gov>; Cook, Pat (DEQ) <COOKP@michigan.gov>; Prysby, Mike (DEQ) <PRYSBYM@michigan.gov>; Wurfel, Brad (DEQ) <WurfelB@michigan.gov>; Pallone, Maggie (DEQ) <PalloneM@michigan.gov>; Tommasulo, Karen (DEQ) <TommasuloK@michigan.gov>
Cc: Shaler, Karen (DEQ) <SHALERK@michigan.gov>; Thelen, Mary Beth (DEQ) <THELENM2@michigan.gov>; Wyant, Dan (DEQ) <WyantD@michigan.gov>; Sygo, Jim (DEQ) <SygoJ@michigan.gov>

Subject: Action Steps for the week of October 19th

Importance: High

I need to have 25 additional action steps for the week of October 19th. I would like at least 15 steps from Liane's group and 10 from exec. Please submit your steps to the whole group by 4:00 PM today.

Given how tight everyone's schedule is we will try to do this electronically. If it works, then we will make this a weekly deadline. If it doesn't work then we will have weekly meetings.

Thank you!

George

George L. Krisztian
Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
Desk ph (517) 284-6719
Cell ph (517) 204-0381

PRELIMINARY AND DELIBERATIVE – NOT SUBJECT TO FOIA

Action Steps for week of 10/19/2015

1. Develop Letter to Schools
2. Finalize Sampling Protocol
3. Confirm school sampling logistics
4. Meeting(s) with school staff/management
5. Complete Non-Transient Non-Community Water Supply letter
6. Meet with DHHS and discuss all lead education material for schools
7. ODWMA staff observe a DLARA plumbing assessment
8. Develop sample form and chain of custody document
9. Provide Director with revised Part 54 language
10. Review CCT plan and get any EPA comments
11. Review construction permit application and issue construction permit for phosphate equipment.
12. Review Standby Operation of Flint Water Treatment Plant with City of Flint.
13. Provide City of Flint updated monitoring schedule based on DWSD/GLWA service.
14. Contact City and County daily for DWSD connection status updates.
15. Work with KWA and other agencies to address bottleneck issues.
16. Verify City of Flint distribution operations under DWSD/GLWA service.
17. Confirm recommendations for updated 2004 letter to EPA.
18. Contact City of Flint for Service Line Record status update and obtain a copy of the records to date.
19. Provide DHHS with any available cross-reference information.
20. Develop childcare facility guidance or review DHHS related materials.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 16, 2015 5:20 PM
To: Pallone, Maggie (DEQ); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'
Cc: Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Sygo, Jim (DEQ) (SygoJ@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov); Wyant, Dan (DEQ)
Subject: RE: Draft FAQ
Attachments: FAQ-Flint Customer Tap water lead levels-draft.docx

A draft FAQ document as requested is attached for editing and comment.

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

Frequently Asked Questions about Customer Tap water lead levels in the City of Flint - DRAFT

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 is a treatment technique rule. This was done because lead contamination of drinking water often results from corrosion of the plumbing materials belonging to water system customers. Instead of setting 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 enough to replace lead service lines under their control. The current rule sets an 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 service line pipe, lead solder, and leaded plumbing materials including fixtures, faucets, and fittings.

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 rounds 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 rounds, followed by annual sampling for three additional years, then one round every three years. For six month rounds compliance samples can be collected any time during that period. 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 to collect the sample generally 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 rounds were collected in 1992. Sampling resumed with two six month rounds in 1997 following the installation of Optimized Corrosion Control Treatment by DWSD. A six month round 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 obtain 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 rounds 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 Tier requirements 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 may not be 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 rounds 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 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 at home?

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. Anytime the 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 heavy 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 will probably 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 would still take several years complete this work.

What will it cost to have lead service lines replaced?

Average costs have ranged from \$2,000 - \$8000. 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 over \$60 million.

Who is responsible for replacement of lead materials?

Replacement of service pipes on private property and any leaded 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 risk. Only full lead service line replacement has been demonstrated effective in achieving long-term reductions in drinking water lead levels.

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

Monitoring of lead blood 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 lead service line or household leaded plumbing materials are encouraged to be screened for blood lead level monitoring through their local county health department.

Lead blood level monitoring is overseen statewide by the Michigan Department of Health and Human Services. Their review of lead blood 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 lead blood levels in comparison with levels reported for the previous three years. This suggests the recent changes in source and treatment by the City of Flint water system have not increased lead exposure.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, October 16, 2014 11:54 AM
To: 'Crooks, Jennifer'
Subject: RE: DRAFT Flint Controlled Correspondence

I have no additional comments. The content of this letter is adequate.

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: Thursday, October 16, 2014 10:59 AM
To: Poy, Thomas
Cc: Busch, Stephen (DEQ)
Subject: DRAFT Flint Controlled Correspondence
Importance: High

Please review the control response letter attached. I would like to get this to Eric today for formatting and final preparation for the Tinka's signature.

Thank you!!

Jennifer

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 02, 2015 1:34 PM
To: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Subject: RE: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!

I had already started over lunch and am half way through.

First, we want to be very clear that the source of this lead is not from the City's source water or the treated water from the City's water treatment plant. Treated water from the plant continues to show no detectable level of lead according to state analysis. The Flint public water distribution system is not constructed of lead piping materials. However lead materials were used decades ago for service lines, and household plumbing, both of which are not part of the public water system. Property owners who have failed to replace such materials continue to expose themselves to at least some level of lead.

The DEQ regulates the impact of the City's water on leaching such metals to help limit this exposure. The City has continued to comply with the federal Action Level standard for lead since regulations became effective in 1991. The state's monitoring program, which uses certified laboratories and a standardized, federal testing protocol, looks specifically at the homes in communities most likely to experience lead problems.

While Dr. Edwards is well respected in this field, we are not aware of any certification for his university's research laboratory for metals analysis, and it does not appear he has disclosed this fact. It is also disappointing that he has not fully disclosed information regarding each of these test results. What instructions were provided to residents for collection the sample, plumbing conditions within the home, sample preservation, chain of custody documentation, etc. In many cases it appears samples were collected in a manner that is not consistent with Safe Drinking Water Act requirements. His finding of lead in and of itself is not surprising as the City has for decades documented that fact that over 15,000 customers have at least some lead materials.

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: Benzie, Richard (DEQ)
Sent: Wednesday, September 02, 2015 1:32 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Subject: RE: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!

Here are my suggested edits in an attached word document. I thought we should probably just draft a single response so I am circulating it to you three before we reply to Brad.

From: Wurfel, Brad (DEQ)

Sent: Wednesday, September 02, 2015 12:12 PM

To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)

Subject: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!

We are aware that Virginia Tech researchers are now testing water at various Flint homes for lead levels in their plumbing.

First, we want to be very clear that the lead issue in Flint, to the extent there is one, is not from the source water or the plant or even the transmission lines. The river has no detectable levels of lead in it, and treated water from the plant has not detectable levels of lead in it. The issue is how, whether, and to what extent the water is interacting with lead plumbing in people's homes.

It does not appear their research lab is certified, and we can't speak to the whatever sampling methods are being employed to achieve these results. The results reported so far fail to track with any of the lead sampling done by the DEQ for the past 25 years (since 1991), or the blood lead levels testing regularly conducted by the state department of community health. That said, we do appreciate that Virginia Tech's team is working on this issue because it brings the public spotlight on an important fact: if you have lead water pipes in your home, or a lead service connection to the city system, it is very likely you are ingesting some level of lead. That's just a fact, and in the City of Flint that fact affects 15,000 or more residences.

The state's monitoring program, which uses certified laboratories and a standardized, federal testing protocol, looks specifically at the homes in communities most likely to experience lead problems. Our results, obtained from two separate rounds of testing over the past year, concluded that the mean average of lead in Flint drinking water, meets state and federal safe drinking water standards.

That said, the state is pushing Flint to 'optimize' its water, which means addressing additives that can minimize the extent to which the water interacts with lead plumbing in homes. While statute allows several years for an operator actually undertake this process – Detroit took five years to complete its water optimization work – we are encouraging Flint water system operators to take these steps immediately and we are encouraged by the conversation so far.

Any resident who has concerns about lead in their drinking water should have their water tested and get professional consultation on how to address it. The leading cause of lead poisoning is known to be lead paint and, in some areas, environmental legacy hot spots where lead is present in soils. However, I will say it again: when homes are fitted with lead plumbing pipes, homeowners should assume there is some varied level of interaction between water and pipes that means exposure.

From: Ronald Fonger [<mailto:RFONGER1@mlive.com>]

Sent: Wednesday, September 02, 2015 11:34 AM

To: Wurfel, Brad (DEQ)

Cc: Kristin Longley; Bryn Mickle
Subject: lead in flint water

Brad:

I left a message with Mike Prysby on Tuesday, Sept. 1, but wanted to reach out to you also because of stories we are working on about the extent to which lead is becoming an issue in Flint drinking water.

Today, Sept. 2, researchers at Virginia Tech posted the results on an experiment with Flint water online.

The report concludes that Flint River water leaches much more lead from plumbing than does Detroit.

"On average, Detroit water is 12 times (or 12X) less corrosive than the Flint River water currently in use ... This is creating a public health threat in some Flint homes that have lead pipe or lead solder," the report says.

An earlier post by the same researchers says that initial water tests show "a serious lead in water problem" in Flint, partly because Flint River water is so corrosive to pipes.

Given the state's role in oversight of the city's drinking water system through DEQ and its overall oversight by state emergency managers during the past several years, I wanted to make sure I'm reaching out to the right person to respond to this information.

Could you let me know who that is?

I expect to post the first story about the experiment today and expect the issue will be getting more attention as the VT study of 300 water test kits from Flint is completed.

Thanks,

Ron Fonger
MLive Media Group
Reporter

mobile 810.347.9963
email rfonger1@mlive.com
address 540 S. Saginaw St. #101, Flint MI 48502

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, December 11, 2014 4:03 PM
To: Benzie, Richard (DEQ)
Cc: Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: RE: Draft Violation Notice for comment

We will try and work that in. I will get something to you tomorrow.

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

From: Benzie, Richard (DEQ)
Sent: Thursday, December 11, 2014 1:35 PM
To: Busch, Stephen (DEQ)
Cc: Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: RE: Draft Violation Notice for comment

Steve,

Will there be a cover letter with this VN? Would it be appropriate to mention the amount of cooperation and collaboration that has already occurred in responding to this matter?

Your closing on the VN mentions that we appreciate their cooperation in resolving this matter, but there is no mention of what cooperation has already occurred. I think it would be useful to mention that there has been significant collaboration between the district and the city and that some improvement (reduced levels) has already been achieved. A cover letter could mention this fact, demonstrating to the area legislators that we are not in an adversarial relationship with the city.

Richard

From: Busch, Stephen (DEQ)
Sent: Wednesday, December 10, 2014 5:11 PM
To: Wurfel, Brad (DEQ); Datema, Maggie (DEQ); Shekter Smith, Liane (DEQ)
Cc: Benzie, Richard (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: Draft Violation Notice for comment

Attached is a draft violation notice to the City of Flint regarding the exceedance of the drinking water standard for total trihalomethanes (TTHM).

If you have any comments please let me know by Friday, we would like to mail this out by Monday at the latest. An electronic copy of the signed letter will be provided to Maggie for forwarding to legislative members in the Flint area.

If you have any questions, please contact me directly.

Stephen Busch, P.E.
 Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance
MDEQ
517-643-2314

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 30, 2015 7:09 AM
To: Benzie, Richard (DEQ)
Cc: Philip, Kris (DEQ); Cook, Pat (DEQ); Shekter Smith, Liane (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: RE: Flint Briefing - Draft 9-29-15
Attachments: Flint Briefing - Draft 9-30-2015.dotx.docx

I made edits last night to try and get closer to one page. The content was a bit heavy on regulations and I have reordered things to line up the regulatory aspect with what has occurred with the City.

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: Benzie, Richard (DEQ)
Sent: Tuesday, September 29, 2015 6:29 PM
To: Busch, Stephen (DEQ)
Cc: Philip, Kris (DEQ); Cook, Pat (DEQ); Shekter Smith, Liane (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Flint Briefing - Draft 9-29-15

Steve,

Here's an updated version where I deleted some things, corrected others, changed the order of a couple of things and inserted the last section that I think is particularly applicable in Flint.

This is a draft. Please do not distribute or cite it elsewhere. If you see something that is wrong or you know something else should be included, let me or Steve know before 9 AM tomorrow.

Richard

Meeting/ Policy Briefing Template

Policy or Meeting Topic

City of Flint and Lead Concerns in Customer Tap Water

Staff Lead**Purpose of Meeting/ Policy Paper****Decision Points****Recommendation****Key Stakeholders Positions**

EO:

Dept:

Legislature:

Outside Interest:

Current Press/ Communications**Executive Summary****Background/ Attachments**

Lead can pose health risks to anyone, but there are heightened risks for pregnant women, infants, and children. Lead in drinking water is regulated under the Safe Drinking Water Act. As there is no safe level of exposure to lead, EPA has established a non-enforceable goal of zero for lead concentrations in drinking water. For most contaminants, EPA sets an enforceable regulation, a maximum contaminant level (MCL), based on this goal. However for lead, EPA instead established a treatment technique rather than an MCL because the source of lead contamination in drinking water is most often a result from corrosion of plumbing materials belonging to water system customers and not under the ownership or control of the public water system.

This is also the case in the City of Flint. Water from the City of Flint Water Treatment Plant using the Flint River has been analyzed and shown to contain no detectable level of lead. However, in a 2011 EPA survey, the City of Flint reported that approximately 18,000 out of 33,000 total active service connections used lead service line materials. As more than half of the City's 550 miles of water mains are more than 75 years old, the use of lead material in service connections was common at that time. The City owns a small portion of each service connection from the public water main to a curb stop valve at the edge of the Right-of-Way. The remaining portion is owned by, and the responsibility of each individual water customer.

Therefore, the treatment technique regulation for lead, the Lead and Copper rule (LCR), requires water systems to control the corrosivity of their water. The regulation also requires systems to collect tap samples from sites served by the system that are more likely to have plumbing materials containing lead. If more than 10% of tap water samples exceed the lead action level (AL) of 15 parts per billion (ppb), then water systems are required to take additional actions which can include:

- Taking further steps to optimize their corrosion control treatment (for water systems serving 50,000 people that have not fully optimized their corrosion control).

Meeting/ Policy Briefing Template

- Educating the public about lead in drinking water and actions consumers can take to reduce their exposure to lead.
- Replacing the portions of lead service lines under the water system's control if ongoing lead AL exceedance occurs following implementation of optimized corrosion control treatment (OCCT).

The City of Flint has conducted lead monitoring at customer taps since 1992 and has never exceeded the 15 ppb lead AL, either as a customer of the Detroit Water and Sewerage Department (DWSD), or while operating the Flint Water Treatment Plant (WTP) using the Flint River. Following this May 2014 change from DWSD to the Flint WTP using the Flint River, the City conducted two six month periods of expanded lead monitoring at customer taps to demonstrate their lime softening treatment process optimized corrosion control. This sampling concluded on June 30, 2015. While both periods continued to comply with the lead AL, lead levels did not demonstrate OCCT, and the City must now install additional treatment to meet this optimization requirement.

Under LCR requirements, the City could take up to 4 years to study, recommend, install, and implement treatment. However, the City has committed to an accelerated schedule in order to implement treatment as soon as possible. The Flint WTP is expected to start using a new water source, Lake Huron from the Karegnondi Water Authority, in late 2016. When this occurs the Flint WTP will continue to provide OCCT, and again conduct two six month periods of expanded monitoring in compliance with LCR requirements.

OCCT will help minimize, but cannot eliminate lead exposure from customer tap water. Removal of lead materials is the only means to eliminate such exposure. However, replacement is a shared responsibility between the City and its customers, as research has shown that partial lead service line replacement can increase rather than decrease lead exposure. At an estimated average cost of \$4,000 to replace each service line, the total cost to complete such work could easily exceed \$60 million and would likely take many years to complete. At this time any effort by the City of Flint to replace lead service lines would be voluntary since the City continues to comply with the LCR lead AL.

In addition, it is widely recognized that drinking water is not a primary source of lead exposure and poisoning. Recent health studies show no direct correlation between water sampling results and blood lead level concentrations measured in children.

EPA promulgated the LCR in 1991 and revised the regulation in 2000 and 2007. A long term revision to the LCR is currently underway. A national workgroup in August provided a report with recommendations for revisions to the LCR. It is worth noting that this report's recommendations did not include changes to existing LCR sample collection protocols, despite concerns by some organizations that these protocols do not capture representative exposure levels. EPA must now consider whether to promulgate any of these recommended changes into law.

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, January 14, 2015 9:01 AM
To: Prysby, Mike (DEQ); Cook, Pat (DEQ)
Subject: RE: Flint THM Operational Evaluation Report Draft

Mike,

We should not be calling or considering this a draft. We requested a report be submitted by 11/28/2014, and after that point it should be considered the final version of what was submitted for that period.

The TTHM violation that followed in December requires a separate operational evaluation in response to the results from that period. While the City can use some information from the previous operational evaluation report, each one is a separate report as required under Rule 719I.

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

From: Prysby, Mike (DEQ)
Sent: Wednesday, January 14, 2015 8:15 AM
To: Busch, Stephen (DEQ); Cook, Pat (DEQ)
Subject: FW: Flint THM Operational Evaluation Report Draft

I reviewed Flint's draft OEL report; and jotted down some preliminary comments (nothing overly critical). I will call Jeff later today to go over what I have. I plan to compile my comments and send an official punch-list to Jeff within the next week. If you have any comments/questions....let me know and I will add them to the list. I will plan to meet with the city and LAN soon afterwards to discuss completion of the OEL report and schedule of implementation of TTHM reduction measures.

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

From: Hansen, Jeff [<mailto:jrhansen@lan-inc.com>]
Sent: Tuesday, January 13, 2015 3:22 PM
To: Prysby, Mike (DEQ)
Subject: FW: Flint THM Operational Evaluation Report Draft

Hi Mike,

I figured it was about time to follow up and see if you had put together any review comments on the draft report for Flint?

Jeffrey R. Hansen
Senior Project Manager

From: Hansen, Jeff
Sent: Monday, December 01, 2014 4:18 PM
To: Mike Prysby; 'buschs@michigan.gov'; 'cookp@michigan.gov'
Cc: Brent Wright (bwright@cityofflint.com); Daugherty Johnson (djohnson@cityofflint.com); hcroft@cityofflint.com; jwgreen@lan-inc.com; Matta, Samir; mglasgow@cityofflint.com
Subject: Flint THM Operational Evaluation Report Draft

Mike,

In response to your letter dated 9/10/14 and our meeting on 11/07/14 please find attached a draft of the OER for your review and comment.

Jeffrey R. Hansen
Senior Project Manager



**Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY

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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, August 24, 2015 10:33 AM
To: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Cc: Devereaux, Tracy Jo (DEQ)
Subject: RE: LeeAnn Walters Draft

I'm good with dropping the plumbing paragraph. The breakdown looks fine to me and I didn't see any other issues.

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: Benzie, Richard (DEQ)
Sent: Monday, August 24, 2015 9:38 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Cc: Devereaux, Tracy Jo (DEQ)
Subject: RE: LeeAnn Walters Draft

In the first paragraph under pH, I would eliminate the word out from "out in the distribution system" and change the verb in the last sentence from "is" to "are."

From: Shekter Smith, Liane (DEQ)
Sent: Friday, August 21, 2015 6:01 PM
To: Busch, Stephen (DEQ)
Cc: Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ)
Subject: RE: LeeAnn Walters Draft

Revised. Please review. Thanks.

Dear Ms. Walters,

I wanted to update you regarding our Department's findings related to questions raised during our meeting at the Governor's office on August 4. I apologize for the delay in getting back to you.

Lead and Copper Monitoring

Regarding Flint lead and copper compliance monitoring for the January – June 2015 period, the City has confirmed that all lead and copper samples collected throughout the City, whether routine sites or customer requests, were sent to the State of Michigan lab for analysis. Individual sample results are provided to the property owner within 30 days of receiving the lab results in accordance with the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 410(5)). Results from the State of Michigan lab are provided directly to our Office.

Staff have confirmed that the lead 90th percentile compliance calculation of 11 parts per billion is based on 69 samples that met the appropriate sampling location site criteria, and met the sample collection site and collection protocol requirements of the Safe Drinking Water Act for this monitoring period. A minimum of 60 samples were required for

this monitoring period. As indicated during the meeting, the City's sampling for lead complies with the Action Level standard of 15 parts per billion, but based on the population served by the City and these results, the City will need to make a recommendation to the MDEQ on how they will fully optimize their corrosion control treatment. These next steps continue to follow the requirements of the Lead and Copper Rule.

Samples collected at your residence of 212 Browning Avenue were not included this compliance determination as you utilize a whole home filter. As stated in the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 710a, Lead and Copper in tap water; monitoring requirements) "Sampling sites may not include faucets that have point of use or point of entry treatment devices designed to remove inorganic contaminants." Such treatment alters the water chemistry and water quality such that it is no longer representative of public water from the City's distribution system. Therefore, the City cannot use samples collected at your residence as part of its determination for public water system compliance with the lead or copper action level standard.

Sample Summary (samples taken at your residence)

For your information, we are providing the information that we've gathered regarding samples collected at your home. Our records indicate between February and June of this year there were six samples collected by either you or Mr. Mike Glasgow with the City of Flint, and submitted to the State Laboratory for analysis as follows:

February 11, Bathroom tap, collected at 10:20 AM by Mike Glasgow. This sample was analyzed for aesthetic metals (copper, iron, manganese, and zinc) which does not include lead analysis.

February 18, Kitchen tap, collected at 7:15 AM by you. This sample was analyzed for lead (104 parts per billion) and copper (non-detect).

February 25, Kitchen tap, collected at 10:26 AM by Mike Glasgow. This sample was analyzed for metals including lead. All results (including lead) were non-detect except for Barium 0.01 parts per million. The result for Barium was well below its maximum contaminant level of 2 parts per million.

March 3, Kitchen tap, collected at 6:00 AM by you. This sample was analyzed for lead (397 parts per billion) and copper (non-detect).

March 18, Kitchen tap, collected at 11:10 AM by Mike Glasgow. This sample was analyzed for lead (4 parts per billion) and copper (non-detect).

April 2, Pre-point of service, collected at 8:00 AM by you. This sample was analyzed for lead (707 parts per billion) and copper (110 parts per billion).

Lead Education/Outreach

As we discussed during the meeting, we support efforts to educate homeowners about the sources of lead in their private residence, provide guidance measures to reduce the potential for lead exposure, and provide information on resources for lead abatement. Along those lines, our Office has been in contact with the Department of Health and Human Services, Environmental Health Division, Healthy Homes Section and had some preliminary discussions about a public education and assistance campaign regarding household lead issues, guidance and abatement.

Lead monitoring by public water systems serves a dual purpose. The first purpose is to ensure the public water supply is adequately treating its water to address corrosion potential and help limit lead exposure. The second purpose is to inform homeowners about lead levels within their individual residence so that they can make educated choices regarding their own exposure risk.

~~You continue to express aesthetic water quality concerns at your home regarding color, taste, iron, etc. While we work with the City to continue addressing these concerns as they relate in part to the City's aging water distribution system infrastructure, we would expect homeowners to also take responsibility and due diligence to ensure proper construction and maintenance of their own household plumbing system. It has been indicated that your residence was recently re-plumbed using plastic piping materials. However, the City of Flint has no record of a plumbing permit being obtained for the completion of this work. While homeowners may choose to complete their own plumbing, it does not preclude the requirement to obtain a local permit for such construction work so that any plumbing work completed can be inspected for compliance with the requirements of the Michigan Plumbing Code and Michigan Residential Code. As a result it is uncertain whether there may be conditions within the household that are contributing to some of the water quality issues you are experiencing. (Steve – I'm proposing we delete this paragraph. I think it's a lightning rod and not sure it adds to the discussion. Are you okay with this?)~~

pH Results

During the meeting concerns were also expressed regarding pH levels within customer plumbing systems. As you may know, pH has no associated contaminant level as it is simply a numeric scale used to specify the acidity or alkalinity of a solution. The City of Flint conducts daily monitoring of pH values on both its raw and finished (treated) water at the City's water treatment plant as part of its operations. The City is also required to conduct water quality parameter monitoring out in the distribution system, which includes pH. Samples are analyzed in accordance with Standard Methods using properly calibrated analytical equipment. Results for pH from these samples is summarized below.

Since late April 2014 – June 2015, the following pH conditions were reported:

Water Treatment Plant – Finished Water plant tap pH range = 7.07 minimum to 9.9 maximum, overall average 7.7, measured daily. We believe the 9.9 is a one- time anomaly from softening treatment.

Distribution System – Water Quality Parameters taken from 25 sample sites located throughout and monitored quarterly

July – Sept. 2014: pH 7.71 average, range 7.56 – 7.86

Oct. – Dec. 2014: pH 7.88 average, range 7.62 – 8.10

Jan. – March 2015: pH 7.81 average, range 7.60 – 7.99

April – June 2015: pH 7.63 Average, range 7.48 – 7.80

In addition, the City's treated water contains alkalinity, which is a measurement of the buffering capacity of water to resist a change in pH. As you can see from the water quality parameter monitoring results above there has been very little change in pH within the City's distribution system. The pH levels described within customer site piping or premise plumbing systems are believed to be the result of onsite treatment and not representative of water quality shown to be occurring in the public water supply system.

Consumer Confidence Report

Finally, there was confusion during the meeting regarding the City's annual water quality report, the Consumer Confidence Report which we have since been able to clarify.

The City of Flint issued two separate Consumer Confidence Reports (CCR's) in 2015 covering the water quality data from 2014. One report was for the period of January – April 2014 when the City was obtaining water from Detroit (DWSD). And a second report was for the period April – December 2014 when the City was using the Flint River and its own Water Treatment Plant.

The CCR for DWSD water was mailed to customers in June. The Flint River based CCR was mailed to customers in mid-July, delayed due to issues with the printing contractor. We agree that having two separate reports caused confusion. We are working with the City to ensure both reports are posted to the City's website and both are made

available when requested by customers. Should the City choose to create separate CCR's during the year that the City of Flint connects to the Karegnondi Water Authority we will work with the City to provide more clarity and try to have all material included in a single mailing.

The DWSD based CCR is the one community members had at the meeting, while the DEQ brought a copy of the Flint River based CCR. As separate and distinct sampling was done under each source, this explains the discrepancy in the values and monitoring periods being reported in the respective CCR's.

We appreciate your interest in these matters and hope this has addressed many of the questions brought up during our meeting. I would like to provide this information to both Dr. Sullivan and Ms. Mayes, but I do not have their contact information. I'm hoping you can share this with them and any others that may be interested.

Sincerely,

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 9:44 AM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative, Not subject to FOIA: Information request for Draft report

George,

You should now have this information. If you need anything further, please let me know. Thanks.

Stephen Busch, P.E.
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 517-643-2314
buschs@michigan.gov

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 7:56 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ)
Subject: Preliminary and Deliberative, Not subject to FOIA: Information request for Draft report
Importance: High

I need some information rather quickly.

- 1) The first thing that I need is an explanation of why there were data points that were excluded from the Lead and Copper study for Flint. I also need to know the date(s) of the study(s) where data was excluded and what that data was. A copy of the report would be helpful. I believe I know the answer, I just need to formalize the answer.
- 2) I need a copy of Steve's memo indicating that "optimized" corrosion controls were in place. I understand the phrase "optimized" was an unfortunate word usage but apparently the memo contains that language and I need to be able to put that into context. If my understanding of the word choice in the memo is incorrect I still need a copy of the memo that is causing the buzz.

Please make these high priority items.

Thank you
 George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality

Desk ph (517) 284-6719
Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 10:55 AM
To: Krisztian, George (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

CI = Cast Iron
 DI = Ductile Iron
 Cu = Copper

You are correct that the size is the pipe diameter in inches. This information was provided by the City.

Stephen Busch, P.E.
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From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:54 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

Sorry, I forgot to answer the first question. You are correct, none of the Schools are on known lead service lines.

George L. Krisztian
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 Desk ph (517) 284-6719
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From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:52 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

Linda I believe the notation is the diameter of the service line and the material of construction. Cu would be copper.

Steve can you please let us know what the other materials are?

George

George L. Krisztian

Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
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From: Dykema, Linda D. (DHHS)
Sent: Tuesday, October 13, 2015 10:41 AM
To: Krisztian, George (DEQ); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

I concur with the prioritization.

So, none of the schools are on known lead service lines? What does the notation that follows (e.g., 4"CI) mean?

Linda D. Dykema, Ph.D.
Environmental Public Health Director
Division of Environmental Health
Michigan Department of Health & Human Services
517.335.8566
dykemal@michigan.gov

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:31 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: FW: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft
Importance: High

Linda, Shelly and Joe,

Please review and provide comment. The prioritization looks appropriate to me but I want to ensure we have consensus. Once I receive comments back we can finalize this as our priority list for the plumbing evaluation and subsequent sampling.

Thank you
George

George L. Krisztian
Flint Action Plan Coordinator
Laboratory Director
Michigan Department of Environmental Quality
Desk ph (517) 284-6719
Cell ph (517) 204-0381

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 9:41 AM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

Attached is the draft list prioritizing schools for plumbing assessment and lead sampling. At this point the City has not forwarded any additional requests for this type of analysis beyond the original request by the Flint Public Schools. As any additional requests are received this list will be updated.

Criteria for prioritization included,

- Zip Code
- Grades levels
- Lead Service Line Materials
- Screening Test results
- Plumbing Complexity

Please share this with Linda at DHHS for concurrence before providing to Joe Madziar, Plumbing Division, DLARA for implementation scheduling. Thanks.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
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517-643-2314
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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, October 14, 2015 11:36 AM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ)
Subject: RE: Preliminary and Deliberative not subject to FOIA: Information Request
Attachments: Final Notes from Michigan semi-annual call on 6/10; Final Notes from call Tuesday 8/31/15 with MI DEQ RE: Flint; FW: FOR REVIEW: MDEQ - Flint Call Notes

George,

Attached are emails with notes related to conference calls with EPA region V that I have and provide further discussion regarding Flint. Liane could still have additional material.

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: Krisztian, George (DEQ)
Sent: Wednesday, October 14, 2015 10:57 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ)
Subject: Preliminary and Deliberative not subject to FOIA: Information Request
Importance: High

Liane,

As a follow-up to our conversation yesterday, I need a copy of the write up that EPA provided to your group for the conference call that was held after Steve's e-mail of February 27, 2015.

Thank you!
 George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
 Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 10:57 AM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Edgerton, Shelly (LARA); Dykema, Linda D. (DHHS)
Subject: RE: Preliminary and Deliberative Not subject to FOIA Request for Draft Sampling protocol
Attachments: FW: Draft Deliberative Not Subject to FOIA

George,

I spoke with Liane. The draft protocol from last Friday 10/9 (see attached email) is the current version. It has been shared and commented on by DHHS, but those comments have not yet been incorporated.

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: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 8:34 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ); Edgerton, Shelly (LARA); Dykema, Linda D. (DHHS)
Subject: Preliminary and Deliberative Not subject to FOIA Request for Draft Sampling protocol
Importance: High

I realize that the sampling protocol is a work in progress and will be changing here very shortly. In order to get everyone on the same page can you please provide the latest version to me and the group indicated in the CC line of this e-mail. Please make sure to date the version so that we can keep things straight moving forward.

Thank you
 George

George L. Krisztian
 Flint Action Plan Coordinator
 Laboratory Director
 Michigan Department of Environmental Quality
 Desk ph (517) 284-6719
 Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 09, 2015 4:03 PM
To: Poy, Thomas; Dykema, Linda D. (DHHS); Madziar, Joseph (LARA)
Cc: Cook, Pat (DEQ); Sygo, Jim (DEQ); Tommasulo, Karen (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Subject: FW: Draft Deliberative Not Subject to FOIA
Attachments: Working Draft - Collecting Water Samples at Schools 10_9_15.docx

Attached is a working draft of a protocol for sampling schools, including information on the plumbing assessment.

Please provide comments by COB Monday. If you have questions, Pat will be around on Monday, but gone after that for a couple of days.

This is only a segment/portion of the larger document that will include further information, discussion regarding decision-making and strategies for short term and longer term actions.

From: Cook, Pat (DEQ)
Sent: Friday, October 09, 2015 3:49 PM
To: Shekter Smith, Liane (DEQ)
Subject: Draft Deliberative Not Subject to FOIA

Liane - please find attached a draft of the sampling procedures for schools.

If you need anything else, please let me know.

I'll see you on Monday.

pat

Patrick Cook, P.E.
 Community Drinking Water Unit
 Office of Drinking Water & Municipal Assistance
 Michigan Department of Environmental Quality
 Phone: (517) 284-6514
cookp@michigan.gov

DRAFT – WORK IN PROGRESS

Protocol for Collecting Water Samples at Schools for Lead Analysis

The following is a detailed, step-by-step procedure to ensure samples are collected in a systematic, consistent manner to provide meaningful results. By following the below procedures school and health officials will have information to be able to identify and correct any sources that contribute lead into drinking water. The recommended procedures are:

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

Step 1 – Prepare for On-Site Assessment

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

- When was the facility built?
- Have new buildings or additions been added? If so, when were they added? If built since 1986, were lead-free plumbing and solder used?
- When were the most recent plumbing repairs made and where were they located?
- What are the potable water pipes in your facility made of and what is their location? Options include: lead, brass, copper, plastic, galvanized metal and other materials. What materials were used to solder the potable water pipes in your system? Are brass taps, fittings or valves used? Note the locations.
- How many of the following outlets provide water for consumption: Bubblers, ice makers, water coolers and kitchen taps. Note their location. Include taps that might be used for making coffee or preparing formula.
- What brands and models of water coolers (cooled drinking fountains) provide water in your facility and what is their location?
- Do faucets have accessible screens and have they been cleaned?
- Can you detect any signs of corrosion, such as leaks, rust-colored water or stains?
- Is any electrical equipment grounded to water pipes?

- Are there any records of previous water testing?

Step 1 – Arrange for On-site Assessment with LARA Staff

LARA staff will contact school officials/staff and set a date and time for the assessment. A school representative familiar with the building layout and plumbing system needs to accompany LARA staff as they conduct the assessment. A room reserved for records review should also be available.

Step 3 – Prioritize Sample Sites and Sampling Sequence

It is recommended that all faucets, taps and outlets that are used regularly by students and staff for drinking, cooking, making coffee or food preparation will be sampled. High priority sites would include:

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

LARA staff will assign a sample site Identification (ID) number for each sample site and the order in which each site is to be sampled. This number will reflect the type of tap/outlet and location. Sites closest to the service line are to be collected first, then in a sequence as they get farther from the service line until the site the farthest away is sampled last. This will minimize the chance that the piping is not flushed by a downstream or other sample location prior to collecting the samples at that site.

Step 4 – Collect the Samples

After the sites and order of collection have been determined by LARA staff, the samples can be collected by school staff. While not a requirement, it is highly recommended that the samples be collected by someone with experience in water sample collection. In addition, make sure to inform all other staff including teachers, maintenance staff, parents and students of the sampling plans.

1. Three samples will be collected from each designated sample site. Therefore, obtain three, 125 milliliter (ml) sample containers for each sample site from the DEQ laboratory.
2. Collect all water samples before the building opens and before any water is used. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is collected.
3. Do not collect samples in the morning after a vacation, weekend or holiday. These results will likely be higher because of the extended contact time with the water
4. The three samples from each site are to be collected at first draw, after a 30 second flush, and a 2 minute flush as follows:
 - a. After the appropriate 8 - 18 stagnation time, place the first bottle under the tap, open the tap to produce a slow, steady "pencil thin" flow and fill the bottle to the appropriate level.
 - b. 30 seconds after filling the first bottle, fill the second bottle.
 - c. 2 minutes after filling the second bottle, fill the third bottle.

5. Make sure to not turn the faucet off or adjust the flow between samples.
6. Make sure to mark the bottles as "first draw", "30 sec flush" or "2 min flush" and also indicate this information on the sample submission form.
7. Assign an appropriate sample Identification (ID) number to each sample collected. Record this number (including the flush time) on the sample container and submission form.
8. Collect the remainder of the samples from all designated sites in the pre-determined order as recommended by LARA.
9. Deliver or ship the samples to the lab as instructed.

Step 5 - Laboratory performs analysis and informs DEQ – ODWMA staff of the results

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Saturday, October 10, 2015 8:33 AM
To: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Dayne Walling; donna. cole; Dykema, Linda D. (DHHS); edwardsm; Krisztian, George (DEQ); Gerald (Jed) Natzke; Howard Croft; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Michael Wright; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; schock.michael@epa.gov; Sean Kammer; Busch, Stephen (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane
Subject: 3rd Quarter Water Report
Attachments: 3rd Quarter Water Quality Report.docx

Team,

Included in this email is a copy of the first quarter water quality report that has been developed by the Utilities Division. Please take a look and offer any comments that you may have regarding content. There will be an additional one page insert containing three months test data inserted prior to distribution.

The purpose of the quarterly mailer is to increase communication, provide more transparency, and put more information into the hands of the public about what's occurring within the water system and with the infrastructure.

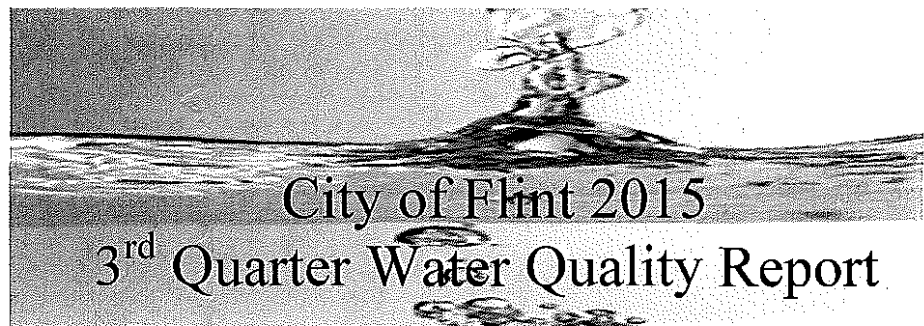
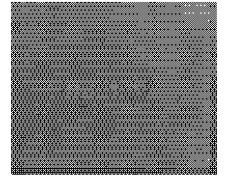
I will be putting together a separate weekly report for this Committee.

Thank you,

--

Howard Croft
 Public Works Director
 City of Flint
 1101 S. Saginaw Street
 Flint, MI 48502
 PH# 810.766.7135 Ext.2043
hcroft@cityofflint.com

Customer Service Center
City Hall
1101 S. Saginaw St.
Flint, MI 48501



The Quarterly Water Quality Report provides important information about your drinking water. This report includes information about the source of the water, health information, charts that summarize regulatory required testing results, and a table giving explanations of important terms to understand when viewing the test results. The City of Flint Department of Utilities is dedicated to providing quality drinking water to the residents of the community. The Flint Water Plant operates and maintains a certified drinking water laboratory to assure compliance with all state and federal regulations, and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water. Information about your drinking water is available on the City of Flint web page at www.cityofflint.com or by calling the City of Flint Water Plant at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can also be found on the U.S. Environmental Protection Agency (EPA) web site at www.epa.gov/safewater/.

Water Source

The City of Flint began using the Flint River as a water source in May of 2014. Flint is located roughly in the middle of the Flint River Watershed which includes Holloway Reservoir, C.S. Mott Lake, Kearsley Lake, and numerous streams and creeks that drain to these lakes or directly into the Flint River.

After 16 months of treating water from the Flint River, the City became aware that the while **still meeting all Safe Drinking Water Standards**, the level of corrosiveness could result in more lead leaching from service lines and household plumbing. Reports of elevated blood lead levels resulted in the City's Technical Advisory Committee making a recommendation to return to the previous source of water while waiting for the KWA to provide water from Lake Huron.

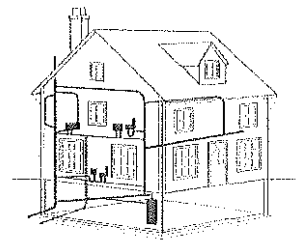
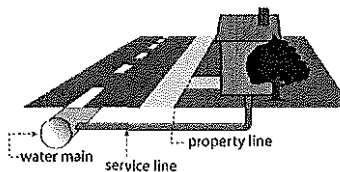
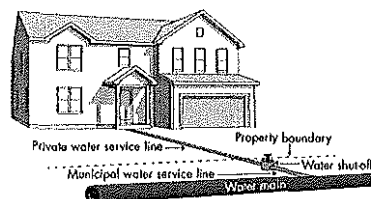
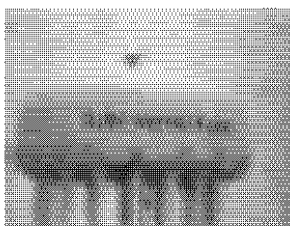
On Wednesday October 8, 2015, with the consent of Governor Snyder, the City stated they plan to return to its previous source of water. The decision followed two consecutive lead and copper test periods that exceeded 5ug/L which calls for additional action. In August of 2015 following the guidance of the DEQ, the City began also developing additional corrosion control measures that will be evaluated if it is needed as an additive to treated water but will be required when the city begins treating raw water from the Karegnondi Water Authority.

The City contributed \$2 Million dollars, the Mott Foundation contributed \$4 Million dollars, and the State of Michigan contributed \$ 6 Million dollars to make the transition possible. The City expects the transition to occur in October.

The City of Flint signed a contract with the Karegnondi Water Authority (KWA) in 2013. The KWA consists of a group of local communities that decided to support and fund construction of a raw water pipeline to Lake Huron. The KWA will provide the City of Flint Water Treatment Plant with source water from Lake Huron. The KWA pipeline is currently under construction, and is scheduled to be completed before the end of 2016. If you would like to know more information, contact the City of Flint Water Plant.

Current Drinking Water Issues

As noted, there has been a heightened awareness of lead leaching into drinking water through service lines and household plumbing. The City's Technical Advisory Committee has enlisted the support of EPA lead experts and is working with State of Michigan representatives to increase testing, rebuild public confidence, and implement long-term solutions to lead. It is recommended that everyone get their water tested and check with a plumber to evaluate the type and condition of your household plumbing. The City is currently mapping all of its lead service lines and working to develop a program to get lines changed over time.



NO LEAD IN THE
WATER LEAVING
THE TREATMENT
PLANT

LITTLE OR NO LEAD
IN THE WATER IN
TRANSMISSION
MAINS

LEAD CAN LEACH
INTO WATER
THROUGH WATER
SERVICE LINES

LEAD CAN LEACH
INTO WATER
THROUGH
HOUSEHOLD
PLUMBING

Water Filters

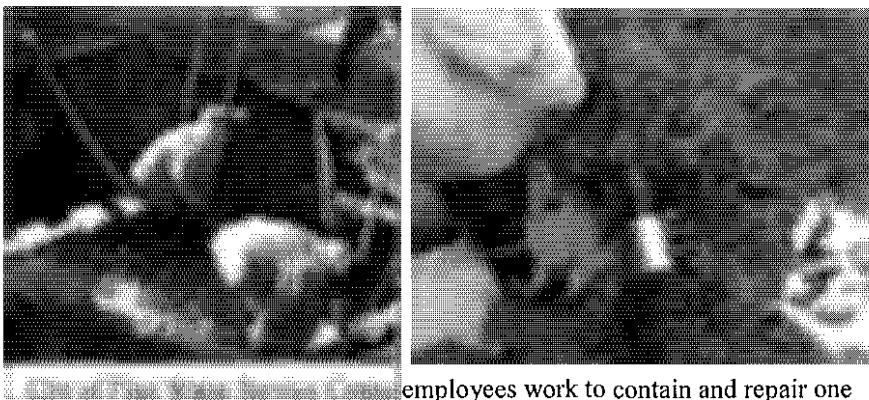
Free water filters have been made available to current Flint residents at several locations. The MDHHS and the Genesee County Community Action Resource Department (GCCARD) are providing Free National Sanitation Foundation certified water filters at the following locations.

Residents receiving MDHHS assistance are encouraged to visit either the **125 E. Union St.** or **4809 Clio Rd.** MDHHS office location to obtain a free, certified home water filter. Residents who are not currently enrolled in MDHHS assistance programs should visit the (GCCARD) offices located at **2727 Lippincott** and **601 N. Saginaw** in Flint.

Staff will be onsite at all four locations from **9 a.m. to 4 p.m., Monday through Friday**, to distribute filters and assist residents who have questions about proper installation.

3rd Quarter Work Accomplished

- Successfully completed the installation of Granulated Activated Carbon at the water treatment plant which reduced the TTHM level in the water and helped bring the City back into compliance with the Safe Drinking Water Act.
- Over 3000 new water meters were installed creating better accuracy, accountability, and decreasing the number of estimated reads on water & sewer bills.
- Evaluated over 8000 valves in the system and identified over 2300 that are currently inoperable. The repair of these valves will be budgeted and worked into our multi-year Capital Improvement Plan.
- Leak Detection on all 600 miles of the distribution system has started and is over halfway complete. Several dozen leaks have been identified and repairs continue as more leaks are found. This has decreased the amount of water loss existing in the system.
- Construction of a load out facility at our wastewater plant is on target for completion by November and will allow the City to eliminate the use of the incinerator resulting in significant annual savings.
- Hundreds of main breaks are repaired annually by City workers on top of construction projects and routine maintenance.



employees work to contain and repair one of many main breaks that continues to occur as a part of an antiquated infrastructure system.

Hundreds of water main breaks occur annually and the City's skilled workforce is constantly faced with long hours and changing weather conditions in which they work. Hydrant flushing and hydrant winterization are also part of the system maintenance and often cause water discoloration. It is advised that you run your water for several minutes to allow discoloration to

pass if work is being done in your area. The City is working to increase notification to residents when and where work is occurring.

General Information

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's **Safe Drinking Water Hotline (800) 426-4791**.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ♦ **Microbial contaminants**; such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ♦ **Inorganic contaminants**; such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ♦ **Pesticides and herbicides**; which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ♦ **Organic chemical contaminants**; including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ♦ **Radioactive contaminants**; which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the hotline above.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that the lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint Department of Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If you are concerned about elevated lead levels in your home's water, you can minimize your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, June 25, 2015 10:48 AM
To: Mike Glasgow; 'bwright@cityofflint.com'
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: 6/30 & 7/1/15 deadlines
Attachments: Flint-2015-04-03-LT2ESWTR.pdf

Morning Mike & Brent, just wanted to remind you/confirm that Flint is on track for a few items.

1 – We hope you have 61 more lead/copper samples collected and sent to the lab by 6/30/15, and that they will be below the AL for lead. As of now with 39 results, Flint's 90th percentile is over the AL for lead.

2 – LT2 source water monitoring plan, reminder that it is due to our office for review by 7/1/15 per Mike's 4/3/15 letter, (attached).

3 – Consumer Confidence Report, (CCR), has not been received yet – due to our office, Gen. Co. LHD & your customers by 7/1/15.

Please provide an update for the above items.

thanks,

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 3, 2015

Mr. Brent Wright
City of Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

Dear: Mr. Wright

SUBJECT: Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule)
2nd Round of Source Water Monitoring Requirements

The LT2 Rule was promulgated by the United States Environmental Protection Agency on January 5, 2006. The Department of Environmental Quality (DEQ) adopted this rule into the Administrative Rules in December, 2009. All public water systems that are supplied by a surface water source, and systems supplied by a ground water source under the direct influence of surface water (GWUDI), are subject to this rule.

According to the LT2 Rule, systems are required to conduct an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI source. Please keep in mind that grandfathering data will not be accepted for the second round of monitoring. This monitoring includes at least one source water *Cryptosporidium*, *E. coli*, and turbidity sample per month for a period of 24 months for systems serving populations greater than 10,000 people. Systems will be assigned to a "treatment bin" based on the results of source water monitoring. The treatment bin specifies the level of *Cryptosporidium* removal and/or inactivation that the system must achieve.

Our records indicate that your system is required to comply with the source water monitoring requirements on Schedule 2 as stated below in Table 1. Therefore, your system is required to submit to the DEQ, a source water monitoring plan for each plant by July 1, 2015, and start the 2nd round of monitoring in October, 2015.

Table 1 – LT2 Milestone Dates for 2nd Round of Source Water Sampling

System Population	Schedule	Must submit Source Water Sampling Plan by...	Must begin second round of source water monitoring...
At least 100,000	1	January 1, 2015	April 1, 2015
50,000 – 99,999	2	July 1, 2015	October 1, 2015
10,000 – 49,999	3	July 1, 2016	October 1, 2016
<10,000	4	July 1, 2017	October 1, 2017

Mr. Brent Wright

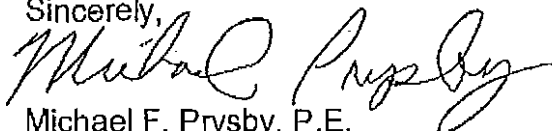
2

April 3, 2015

Enclosed with this letter is a Source Water Sampling Plan template that you can complete and submit to this office to comply with the July 1, 2015, deadline. The template includes instructions and a worksheet that will assist the DEQ in determining if your plan meets the requirements of the LT2 Rule.

If you have any questions about this subject, feel free to contact me at 517-290-8817; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 1st Floor South, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,



Michael F. Prysby, P.E.

District Engineer

Field Operations Section

Office of Drinking Water and
Municipal Assistance

Enclosures

cc: Mr. Howard Kroft, City of Flint

Rennaker, Joanne (DEQ)

From: Henry, James <jhenry@gchd.us>
Sent: Wednesday, October 14, 2015 12:55 PM
To: Howard Croft; Reynolds, Lawrence
Cc: Lane, Mike; Lytle, Darren; Andy Leavitt; Marc Edwards; Amy Hovey; Brent Wright; Dayne Walling; donna. cole; Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Gerald (Jed) Natzke; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Wright, Michael; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Schock, Michael; Sean Kammer; Busch, Stephen (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane; Valacak, Mark
Subject: RE: 3rd Quarter Water Report
Attachments: CDC - Lead - Tips - Sources of Lead - Water.website; EPA Is there lead in my drinking water.pdf; MDH Let it Run.pdf; WI DNR Lead in Drinking Water.pdf; Lead Brochure.pdf

Hello everyone,

Similar to many of your organizations the Genesee County Health Department has been receiving many specific questions regarding risks from lead. We have partnered with MDEQ's Toxicology Division to try to get some answers. Our research has provided only limited information. Attached are EPA, CDC and a few other documents that have been extremely helpful, but they do not address many of the specific questions. Also, copied below is a CDC response to some of the questions.

Please feel free to comment and add to the list below. If anyone has official, scientific or generally accepted guidance, please share it. I'll compile a comprehensive FAQ document and share it back with the group.

Public FAQ's

- Is it ok to wash fruits and vegetables?
- Is it ok to wash dishes?
- Is it ok to wash hands and then handle or eat food?
- Is it ok to wash clothes? (skin irritations)
- What are risks to pets (any particular pet that may be more susceptible) i.e. canary?

Hamilton Health Center Questions w/ CDC response below:

1. Can Flint River water be used to wipe down surfaces, counter tops?
2. Is it ok to utilize the water for cleaning of instruments?
3. Is it ok to use the water in autoclaving?

Dr. Arias wrote: We know of no formal guidance on this issue. However, lead in water is measured in parts per billion. Ambient contamination of surfaces and metals in general is much higher. Lead is also not well absorbed through skin. Our SMEs would not expect any problems with this practice unless the water is ingested. I'm copying Mary Jean Brown here who would be available if you have additional questions or need some other follow up.

Thanks Jim

Jim Henry RS, MBA
 Environmental Health Supervisor
 Genesee County Health Department www.gchd.us
 630 S. Saginaw St., Suite 4

Flint, MI 48502-1540
 Phone (810) 257-3618 Fax (810) 257-3125
 E-mail jhenry@gchd.us



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For a copy of the Health Department's Notice of Information Practices, contact the Health Department or visit the Health Department's website at <http://www.gchd.us/>

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

Sent: Tuesday, October 13, 2015 5:59 PM

To: Reynolds, Lawrence

Cc: Lane, Mike; Lytle, Darren; Andy Leavitt; Marc Edwards; Amy Hovey; Brent Wright; Dayne Walling; donna. cole; dykemal; George Krisztian (DEQ); Gerald (Jed) Natzke; Henry, James; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Wright, Michael; Mike Prysby (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Schock, Michael; Sean Kammer; Stephen Busch (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane; Valacak, Mark

Subject: Re: 3rd Quarter Water Report

All,

The comments continue to be helpful and I am making adjustments as we go. I spent two hours at the Health Department today at their board meeting and we have greatly enhanced the communication between the City and the GCHD. I will be attending their future board meetings and will keep Mark and Jim not just appraised but involved in directional decisions as we continue to craft short and long term plans.

On Tue, Oct 13, 2015 at 10:39 AM, Reynolds, Lawrence <LawrenceR@mottchc.org> wrote:

Thank you Mr. Lane. These points will help medical providers stay on message with information our families can act on .

From: Lane, Mike [<mailto:mjlane@umflint.edu>]

Sent: Tuesday, October 13, 2015 9:53 AM

To: 'Lytle, Darren'; Howard Croft; Andy Leavitt

Cc: Marc Edwards; Amy Hovey; Brent Wright; Dayne Walling; donna. cole; dykemal; George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Reynolds, Lawrence; Reynolds, Lawrence; Michael Glasgow; Wright, Michael; Mike Prysby (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson;

Samir Matta; Schock, Michael; Sean Kammer; Stephen Busch (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane

Subject: RE: 3rd Quarter Water Report

Howard,

I agree with Darren that it may be a good idea to let the community know and prepare them that while switching back to Detroit water in the near future they will likely see discolored water, particulates, etc. during the transition.

Also, providing specific details on how to sample water in their homes would be helpful... the first draw, how long to flush before taking the second sample, how long water should sit in pipes before the first draw, etc.

It would further help to rebuild trust with the community to share the City's plan/timeline of more aggressive water quality sampling, specifically as it relates to lead exposure in homes and schools. Is there a timeline that can be shared which the City is working with to identify homes with lead service lines, and how can the City and State work together to assist those homeowners with mitigation. Perhaps indicating that the issue of lead is and will remain a high priority for the City until all households, schools, etc. have reliable/safe water quality regardless of whether the source of lead is from city transmission lines or a property owner's service line and home fixtures would also be helpful.

Mike

** ** *

Michael Lane

Director, Environment, Health and Safety

The University of Michigan-Flint

810-766-6763

810-919-1709 cell

mjlane@umflint.edu

From: Lytle, Darren [<mailto:Lytle.Darren@epa.gov>]

Sent: Tuesday, October 13, 2015 7:40 AM

To: Howard Croft; Andy Leavitt

Cc: Marc Edwards; Amy Hovey; Brent Wright; Dayne Walling; donna. cole; dykemal; George Krisztian (DEQ); Gerald (Jed) Natzke; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Wright, Michael; Lane, Mike; Mike Prysby (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Schock, Michael; Sean Kammer; Stephen Busch (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane

Subject: RE: 3rd Quarter Water Report

Howard,

I am in agreement with past comments and suggestions. Is this the time to let the public know your future plans? Are you expecting to be back to Detroit water next quarter? If so, that does not necessarily come without issues. It is a change and the potential for a brief upset (e.g., "red" water, particles, etc) exists. Would it be worth letting the public know in advance? Under "current drinking water issues", do you want to let residents know how and where to take samples here? A sampling plan (beyond LCR compliance sampling) is very important to understand the relative lead source (brass, solder and service lines) contributions, assess the current situation and the effectiveness of the return to Detroit water to reduce lead. You could state that on is being developed.

Darren

Darren A. Lytle, Ph.D., P.E.

Branch Chief (Acting)

U.S. Environmental Protection Agency

26 West Martin Luther King Dr.

Cincinnati, Ohio 45268

Phone: (513) 569-7432

Fax: (513) 487-2543

email: lytle.darren@epa.gov

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

Sent: Sunday, October 11, 2015 7:29 AM

To: Andy Leavitt

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

Subject: Re: 3rd Quarter Water Report

All,

The comments were very helpful and I have made several revisions to the report that was sent yesterday, please review the amendments and forward any additional recommendations. I would like to solicit comments from anyone in the medical community that is willing to be quoted.

On Sat, Oct 10, 2015 at 12:03 PM, Andy Leavitt <aleavitt@senatedems.org> wrote:

I would echo Marc's sentiment on the bold language agreeing with his points but I would also add that trust needs to be rebuilt and the public simply will not believe anything in the document if you start by telling them it still meets standards. They do not differentiate between regs and rules but they know the water does not meet the standard of the physician community.

I would also recommend opening with timeline of going back to Detroit and what steps people can take to mitigate lead issues. Preferably with an excerpt from a physician.

The technical information matters for transparency but the trust gap is so wide that most people will be skeptical of all of it.

On Sat, Oct 10, 2015 at 11:48 AM Marc Edwards <edwardsm@vt.edu> wrote:

Hi Howard,

I think it is universally acknowledged now, that 30 seconds to 2 minutes flushing are not adequate, and **all public education should say 5 minutes flushing.**

I also think that given results of our team sampling 277 homes, the high levels of lead MDEQ detected in the Flint schools (a 90%ile over 15 ppb..which is horrible because they are not tier 1 plumbing sites), and the problems in the

official LCR sampling conducted in late 2014-2015, that the following statement (in bold) is not really helpful in getting the message out about the current health risks. The bold statement seems more like wishful thinking or a legal position, and detracts from the goal of telling the public about the known problems.

*After 16 months of treating water from the Flint River, the City became aware that the while **still meeting all Safe Drinking Water Standards**, the level of corrosiveness could result in more lead leaching from service lines and household plumbing.*

That is my input. I am available at 540 231-7236 or 540 320-8740, if anyone should have questions about this.

Best Regards,

Marc Edwards

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

Sent: Saturday, October 10, 2015 8:33 AM

To: Amy Hovey; Andy Leavitt; Brent Wright; Darren Lytle; Dayne Walling; donna. cole; dykema; edwardsm; George Krisztian (DEQ); Gerald (Jed) Natzke; Howard Croft; James Henry; Jamie Gaskin; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Lawrence Reynolds; Lawrence Reynolds; Michael Glasgow; Michael Wright; Mike Lane; Mike Prysby (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; schock.michael@epa.gov; Sean Kammer; Stephen Busch (DEQ); Warren Green; Wurfel, Brad (DEQ); Anthony Chubb; Kevin Keane

Subject: 3rd Quarter Water Report

Team,

Included in this email is a copy of the first quarter water quality report that has been developed by the Utilities Division. Please take a look and offer any comments that you may have regarding content. There will be an additional one page insert containing three months test data inserted prior to distribution.

The purpose of the quarterly mailer is to increase communication, provide more transparency, and put more information into the hands of the public about what's occurring within the water system and with the infrastructure.

I will be putting together a separate weekly report for this Committee.

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

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Howard Croft

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--

Howard Croft

Public Works Director

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hcroft@cityofflint.com



Water

How does lead get into my tap water?

Measures taken during the last two decades have greatly reduced exposures to lead in tap water. These measures include actions taken under the requirements of the 1986 and 1996 amendments to the Safe Drinking Water Act (<http://www.epa.gov/safewater/sdwa/index.html>) and the U.S. Environmental Protection Agency's (EPA's) Lead and Copper Rule (<http://www.epa.gov/safewater/lcrmr/index.html>).

Even so, lead still can be found in some metal water taps, interior water pipes, or pipes connecting a house to the main water pipe in the street. Lead found in tap water usually comes from the corrosion of older fixtures or from the solder that connects pipes. When water sits in leaded pipes for several hours, lead can leach into the water supply.

How do I know if my tap water is contaminated with lead?

The only way to know whether your tap water contains lead is to have it tested. You cannot see, taste, or smell lead in drinking water. Therefore, you must ask your water provider whether your water has lead in it. For homes served by public water systems, data on lead in tap water may be available on the Internet from your local water authority. If your water provider does not post this information, you should call and find out.

Does a high lead level in my tap water cause health effects?

High levels of lead in tap water can cause health effects if the lead in the water enters the bloodstream and causes an elevated blood lead level.

Most studies show that exposure to lead-contaminated water alone would not be likely to elevate blood lead levels in most adults, even exposure to water with a lead content close to the EPA action level for lead of 15 parts per billion (ppb). Risk will vary, however, depending on the individual, the circumstances, and the amount of water consumed. For example, infants who drink formula prepared with lead-contaminated water may be at a higher risk because of the large volume of water they consume relative to their body size.

What can I do to reduce or eliminate lead in my tap water?

If your tap water contains lead at levels exceeding EPA's action level of 15 ppb, you should take action to minimize your exposure to the lead in the water.

You should begin by asking your water authority these questions:

1. Does my water have lead in it above EPA's action level of 15 parts per billion (ppb)?

If the answer is no, no action is needed.

If the answer is yes, also ask the next question:

2. Does the service pipe at the street (header pipe) have lead in it?

This information is very important. It determines which of the next two actions (A or B) you should follow to protect your household's health.

A) If the pipe in the street (header pipe) **DOES NOT** have lead, the lead in your tap water may be coming from fixtures, pipes, or elsewhere inside your home.

Until you eliminate the source, you should take the following steps any time you wish to use tap water for drinking or cooking, especially when the water has been off and sitting in the pipes for **more than 6 hours**:

a. Before using any tap water for drinking or cooking, flush your water system by running the kitchen tap (or any other tap you take drinking or cooking water from) on **COLD** for **1–2 minutes**;

b. Then, fill a clean container(s) with water from this tap. This water will be suitable for drinking, cooking, preparation of baby formula, or other consumption. To conserve water, collect multiple containers of water at once (after you have fully flushed the water from the tap as described).

B) If the pipe at the street (header pipe) **DOES** contain lead, lead in the tap water may be coming from that pipe or connected pipes (it may also be coming from sources inside your home).

Until the lead source is eliminated, you should take the following steps any time you wish to use tap water for drinking or cooking, especially when the water has been off and sitting in the pipes for **more than 6 hours**. Please note that **additional flushing is necessary**:

a. Before using any tap water for drinking or cooking, run high-volume taps (such as your shower) on **COLD** for 5 minutes or more;

b. Then, run the kitchen tap on **COLD** for **1–2 additional minutes**;

c. Fill a clean container(s) with water from this tap. This water will be suitable for drinking, cooking, preparation of baby formula, or other consumption. To conserve water, collect multiple containers of water at once (after you have fully flushed the water from the tap as described).

3. In all situations, drink or cook only with water that comes out of the tap cold. Water that comes out of the tap warm or hot can contain much higher levels of lead. Boiling this water will **NOT** reduce the amount of lead in your water.

4. You can also reduce or eliminate your exposure to lead in drinking water by consuming only bottled water or water from a filtration system that has been certified by an independent testing organization to reduce or eliminate lead. See [resources](#) below.

5. Children and pregnant women are especially vulnerable to the effects of lead exposure. Therefore, for homes with children or pregnant women and with water lead levels exceeding EPA's action level of 15 ppb, CDC recommends using bottled water or water from a filtration system that has been certified by an independent testing organization to reduce or eliminate lead for cooking, drinking, and baby formula preparation. Because most bottled water does not contain fluoride, a fluoride supplement may be necessary.

Also, some bottled waters have not been tested and may not be appropriate for consumption. Contact independent testing organizations that certify bottled water. See [resources](#) below.

6. Make sure that repairs to copper pipes do not use lead solder.

Advice for lead safe water practices after plumbing work in housing with lead water lines or lead solder.

These practices include

1. Testing water after plumbing work in older housing. Please contact your [state lead program](#) (<http://www.cdc.gov/HealthyHomes/programs.html>) for information about water testing in your area.
2. Inspecting the aerator on the end of the faucet and removing any debris such as metal particles.
3. Flushing water lines before using the water for drinking or cooking.

If you own your home, you may also consider full replacement of lead water lines by removing the private lines running from the water meter into your home. This precaution has not been adequately studied, however, because the data available to CDC included too few homes having had full replacement of lead water lines. Contact your water authority for information about replacing water service lines.

If my water has high lead levels, is it safe to take a bath or shower?

Yes. Bathing and showering should be safe for you and your children, even if the water contains lead over EPA's action level. Human skin does not absorb lead in water.

This information applies to most situations and to a large majority of the population, but individual circumstances may vary. Some situations, such as cases involving highly corrosive water, may require additional recommendations or more stringent actions. Your local water authority is always your first source for testing and identifying lead contamination in your tap water. Many public water authorities have websites that include data on drinking water quality, including results of lead testing. Links to such data can be found on the EPA website:

<http://www.epa.gov/safewater/dwinfo.htm> (<http://www.epa.gov/safewater/dwinfo.htm>).

Resources

Please visit the following sites for more information:

General:

Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water---District of Columbia, 2004. *MMWR*. April 2, 2004; 53(12):268-270.

Addendum: After release of the *MMWR* article titled "Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water -- District of Columbia, 2004," some reports have suggested erroneously that CDC determined that lead in residential tap water at concentrations as high as 300 parts per billion is 'safe.' CDC reiterates the key message from the 2004 article: because no safe blood level has been identified for young children, all sources of lead exposure for children should be controlled or eliminated. Lead concentrations in drinking water should be below the EPA action level of 15 parts per billion.

EPA Ground Water & Drinking Water (<http://www.epa.gov/safewater/lead/index.html>)

This site includes comprehensive information on lead in drinking water. Safe Drinking Water Hotline: 1-800-426-4791.

Water Fluoridation:

CDC Oral Health Resources

This site includes water fluoridation fact sheets, frequently asked questions, and publications.

Bottled Water and Water Filters:

NSF International (<http://www.nsf.org/>)

A nonprofit organization that certifies bottled water

(http://www.nsf.org/consumer/bottled_water/index.asp?program=BottledWat) and water filters

(http://www.nsf.org/consumer/drinking_water/dw_treatment.asp?program=WaterTre).

Consumer Affairs Office toll-free hotline: 1-800-673-8010.

International Bottled Water Association (<http://www.bottledwater.org>)

The trade association that represents the bottled water industry.

Information Hotline: 1-800-WATER-11.

- Links to non-federal organizations are provided solely as a service to our users. These links do not constitute an endorsement of these organizations or their programs by CDC or the federal government, and none should be inferred. CDC is not responsible for the content of the individual organization Web pages found at these links.

Page last reviewed: June 15, 2013

Page last updated: October 15, 2013

Content source: National Center for Environmental Health (/nceh), Division of Emergency and Environmental Health Services (/nceh/eehs/default.htm)

WHAT IS LEAD?

- Lead is a toxic metal that is harmful if inhaled or swallowed.
- Lead can be found in air, soil, dust, food, and water.

HOW CAN I BE EXPOSED TO LEAD?

- The greatest exposure to lead is swallowing or breathing in lead paint chips and dust.
- Lead also can be found in some household plumbing materials and water service lines.

WHO IS AT RISK?

- Children ages 6 and under are at the greatest risk. Pregnant women and nursing mothers should avoid exposure to lead to protect their children.
 - Exposure to lead can result in delays in physical and mental development.
- Your child is also at risk if:

- your home or a home that your child spends a lot of time in was built before lead paint was banned in 1978.
- renovation work is being done in such a home.
- the adults in the home work with lead.

HOTLINES & INFORMATION

EPA Safe Drinking Water Hotline:
800-426-4791

National Lead Information Center:
800-424-LEAD
www.epa.gov/lead

NSF International:
www.nsf.org

Lead in Drinking Water Web Site:
www.epa.gov/safewater/lead

Additional Information:

Read the annual report you get from your water utility to find out about how they are working to reduce levels of lead in drinking water and other information about your drinking water. Call them if you have any questions.

Contact your local public health department or talk to your doctor about reducing your family's exposure to lead.



IS THERE LEAD IN MY DRINKING WATER?

You can reduce the risk
of lead exposure
from drinking water
in your home.



**Tips For
Protecting
Your Family's
Health**

Office of Water (4606 M)
EPA 816-F-05-001
February 2005

Printed on Recycled Paper

HOW DOES LEAD GET INTO WATER?

Lead enters the water ("leaches") through contact with the plumbing.

Lead leaches into water through:

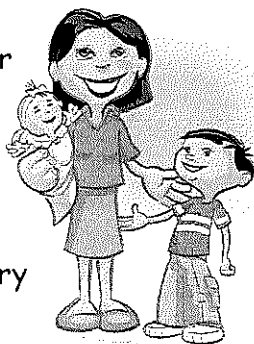
- Corrosion* of
 - Pipes
 - Solder
 - Fixtures and Faucets (brass)
 - Fittings

*Corrosion is a dissolving or wearing away of metal caused by a chemical reaction between water and your plumbing.

The amount of lead in your water also depends on the types and amounts of minerals in the water, how long the water stays in the pipes, the amount of wear in the pipes, the water's acidity and its temperature.

HEALTH TIP

To help block the storage of lead in your child's body, serve your family meals that are low in fat and high in calcium and iron, including dairy products and green vegetables.



What should I do if I suspect that my water contains high lead levels?

- If you want to know if your home's drinking water contains unsafe levels of lead, have your water tested.
- Testing is the only way to confirm if lead is present or absent.
- Most water systems test for lead as a regular part of water monitoring. These tests give a system-wide picture and do not reflect conditions at a specific drinking water outlet.
- For more information on testing your water, call EPA's Safe Drinking Water Hotline at 800-426-4791.

Should I test my children for exposure to lead?

- Children at risk of exposure to lead should be tested.
- Your doctor or local health center can perform a simple blood test to determine your child's blood-lead level.
- If your child has a blood lead level at or above 10ug/dl, should take preventive measures.

QUICK TIPS TO REDUCE YOUR FAMILY'S EXPOSURE TO LEAD



Boiling your water will not get rid of lead.

- Use cold water for drinking or cooking. Never cook or mix infant formula using hot water from the tap.
- Make it a practice to **run the water at each tap** before use.
- Do not consume water that has sat in your home's plumbing for more than six hours. First, make sure to **run the water** until you feel the temperature change before cooking, drinking, or brushing your teeth, unless otherwise instructed by your utility.
- Some faucet and pitcher filters can remove lead from drinking water. If you use a filter, be sure you get one that is certified to remove lead by the NSF International.

Let it run. . . and get the lead out!

Important information on how to protect your health

Lead is a common metal that has been in many consumer products but is now known to be harmful to human health if ingested or inhaled. It can be found in lead-based paint, air, soil, household dust, food, some types of pottery, and drinking water. When people come in contact with lead, it may enter their bodies and accumulate over time, resulting in damage to the brain, nervous system, red blood cells, and kidneys.

The following is information about lead in drinking water: why it is a cause for concern, how it enters water, and most importantly, simple precautions you can take to protect you and your family.

Why is lead in drinking water a problem?

Drinking water is not our only source of lead exposure. However, combined with other sources, lead in water can increase the build-up of lead in our bodies. Lead in water can be a special problem for infants, whose diets may be mostly liquids, such as baby formulas or concentrated juices mixed with water. Smaller bodies can absorb lead more rapidly than bigger ones, so amounts of lead that won't hurt an adult can be very harmful to a child. A child's mental and physical growth can be permanently harmed by too much lead.

How does lead get into my drinking water?

Lead is rarely found in natural sources of water such as rivers and lakes or underground aquifers. However, it may work its way into drinking water after the water has left the treatment plant and is on its way to people's faucets. This usually happens through the corrosion of materials containing lead in household plumbing. These materials include brass faucets, lead solder on copper pipes, lead pipes, or lead service lines connecting the water main to the inside plumbing.

Lead pipes are no longer installed for service lines or in household plumbing, and lead solder has been outlawed in Minnesota since 1985. The amount of lead allowed in brass faucets has also been limited, but can still contribute some lead to drinking water (note that many faucets are made of brass even if they do not have a "brass" color). Even with these restrictions in place, some homes—especially older homes—may still have significant amounts of lead in their plumbing systems.

How can I reduce lead in my drinking water?

Let It Run. Flush taps before using water from them for drinking or cooking. Water that stands idle in pipes for long periods of time—such as overnight or during the day when people are gone to work and school—is more likely to absorb materials from the plumbing system. The best way to rid the pipes of water that may contain lead is to let the cold-water faucet run until you feel that the water is as cold as it will get. The amount of time this takes will depend on your home and how its plumbing is arranged—but you should always run the water for at least 60 seconds. If your home has a lead service line (which you can determine by asking your local water utility), you should flush water for an additional 2 to 3 minutes to make sure you are getting fresh water from the water main. Be sure to flush standing water before using any water for drinking or cooking purposes.

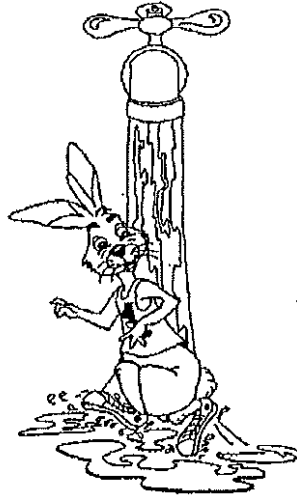
Tips for flushing:

- 💧 Other household water uses will also help clear standing water from your home's plumbing. For example, you may want to establish a routine of doing household tasks that use water—such as showering, flushing the toilet, or running the dishwasher—first thing in the morning before using water for drinking or cooking. Keep in mind that you'll still need to flush individual faucets for a short time before using them for drinking water.
- 💧 The water you run from drinking water taps does not have to be wasted. You can use this water for cleaning purposes or for watering plants.
- 💧 You may want to keep a container of drinking water in your refrigerator, so you don't have to run water every time you need it.

Use Only Cold Water for Cooking and Drinking. Hot water dissolves lead more quickly than cold water, so don't use water from your hot-water faucet for cooking or drinking. If you need hot water for cooking or drinking, take water from the cold tap and heat it. It is especially important not to use the hot water for making baby formula.

Will water treatment devices help?

Some treatment devices can reduce the amount of lead in your drinking water. Reverse-osmosis and distillation units can be used for that purpose. A few types of water filters also remove lead. Check the product literature to be sure it has been certified for lead removal by NSF International (<http://nsf.org>). Also, you must follow the manufacturer's recommendations for operation and maintenance to ensure that the treatment equipment works correctly.



Let it run!

How can I get my water tested for lead?

Testing for lead can help determine if there is too much in your drinking water. Many laboratories can test your water to see if there is a lead problem. Fees will vary between labs. Check your Yellow Pages under "Laboratories-Testing."



Minnesota Department of Health *Division of Environmental Health*
625 North Robert Street P. O. Box 64975 St. Paul, Minnesota 55164-0975
<http://www.health.state.mn.us/divs/eh/water>



141-0715
September 2007

What is the State of Wisconsin doing about the problem of lead in drinking water?

- DNR rules establish a lead "action level" of 15 ug/L (micrograms per liter) in public water systems.
- All community and non-transient non-community water system owners are required under DNR rules to regularly test high-risk locations for lead. If more than ten percent of the locations exceed the action level the system owner must conduct a public education program and install system-wide treatment to reduce corrosion.
- DNR well and facility construction rules currently prohibit the use of lead in wells, pumps, and other water system components.
- Department of Commerce rules currently restricts the use of lead in solder, fluxes and plumbing system piping.
- DNR will continue to work with community water systems to reduce the corrosivity of the water through central treatment. System-wide corrosion control can be designed to either reduce the actual corrosivity of the water, or to coat the piping with an additive which acts as a barrier between the pipe and the water.
- DNR will continue to provide updated information on the issue of lead in drinking water.



Where can I get more information?

The DNR has more information about drinking water and groundwater protection on its website at dnr.wi.gov. Choose "Drinking Water & Groundwater" from the drop-down program menu and select from a variety of listed topics.

Northern Region
810 W. Maple Street
Spooner, WI 54801
(715) 635-2101
OR
107 Sutliff Avenue
Rhineland, WI 54501
(715) 365-8900

South Central Region
3911 Fish Hatchery Road
Fitchburg, WI 53711
(608) 275-3266

West Central Region
1300 W. Clairemont
PO Box 4001
Eau Claire, WI 54702-4001
(715) 839-3700

Southeast Region
2300 N. Dr. Martin
Luther King, Jr. Drive
Milwaukee, WI 53212
(414) 263-8500



Northeast Region
2984 Shawano Avenue
P.O. Box 10448
Green Bay, WI 54307-0448
(920) 662-5100

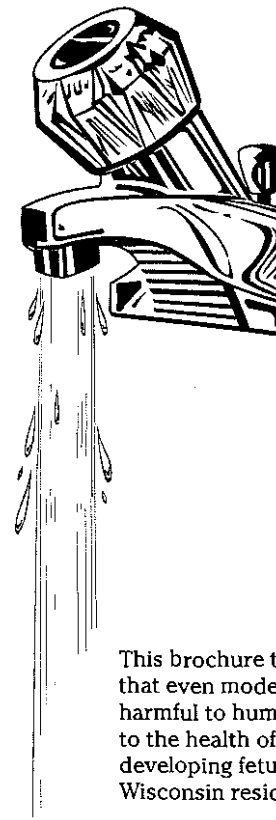
Central Office
101 S. Webster
P.O. Box 7921
Madison, WI 53707-7921
(608) 266-0821

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services and functions under an Affirmative Action Plan. If you have any questions, please write to: Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.

This publication is available in alternative format (large print, Braille, audiotope, etc.) upon request. Please call (608) 266-0821 for more information.



PUB-DG-015 2008



Lead in Drinking Water

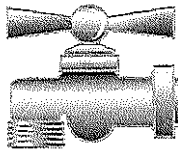
This brochure tells of growing evidence that even moderate levels of lead can be harmful to human health, and particularly to the health of small children and developing fetuses. For this reason, Wisconsin residents are advised to:

- 1) run your water in the morning for two or three minutes, or until it gets as cold as it will get, before you drink it, or
- 2) find out how much lead your water is dissolving from your plumbing system.

Whether your water comes from a community water system or your own private well, this brochure will discuss the lead issue in some detail, and will provide some specific recommendations for a variety of situations.

The Wisconsin Department of Natural Resources Bureau of Drinking Water & Groundwater would like to thank the Groundwater Coordinating Council (GCC) Education Sub-Committee for their part in the development and editing of this publication. For more information on the GCC, its member organizations and programming, please visit wisconsin.gov. Choose "Government," "State Agencies," followed by "List of Agencies" then select "Groundwater Coordinating Council."

Wisconsin Department of Natural Resources
Bureau of Drinking Water & Groundwater



What is Lead? *What is it & how dangerous?*

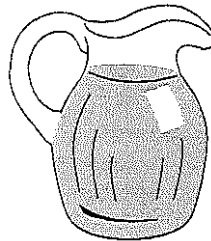
Lead is a toxic metal which has been used in the construction of most household plumbing systems in Wisconsin. Water within the plumbing system will continuously dissolve the lead it contacts. The rate can vary greatly with variations in natural water quality and the age of the plumbing system. Most water in Wisconsin is corrosive enough to dissolve some amount of lead. When the water stands for extended periods of time, such as overnight, lead concentrations in the water can increase greatly.

Lead is widespread in the environment, and people absorb lead from a variety of sources every day. Although lead has been used in numerous consumer products, the most important sources of lead exposure to the general population are:

- Lead-based paint
- Food (which can be contaminated by lead in the air or in food containers, particularly lead-soldered food containers)
- Soil and dust (which has been contaminated by air, and includes dust both inside and outside the home)
- Outside air from vehicle emissions and other sources. These have been reduced significantly since placing federal controls on lead in gasoline
- Drinking water (from the corrosion of plumbing systems)

It is estimated that lead in drinking water contributes between 10 and 20% of total lead exposure in young children. Food is the greatest single source of lead for the average adult.

What does lead get into my water supply?



Most Wisconsin drinking water sources, either wells or lake water intakes, have little or no measurable lead. The source of lead in drinking water is most likely lead pipe or solder in the house water supply plumbing, or lead service lines which join buildings to street water mains.

Under typical circumstances, lead will dissolve into the water. The concentration of lead in drinking water can vary greatly, depending on the corrosivity of the water, the type and age of the plumbing materials used in the house, and the length of time that the water stands in the pipes. The highest levels of lead occur when very corrosive water stands motionless in lead or lead-soldered copper pipe for long periods of time.

Corrosivity varies greatly with water quality, but hard water is generally less corrosive than soft water. Nevertheless, hard water alone does not always guarantee that there will be no elevated lead levels.

A greenish discoloration and unpleasant taste of tap water are indications that copper pipes are corroding, but significant corrosion can occur even if there are no visible indications.

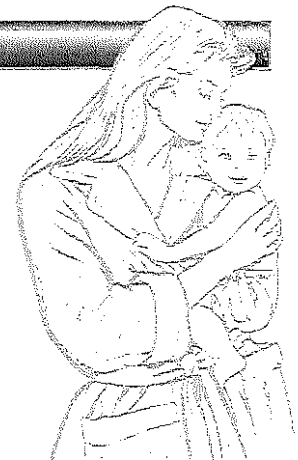
The age of a house relates to the type of plumbing system that can be expected. Through the early 1900s, lead pipes were commonly used for interior plumbing in some areas. Until the 1940s, lead piping was often used for the service lines that join buildings to street water mains. Lead piping can be recognized as a dull-grey metal which is soft enough to be easily scratched with a key or screwdriver. Scratched lead will be shiny underneath.

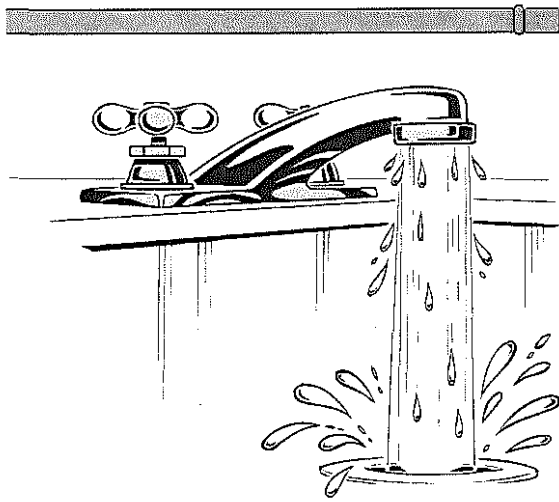
In the 1930s, copper pipes or galvanized steel pipes replaced lead pipes in most residential plumbing. However, the use of 50/50 tin/lead solder and lead-containing fluxes to join copper piping continued in Wisconsin until a ban on the use of lead solder and fluxes became effective in 1984. Homes constructed after that date should have "lead-free" water supply plumbing systems. Also, any repairs of existing plumbing systems must be made with "lead-free" materials, such as tin/antimony (95/5) solder.

Studies indicate that the levels of dissolved metals in drinking water will decrease as a building ages. This is because, as time passes, a mineral or oxidation coating forms on the inside of the pipes (if the water is not too corrosive). This coating can partially insulate the water from the lead materials, significantly reducing levels of dissolved lead.

The longer water stands in a pipe the more lead can be dissolved. Because lead will continuously dissolve into the water, the resulting lead concentrations will increase directly with time. This is why water which is drawn first thing in the morning, or after any extended period of nonuse, will contain the highest levels of lead.

Federal and state standards have established an action level of 15 parts per billion (ppb) for lead in drinking water. The standard is adjusted to account for average lead exposures from other environmental sources as well. Nevertheless, lead has no beneficial health effects, and it is advisable to reduce the lead in your tap water as much as possible. This is particularly true for pregnant women or young children who may drink the water.



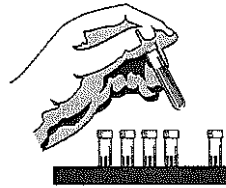


How does lead affect my health?

Lead absorbed by the lungs and the digestive tract from all sources enters the bloodstream, where it distributes to all tissues of the body. Excessive levels of lead can damage the brain, kidneys, nervous system, red blood cells and reproductive system. The degree of harm is directly related to the level of lead in the blood (from all sources). Known effects of exposure to lead range from subtle changes in body chemistry and nervous system functions at low levels of exposure, to severe toxic effects or even death at very high levels associated with acute poisoning. Some harmful effects are reversible if exposure is reduced, while other harmful effects can be permanent.

Young children, infants and fetuses appear to be particularly vulnerable to harmful effects of lead. A dose of lead that would have little effect on an adult can have a big effect on a small child. Also, growing children will more rapidly absorb any lead they consume. A child's mental and physical development can be irreversibly stunted by over-exposure to lead. In infants, whose diet consists of liquids made with water – such as baby formula – lead in drinking water makes up an even greater proportion of total lead exposure (40 to 60%).

There are certain obvious advantages to having your water tested for lead, including knowing exactly how high your lead levels rise after periods of nonuse. Even if you live in an older home with no lead piping and are in a hard water area, a lead test can confirm that there is little or no lead in your “first-draw” sample. If testing shows lead in your first drawn water, a lead test before and after flushing can confirm if your flushing procedure is working.



If you decide to have your water tested, it is recommended that you use a state certified laboratory which can detect lead in drinking water at 5 parts per billion or less. There are a number of laboratories statewide that can provide drinking water sampling materials and instruction. A list of certified labs is available from your drinking water & groundwater specialist at your DNR regional office or online at: dnr.wi.gov/org/es/science/lc/LABS/LabLists.htm or check your local yellow pages. Persons served by a public water system should contact the system owner to determine whether there has already been testing of homes with plumbing materials and an installation date similar to yours.

Private Wells

In addition to plumbing corrosion concerns, there are several other potential sources of lead in private wells. If your well draws water from a sand and/or gravel formation, you should know that some well screens contain lead, and many have been installed with a “lead packing collar.” If such a device is contributing lead to your water, flushing will probably take longer. It is recommended that you have your water tested for lead.

If you own a “driven-point” well, and if you have ever “shot” the well to clear the screen, you have another potential source of lead in your water. Some individuals have actually poured lead shot into a well to keep out sand. Lead wool has also been placed in some wells. (None of these practices has ever been recommended.) In any of these cases, it is recommended that you have your water tested for lead.

If you live in a former lead-zinc mining region of extreme southwest Wisconsin or if you live near existing or former cherry orchards in Door County, you may have lead in your groundwater. It is recommended that you have your water tested for lead.

If you have lead in your groundwater, flushing will not be effective. Point-of-use treatment devices, such as reverse osmosis and distillation units can be effective in removing lead. However, they can be expensive, their effectiveness varies, and they must be properly maintained. All makes and models of treatment devices must be approved by the Wisconsin Department of Commerce. Department of Natural Resources approval may be required, under certain conditions, for the installation of a point of use treatment device. Contact the Bureau of Drinking Water and Groundwater at (608) 266-0821 or one of the DNR offices listed at the end of this brochure for additional information.

If a treatment device is installed, set up an effective and practical maintenance and monitoring program to be sure the system is maintained as recommended by the manufacturer. This is the best way to be certain that it is doing the job intended.

Bring in water from a known safe supply.

A new house

If your house was constructed after September 26, 1984, state law requires that the soldered joints be "lead-free." To check on this, try to scratch the outside of the solder at a pipe joint with a key or screwdriver. If the solder is dull in appearance, scratches easily, and is shiny underneath, it may be illegally-installed 50/50 lead/tin solder. Tin/antimony (95/5) solder, the typical replacement for lead solder, remains bright in appearance, and there is often a slight gap or indentation in the solder where the pipe and fitting meet. Lead solder usually bridges this gap completely.

If you suspect that lead solder was used in the construction of your plumbing system, have a "first-draw" sample of your water tested for lead. If lead is found at levels over 10 ppb, contact your local plumbing inspector or the Wisconsin Department of Commerce, Safety and Buildings Division at (608) 266-3151 or visit their Web site at commerce.state.wi.us, for further advice. (Lead often occurs in other metallic alloys such as brass and bronze and small amounts can occur in copper pipe itself.)

How can I reduce my exposure to lead in drinking water?

If your house was constructed before October, 1984, the easiest and most effective method of reducing lead in drinking water is not to drink water that has been in contact with your house plumbing for more than 6 hours, such as overnight or during your work day. Before using water for drinking or cooking, flush the cold water faucet by allowing the water to run until the water has become as cold as it will get (usually 2-3 minutes).

You must do this for each drinking water faucet – taking a shower will not flush your kitchen tap. Shower, toilet, or cold water laundry use will, however, partially flush the plumbing, and will often reduce the time needed to flush drinking water faucets. Buildings constructed prior to the 1940s may have service lines made of lead. Letting the water run for an extra 15 seconds after it cools should also flush this service line.

Studies by the DNR have shown that such flushing can reduce lead levels from hundreds of parts per billion to less than 3 parts per billion (the current detection limit at the State Laboratory of Hygiene). Water flushed from the taps – usually one to two gallons – can be collected and used for nonconsumptive purposes such as washing; it needn't be wasted. (NOTE: The flushing procedures outlined above will usually be inadequate in large buildings such as apartment complexes.)

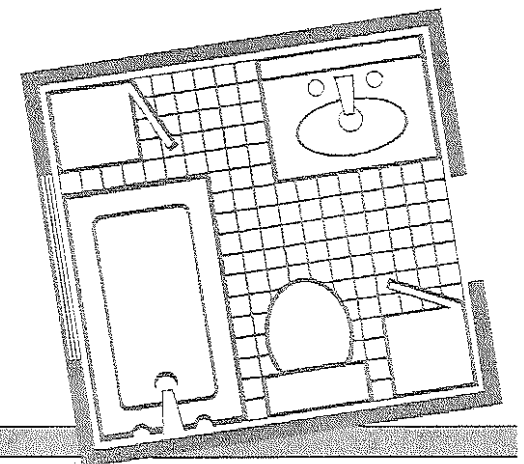
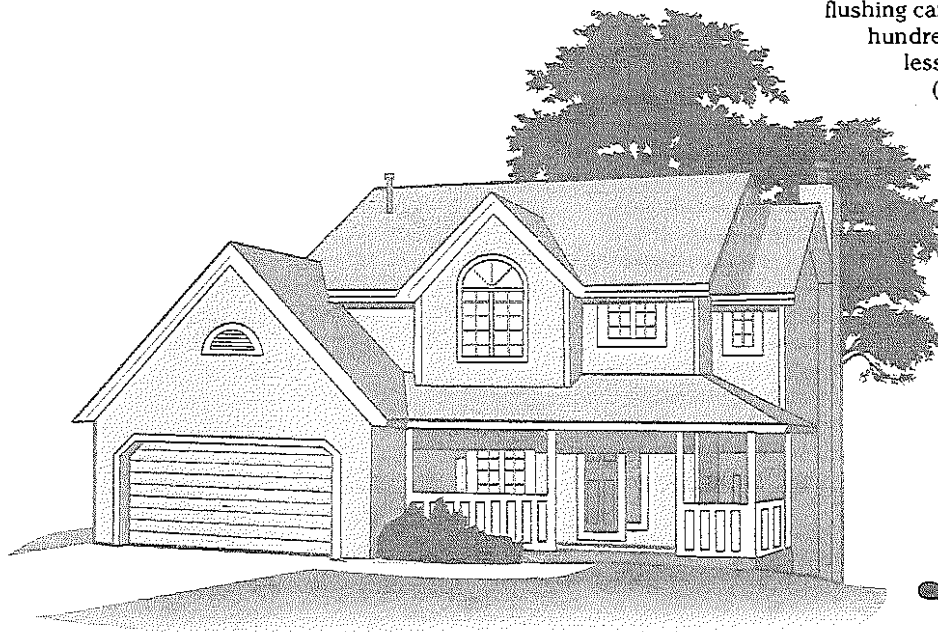
Another recommendation for reducing lead exposure is to **never cook with or drink water from the hot-water tap**. Hot water dissolves lead more quickly than cold water. So, do not use water taken from the hot tap for cooking or drinking and especially not for making baby formula.

Must every plumbing system be flushed in the morning? Not in all cases. Compliance samples collected show that, in areas with high water hardness, little or no detectable lead was found in homes which met all of the following conditions:

- 💧 Very hard, alkaline water (generally total hardness greater than 300 parts per million, reported "as calcium carbonate"),
- 💧 Water supply plumbing system more than five years old
- 💧 No lead piping
- 💧 No lead service line connecting to street water main

The individuals in these homes do not need to flush their house plumbing if water is used daily and many others with a similar situation will probably find few problems. You can contact your water utility or supplier for information on the level of water hardness in your area, as well as other information available on first-draw lead levels in the area.

A word of caution: with the limited data available, it is not possible to **guarantee** that all homes with the above characteristics will have little or no detectable "first-draw" lead levels. If you do not have your water tested, flushing is a simple precaution.



WHAT IS LEAD?

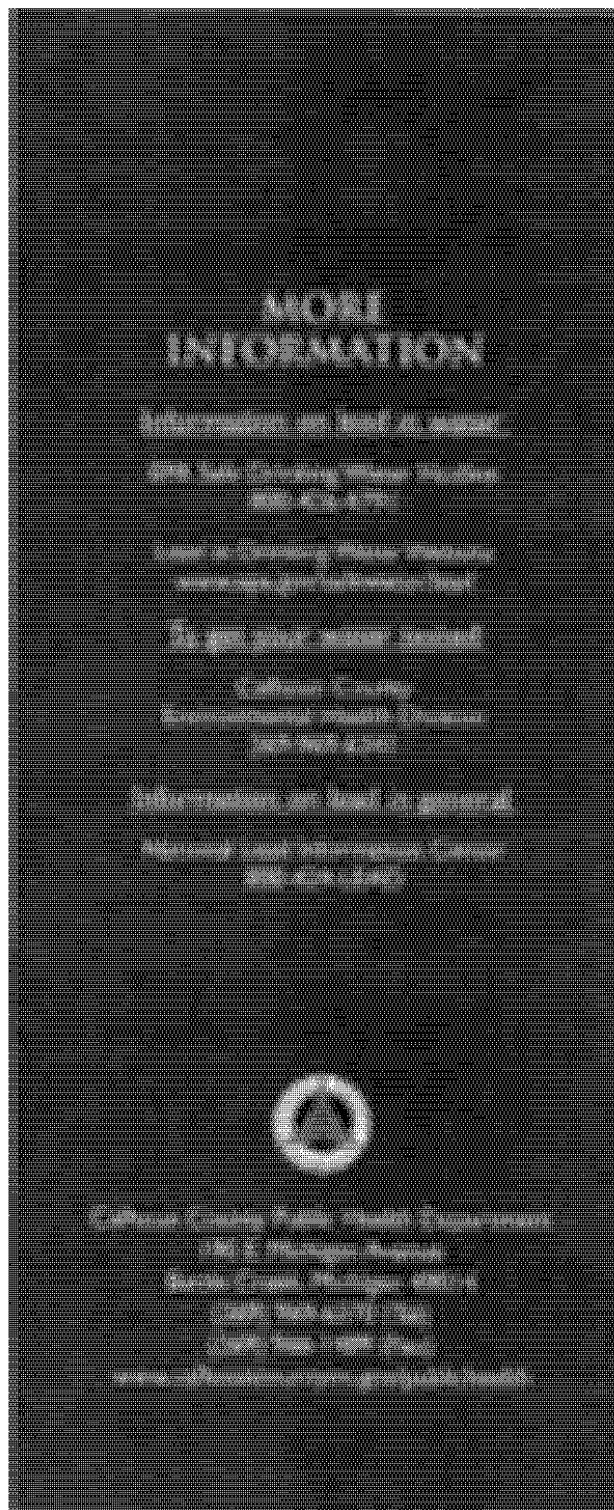
- Lead is a toxic metal that is harmful if inhaled or swallowed.

WHAT HEALTH EFFECTS CAN LEAD CAUSE?

- At high levels, lead can cause serious illness affecting many parts of the body.
- More often, low levels cause learning disabilities without any obvious illness.

WHO IS AT RISK?

- Children ages 6 and under are at greatest risk.
- Pregnant women and nursing mothers should also avoid exposure.



CALHOUN COUNTY PUBLIC HEALTH DEPARTMENT

IS THERE
LEAD
IN MY
DRINKING
WATER?



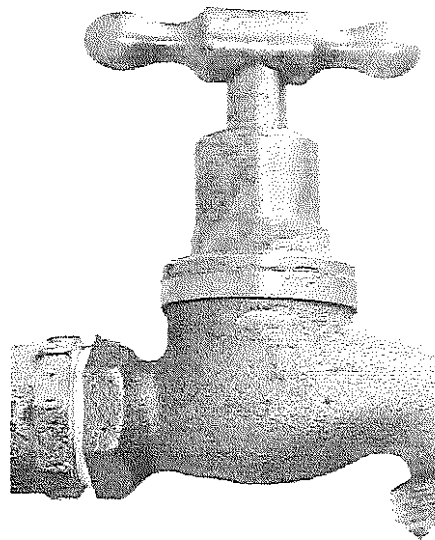
Tips for Protecting Your Family's Health

HOW DOES LEAD GET INTO WATER?

Lead enters tap water through contact with your plumbing.

Some plumbing parts contain lead. Water can absorb lead as it flows through them.

Today, plumbing parts made for drinking water contain very little or no lead. However, the plumbing installed in your home probably has more lead in it than plumbing being installed today. Here are some examples of plumbing materials that contain lead:



- Interior lead pipes, which were often installed in new homes until around 1930.

- For city water users, an underground lead pipe connecting your home to the water main. This is most likely for homes built before 1950.

- Lead solder at copper pipe joints. Lead solder was banned for use on drinking water pipes in 1987.

- Brass or bronze parts, including chrome-plated faucets. Brass tends to contain about 5% lead, but the percentage used in faucets has dropped, starting in the late 1990s.
- Laundry room faucets and outdoor faucets, which can be higher in lead, since they are not intended for drinking use.

HOW DO I KNOW IF THERE IS LEAD IN MY WATER?

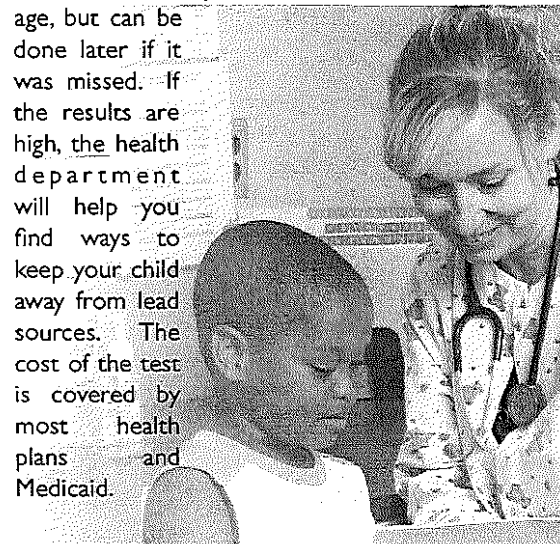
Testing the water at the faucet is the only way to know for sure. Testing the faucets you use for drinking water is a good idea for both well owners and city water users. City water departments test their water for lead, but these tests can't rule out problems caused by your home's plumbing.

You can visit the Environmental Health office to pick up a test kit. We are located at 190 E. Michigan Ave., Battle Creek. The test costs \$24. Or, you can purchase a mail-in test kit from a home improvement store.

If a test shows a high level of lead (above 15 ug/L or 0.015 mg/L), call the Safe Drinking Water Hotline at 1-800-426-4791 to learn more about reducing the level.

SHOULD MY CHILD BE TESTED?

A simple blood test can check for lead in your child's body. Thousands of children in Calhoun County get tested every year. You can ask your health care provider if testing is recommended for your child. The test is usually done at 12 and 24 months of age, but can be done later if it was missed. If the results are high, the health department will help you find ways to keep your child away from lead sources. The cost of the test is covered by most health plans and Medicaid.



QUICK TIPS TO REDUCE LEAD IN YOUR DRINKING WATER

- Don't drink water that stood in your plumbing for more than 6 hours. First run the water until the temperature stops changing.
- Don't run hot water for drinking or cooking. For infant formula, heat cold tap water with a stove or microwave.
- Once a month, remove the aerator from your faucet, and clean the inside.
- If you plan to buy a home water filter, check the box to see if it's certified to remove lead.
- To help block the effects of lead, serve your family meals that are low in fat and high in calcium and iron, including dairy products and green vegetables.
- Boiling your water will NOT get rid of lead.



Rennaker, Joanne (DEQ)

From: Pallone, Maggie (DEQ)
Sent: Friday, October 16, 2015 2:55 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ)
Cc: Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: RE: Action Steps for the week of October 19th

Additional action items:

After Action Review panel
 Staff hiring plan
 \$1 million for lab billing code
 Introduce Part 54 legislative changes
 Finalize FY 17 budget request

Thanks George.

Maggie

From: Krisztian, George (DEQ)
Sent: Friday, October 16, 2015 8:50 AM
To: Shekter Smith, Liane (DEQ) <SHEKTERL@michigan.gov>; Busch, Stephen (DEQ) <BUSCHS@michigan.gov>; Cook, Pat (DEQ) <COOKP@michigan.gov>; Prysby, Mike (DEQ) <PRYSBYM@michigan.gov>; Wurfel, Brad (DEQ) <WurfelB@michigan.gov>; Pallone, Maggie (DEQ) <PalloneM@michigan.gov>; Tommasulo, Karen (DEQ) <TommasuloK@michigan.gov>
Cc: Shaler, Karen (DEQ) <SHALERK@michigan.gov>; Thelen, Mary Beth (DEQ) <THELENM2@michigan.gov>; Wyant, Dan (DEQ) <WyantD@michigan.gov>; Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Subject: Action Steps for the week of October 19th
Importance: High

I need to have 25 additional action steps for the week of October 19th. I would like at least 15 steps from Liane's group and 10 from exec. Please submit your steps to the whole group by 4:00 PM today.

Given how tight everyone's schedule is we will try to do this electronically. If it works, then we will make this a weekly deadline. If it doesn't work then we will have weekly meetings.

Thank you!
 George

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

Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, October 13, 2015 4:33 PM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: Action Steps Update

George,

Below is a status update on the action steps assigned to me:

Action Step 6: Approve Flint Plan for waterline

The city and the county flushed the pipeline beginning yesterday just after 4pm and the free chlorine residual dropped to less than 2.0 ppm by 2:00am this morning. Based upon my discussion with Genesee County operators, the first set of samples for total coliform analysis were collected around 2:30am at the mid-point location along the 3.5 mile of de-commissioned pipeline and at Control Station 3 (on Flint WTP grounds).

The highly chlorinated water (approx 3.5 Mgal) was passed through to the Dort Reservoir (on WTP grounds) and was to be diluted by filling the reservoir to its 20 Mgal capacity; however, I suspect that some wasting of the water to the sanitary sewer will be necessary since the chlorine residual (3.5 mgal) was approx 100 mg/l. I was unable to confirm this with Flint operators (I tried to contact them several times today with no success).

Genesee County will be collecting their second sample for bacteriological analysis between 6 and 8pm at the pipeline mid-point. I suspect that it will take additional time to flush the Dort Reservoir before it is ready to be sampled and may set back the time that the pipeline is ready to be placed into operation (Thurs the soonest possible). The yard piping configuration at the WTP does allow for flexibility in operation and ability to take Dort out of service and maintain supply from Detroit; however, I have not been able to confirm that this is the way the city plans to proceed.

Action Step 19: Expedite 399 plan and P04 plan

I contacted Samir Matta from LAN (Flint's consultant) for an update on the corrosion control plan and submittal of the Act 399 permit application. Flint operators, with the assistance of LAN, conducted bench tests using a corrosion inhibitor (orthophosphate) and are making comparisons for use with (treated water from Detroit vs. water treated from the Flint River). LAN is currently preparing plans and a design for installation of an orthophosphate

feed system at Control Station 2 and Pump Station #4 (on WTP grounds) with the ability to relocate the feed equipment when Flint switches to the KWA. LAN expects to submit the Act 399 permit application to the DEQ by no later than the end of this week.

Action Step 18: Contact KWA to find out if there are any bottlenecks that need to be removed to expedite completion of the KWA pipeline.

I contacted John O'Brien (Genesee County Drain Commissioner's Office). The most significant bottleneck involves road restrictions currently being imposed by the Lapeer County Road Commission and include:

- All Lapeer County secondary north-south roads are tagged "no construction traffic" for this project except for primary roads (M-19, M-53, and M-24). This significantly increases distances that construction vehicles must travel (upwards of 15 to 20 miles) to accomplish a short jog either north or south.
- Weight restrictions in the spring will cause construction to slow or stop for one to two months. The county has indicated that St. Clair and Sanilac are not imposing the weight restrictions; however, Lapeer County will maintain their restrictions.

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

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, October 16, 2014 8:45 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Another Flint complaint

This complaint came thru the SDWA Hotline. Interesting—this citizen reported that General Motors shut off their line to Flint water due to over-chlorination. See the link below.

Jennifer

From: Poy, Thomas
Sent: Wednesday, October 15, 2014 12:07 PM
To: Crooks, Jennifer
Subject: FW: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan

Jen: Can you use the same reply for the control to reply to this similar complaint about Flint water?

Thanks.

Tom

Tom Poy
 Chief, Ground Water and Drinking Water Branch
 USEPA - Region 5
 (312) 886-5991

From: howard.donna@epa.gov [<mailto:howard.donna@epa.gov>]
Sent: Wednesday, October 15, 2014 11:46 AM
To: Poy, Thomas
Subject: FWD: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan

10/15/2014

SUBJECT: FWD: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan
 FROM: howard.donna@epa.gov
 TO: poy.thomas@epa.gov
 CC:

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

10/14/2014 9:07 AM

HQ LEAD NUMBER: FY15-122649-3715-CV

SUBJECT: Referred to Region - Michigan

FROM: janburgess52@comcast.net

TO:

Name: Jan Burgess

Address: 720 Commonwealth Ave

City: Flint

State: Michigan

Zip: 48503

Phone: 810-235-6530

Alleged Violator's Name: City of Flint

Alleged Violator's Address: 1101 S. Saginaw St.

Alleged Violator's City: Flint

Alleged Violator's State: Michigan

Alleged Violator's Zip: 48502

Tip or Complaint: Earlier this year, the City of Flint, MI changed its water supply from the City of Detroit [Lake Huron] to the Flint River. This river has a very long history of pollution. Since this change, our drinking water has tripled in cost and the quality varies daily. Some days it smells like an over-chlorinated swimming pool; other days, like pond scum. It often is brown in color and frequently has visible particles floating in it. We've been under several boil water advisories due to e-coli contamination. Just this morning our local paper reports that General Motors Engine plant has shut off Flint River water to the plant due to the over-chlorination and the fears that the water will cause corrosion.

http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html#cmpid=nsltr_stryheadline.

People in Flint have had to resort to buying bottled water or having purification systems installed in their homes. Some residents have even had private wells dug. The water is not safe to drink, cook or wash dishes with, or even give to pets. We worry every time we shower. The City of Flint is still very economically depressed and most citizens cannot afford to do anything other than use the river water. Many of them have NO water at all due to the extremely high water bills. There is reasonable suspicion that reports have been falsified. Some residents have had water tested privately and the results are not even close to those reported by the City. Calls to the City and State have resulted in no action whatsoever.

Violation Still Occurring? Yes

State DEP/DEQ/DEM Notified? No

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, June 02, 2015 8:28 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Benzie, Richard (DEQ); Philip, Kris (DEQ); Shekter Smith, Liane (DEQ)
Subject: April 27 Flint Sampling Update from Miguel

Mea culpa.... I totally missed this email. Just saw it today. You already know the general information, but here is directly from Miguel.

Jennifer

From: Deltoral, Miguel
Sent: Monday, April 27, 2015 6:53 AM
To: Poy, Thomas
Cc: Porter, Andrea; Bair, Rita; Crooks, Jennifer
Subject: Flint Sampling Update

Good morning, Tom

Just an update on the Flint sampling so folks know what's going on. As we had initially discussed, the only way to really see what the lead levels are throughout and where the lead is actually coming from at Ms. Walters' place is to do sequential sampling prior to the removal of the LSL. I spoke to Ms. Walters and she said that the water was shut off inside her home, so it can actually be turned back on, so Jennifer and I picked up sample bottles from the R5 office and we will be dropping them off at Ms. Walters place today on the way home from the MDEQ RTCR meeting. Pat Cook has confirmed that following the disconnection from Detroit, Flint has not been operating any corrosion control treatment, which is very concerning given the likelihood of LSLs in the city. We do not know how many LSLs there are in Flint and according to Ms. Walters, neither does the city. She said that they do not know where any LSLs are, based on their records, so other than what appears to be a very long one at Ms. Walters' place, we don't have confirmation of any others at this point. Since they were used extensively here in R5, it is likely there are more. No idea how many, though.

Marc Edwards (from Virginia Tech) was kind enough to offer to analyze this round of samples so she will shipping the samples to Marc for analysis. I asked that he measure phosphate as well, so that we have some data on that. As we discussed, R5 will send an additional set of bottles to Ms. Walters for the follow-up monitoring once the LSL is removed. I spoke to Mike Prysby on Friday and he said that the city was going to remove the LSL fully this Wednesday. I also brought a camera with me and will take some pictures while we are at Ms. Walters place as well.

Apparently, according to Ms. Walters, the water director appears to be telling residents that the high lead from Ms. Walters residence is from the internal plumbing and that a reporter she was talking to, as well as others, has confirmed that this is what residents are being told. Ms. Walters indicated that the line coming into the home appears to be galvanized pipe. If this is true, it is possible that her portion of the service line, from the home to the property line, is not lead and that the city-owned portion of the service line is the only source of lead here. The sample results should help to clarify where the lead is coming from.

Call me on the cell if you need to: 312.659.5827

Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, August 05, 2013 3:43 PM
To: Thomas, Chuck (DEQ); Bloemker, Jon (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Donaldson, Kristina (DEQ); Lachance, Amy (DEQ)
Cc: Willard, Veronica (DEQ); Byrne, Randall (Treasury)
Subject: Assistance for Treasury

All –

I recently spoke with Randall Byrne (Treasury) and agreed to try to help them with a couple of items. (Randy – sorry it's taken me so long to get this note out).

1. Flint is considering selling the 72-inch pipeline. It was constructed in 1965 for \$6.5M. How would you determine fair market price for such an item? I suggested getting quotes from a couple of contractors for what it would cost to install today and figure some kind of depreciation for a 50 year old pipeline. Other ideas?
2. Highland Park is looking at contracting out their water department for the near future. At this point, they would need a company that could manage their distribution system. Could you please provide a list of names/companies that are already doing this kind of work around the state? United Water and Earth Tech were the ones that came to mind. There must be others.

Thanks much.

Liane

Liane J. Shekter Smith, P.E., Chief
 Office of Drinking Water and Municipal Assistance
 Michigan Department of Environmental Quality
 517-373-9523

*** Effective August 12, 2013 my new number will be (517) 284-6543*

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Friday, June 26, 2015 5:41 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ)
Subject: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

Steve and Mike; referring to the bios I sent you all last Monday, 6/22, of Mike Schock and Darren Lytle, I was wondering if you've had a chance to discuss Mike and Darren's participation in evaluating treatment/water quality/lead levels with the City of Flint?

Perhaps I can answer any questions you might have about their participation with you all?

Jennifer

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Wednesday, September 17, 2014 2:53 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Boil Water Advisory Report
Attachments: Boil Water Overview_Memorandum.pdf

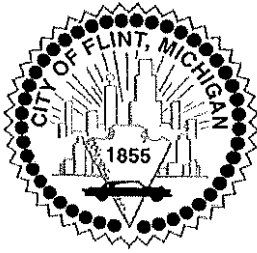
Mike,

I wanted you to have a copy of the report I sent to the Mayor and EM today as an overview of the recent boil water advisory. Please let me know if anything here appears amiss.

Thanks,

--

Howard Croft
Public Works Director
City of Flint
1101 S. Saginaw Street
Flint, MI 48502
PH# 810.766.7346 Ext.2043
hcroft@cityofflint.com



Dayne Walling
Mayor

CITY OF FLINT
Department of Public Works

Darnell Earley, ICMA-CM, MPA
Emergency Manager

Howard Croft
Director

MEMORANDUM

TO: Darnell Earley, Emergency Manager
Dayne Walling, Mayor

FROM: Howard Croft, Public Works Director

DATE: September 16, 2014

RE: Recent Boil Water Advisory

Mr. Earley,

I have compiled a bullet point list of the pertinent events surrounding the recent boil water advisory in the City of Flint. I have separated the events into five categories and attempted to condense them into a comprehensive sequence for your review.

OVERVIEW

- On Friday September 5, 2014 the City of Flint issued a boil water advisory to residents in two of ten test areas around the city.
- The advisory was due to multiple positive tests for "total coliform" and the area covered approximately 9 square miles.
- On Sunday September 7, 2014 the City expanded the advisory to include another of the ten test areas due to a subsequent positive total coliform test.
- The boil water advisories were lifted on Tuesday September 9th at 5:00pm after consultation with the DEQ.

BACKGROUND

- State of Michigan Regulations requires that the City of Flint Water Treatment Plant perform testing of its water distribution system on a routine basis in ten different locations around the City.
- The tests take twenty four hours to produce valid results and are sent directly to the Department of Environmental Quality for review.
- Test results which show positive for "E.coli" or "fecal coliform" trigger boil water notices for the test area and the advisories usually remain in effect until three consecutive tests return negative results.
- A single positive test for "total coliform" does not generally result in a boil water advisory, rather it indicates that the environment is conducive for bacteria.
- Typically, investigation into possible causes followed by corrective measures such as flushing the affected area with open hydrants will cleanse the system.
- This process is overseen by an employee who is required to hold an F-1 State License and is listed as the Operator in Charge of the Water Plant and an employee who holds an S-1 State License which is required to maintain distribution systems of this municipal size.
- The City of Flint has over 500 miles of pipe in its distribution system, much of which is over 70 years old.
- The City of Flint has over ten-thousand valves throughout its distribution system.
- The City of Flint has a professional reliability study of its system which was updated in December 2013.

PROBLEM

- ❖ After detecting the initial positive test for total coliform, normal procedures did not clear the condition and multiple positive tests ensued.
- ❖ The continued positive total coliform tests were the cause for issuing the boil water notice.
- ❖ Additional discoveries showed that residual chlorine levels in the affected area were considerably lower than normal.

SOLUTION

- ✓ On Monday September 8, 2014 the City convened all licensed personnel, Utility Supervisors, and DPW Director to a single meeting location and held a brainstorming session with the DEQ on conference call.
- ✓ It was agreed that while not totally isolated, the concern was mainly present in a specific large transmission line that ran through all positive testing areas.
- ✓ It was determined to expand the hydrant flushing outside of the immediate impact area.
- ✓ It was found that a 24" valve which feeds this transition main was broken in the OFF position outside of the immediate impact area.
- ✓ The broken valve was preventing fresh water from being pushed directly into the impacted area while causing water to travel from the water plant around the entire city and preventing adequate circulation of fresh water.
- ✓ After repairing the broken valve, virtually all of the symptoms were erased over a 24 hour period and the chlorine count has steadily risen back to normal levels throughout the transmission main.

CONCLUSION

- ✓ It was determined that the broken valve was not the single cause of the problem but was a significant factor in the development of the problem.
- ✓ Other possible factors include:
 - Low usage in the area
 - Pipe size in relation to volume of usage
 - Temperature change of surface water
 - Water Pressure in the area
- ✓ It was determined that the broken valve was the main reason that normal remedies were ineffective.
- ✓ Throughout the event, the City was in direct contact with DEQ personnel daily.
- ✓ The positive tests were for "total coliform" only.
- ✓ The following statement about total coliform was approved by the DEQ and distributed to the public as part of the recent boil water advisory:

Total coliform bacteria are generally not harmful themselves. Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

Usually, coliforms are a sign that there could be a problem with the treatment or

distribution system (pipes). Whenever we detect coliform bacteria in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing. If we had, we would have notified you immediately. However, we are still finding coliforms in the drinking water.

- ✓ The City of Flint is in the first year of strategic budgetary investment in an infrastructure strategy.
- ✓ The City of Flint infrastructure strategy has been, and will continue to be developed with state licensed employees, industry experts, and proven experienced consultants.

Howard D. Croft
Public Works Director

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Wednesday, March 26, 2014 2:22 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Arduin, Jim (DEQ)
Cc: Daugherty Johnson; Brent Wright (bwright@cityofflint.com)
Subject: Bray Road Alternative Separation Concepts.
Attachments: Piling Concept 3-24-14 (2).pdf - Adobe Acrobat.pdf; MC-3500 Chamber from ADS StormTech System.pdf

Hi All,

As requested, the following two concepts are being discussed with the City and ultimately with the contractor to see which one is more in line with the project budget and can be accomplished in a timely matter. The attached concept shows sheet piling being proposed which will be terminated at the designated height needed to achieve a 2' freeboard along the alignment highlighted in RED.

The other concept which we discussed on the phone will entail using a light weight storm chamber (see attachment) fastened to a 4x8 plywood sheeting, attached together, with a geotextile fabric along the back side to follow the same alignment as the sheet piling option. It will be placed directly on the existing lime sludge in front of the disposal area for separation.

Please review, let me know if you have any questions and we can further discuss on Monday.

Thanks.

Samir F. Matta, PE
 Senior Project Manager

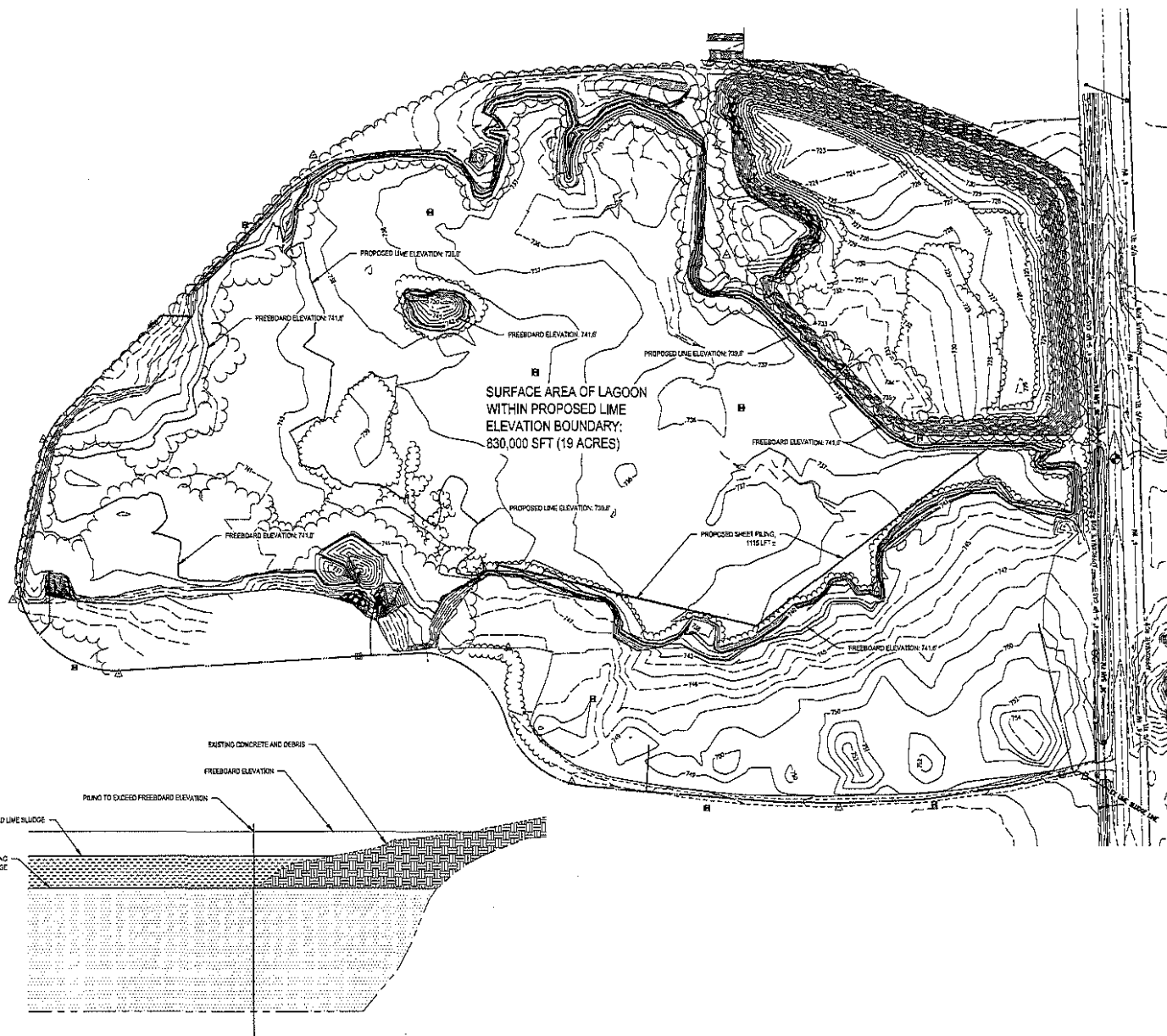


**Lockwood, Andrews
& Newnam, Inc.**
 A LEO A DALY COMPANY

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Project No. 130-10701-001
 Flint WTP Phase II, Segment II
 Lime Residual Disposal
 Flint, MI 48505
 Date: February 26, 2014



Flint WTP
 Phase II, Segment II
 Lime Residual Disposal
 Flint MI, 48505



lan Lockwood, Andrews
 & Newnam, Inc.
 PLANNING
 ENGINEERING
 PROGRAM MANAGEMENT
 1311 South Linden Road, Suite B
 Flint, MI 48532
 Tel: 810-420-2442 Fax: 810-420-2763

**ROWE PROFESSIONAL
 SERVICES COMPANY**
 The Howe Building
 444 S. Saginaw St., 2nd Floor
 Flint, MI 48502
 Tel: 810-341-1910
 Fax: 810-341-1925
 www.rowepsc.com

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

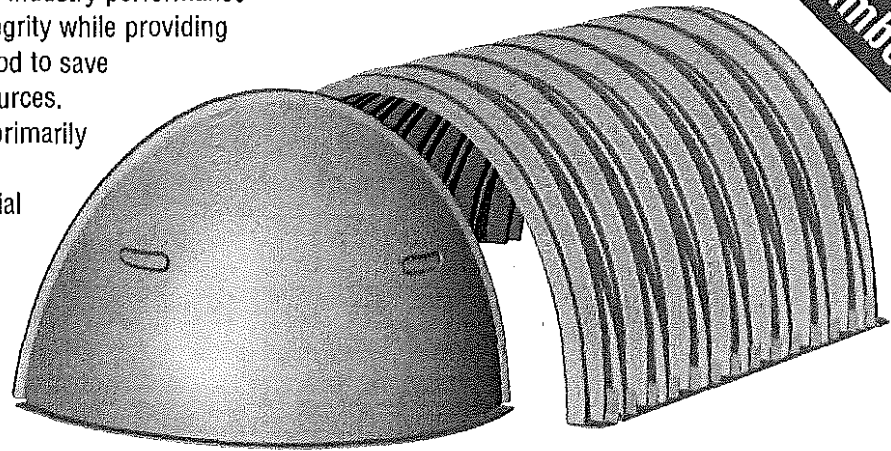
FILE LOG

REVISION	DATE

Project No. 130-10701-001
 Date: February 26, 2014

StormTech MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.



StormTech MC-3500 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)	90" (2286 mm) x 77" (1956 mm) x 45" (1143 mm)
Chamber Storage	109.9 ft ³ (3.11 m ³)
Min. Installed Storage*	178.9 ft ³ (5.06 m ³)
Weight	134 lbs (60.8 kg)

* This assumes a minimum of 12" (305 mm) of stone above, 9" (229 mm) of stone below chambers, 9" (229 mm) of stone between chambers/end caps and 40% stone porosity.

StormTech MC-3500 End Cap (not to scale)

Nominal End Cap Specifications

Size (L x W x H)	26.5" (673 mm) x 71" (1803 mm) x 45.1" (1145 mm)
End Cap Storage	15.6 ft ³ (0.44 m ³)
Min. Installed Storage*	46.9 ft ³ (1.33 m ³)
Weight	43 lbs (19.5 kg)

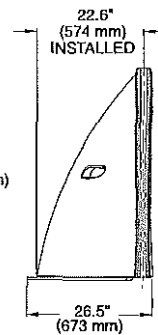
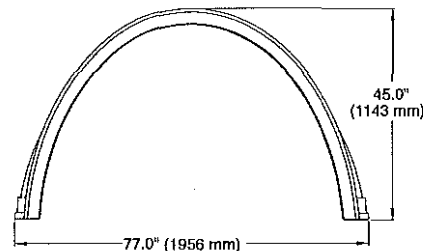
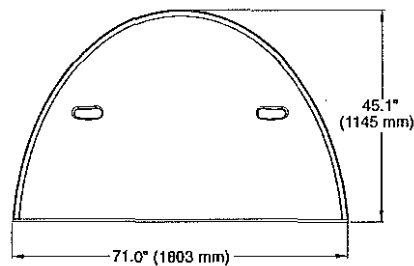
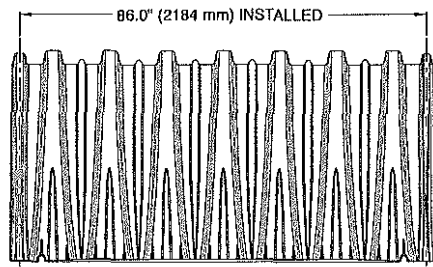
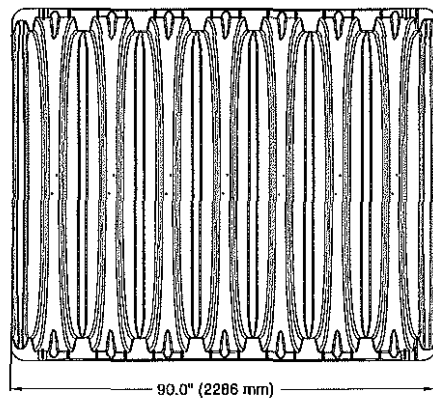
* This assumes a minimum of 12" (305 mm) of stone above, 9" (229 mm) of stone below, 6" (152 mm) of stone perimeter, 9" (229 mm) of stone between chambers/end caps and 40% stone porosity.

Shipping

15 chambers/pallet

16 end caps/pallet

7 pallets/truck



Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, March 21, 2014 2:33 PM
To: sfmatta@lan-inc.com
Cc: Busch, Stephen (DEQ); Arduin, Jim (DEQ)
Subject: Bray Road Lagoon Improvements - MDEQ Comments
Attachments: Bray Road - DEQ Comments March 2014.doc

Samir,

Attached are MDEQ's comments regarding the proposed work at the Bray Road site to allow re-use of the site for the disposal of WTP lime sludge. Please contact me at your earliest convenience if you have questions regarding our comments or wish to schedule a meeting.

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

**Flint WTP Improvements
Bray Road Lime Sludge Lagoon
MDEQ Comments
March 21, 2014**

1. The placement of the proposed liner and berm fails to establish physical separation between the lime sludge collection area and concrete fill area. For complete separation of these areas, the berm needs to be constructed down to native soil.

As proposed, this appears to constitute the first step towards a “cap-in-place” of the existing materials. If waste is left in place within the berm, the city will be required to construct the berm to meet Part 115 cap requirements. In addition, long term groundwater monitoring, financial assurance, closure and post closure plans will be required.

2. Please provide a residuals management plan for the lime sludge collection area. In addition to removal of new lime sludge produced, the plan must also include the gradual removal of existing lime sludge.
3. The working depth of the lime sludge collection area does not appear to meet 10-States Standard’s minimum depth of 5 feet. The available volume appears to be 60,000 cubic yards based on 2.6 feet of working depth. Please confirm this. What is the surface area of the lagoon? Please provide a basis of design that includes the amount of lime sludge produced at average day demand and the available days of storage at this production rate. These parameters will need to be used towards developing the residuals management plan. Finally, an acceptable residuals management plan is needed for us to consider a deviation from the 10-State Standards guidelines.
4. An effluent sampling point needs to be provided for decant water.

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Friday, June 20, 2014 4:07 PM
To: Johnson, Mark
Cc: Poy, Thomas; Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shoven, Heather; Murphy, Thomas
Subject: Briefing -- Flint River for drinking water, Michigan
Attachments: Flint River Test Run Phase2 5 July 2013.pdf; GENESEE-2014-05-30.pdf; GENESEE-2014-05-27.pdf; Flint04-2014MOR.pdf

Mark—as we discussed earlier this week, below is a briefing containing the information we discussed regarding the Flint, Michigan water supply. I am out of the office this coming week; if you have questions, please contact Tom Poy, Ground Water and Drinking Water Branch Chief.

Thank you for your time!

Jennifer

Drinking Water in Flint, Michigan

ISSUE: Flint began pumping/treating/distributing Flint River water as their drinking water source on April 25, 2014, and beginning in mid-May, there have been numerous complaints to the Region 5 Ground Water and Drinking Water Branch regarding the drinking water, including rotten egg smell, swamp water smell, people developing rashes. The Region immediately contacted and involved the Drinking Water program at the Michigan Dept of Environmental Quality (MDEQ).

BACKGROUND: Flint has been purchasing finished drinking water from Detroit for decades (source water is Lake Huron). It has been delivered by a large single pipeline from Detroit. In the late 1980's, the State drinking water staff requested that Flint renovate their old surface water treatment plant to meet the State's redundancy requirements, in case the single pipeline from Detroit was unable to transmit finished drinking water. Flint would treat Flint River water periodically throughout the year, to verify that the water treatment plant (WTP) was able to treat Flint River water that met Safe Drinking Water Act (SDWA) standards.

Over the past 15 years or so, Detroit has seen a decrease in its City population, and an increase in poverty/low income residents. Detroit currently has an Emergency Manager due to poor financial situation. (As an aside, last year the City of Highland Park told Detroit it was unable to pay its water/sewer bills, and currently has an Emergency Manager. Highland Park was unable to obtain funding to retrofit its surface water treatment plant, so Detroit is providing water/sewer currently to Highland Park for free.) In order to continue to provide adequately treated water that meets SDWA Health standards, the suburbs have been subsidizing the lower income residents for years. Consequently, communities like Flint have decided to find an alternate source of drinking water.

A regional water authority was formed in 2010, the Karegnondi Water Authority (KWA), which will serve water in mid-Michigan and the Thumb areas. Members of the KWA include Flint, Lapeer; and Genesee, Lapeer and Sanilac Counties. The KWA is currently constructing the Karegnondi pipeline to bring raw water from Lake Huron. It will be completed in about 2 years. Flint has an Emergency Manager now, and I think on paper, it looked like a savings to pump and treat Flint River water for the 2-year interim period prior to connecting to the Karegnondi pipeline, than to continue to pay

Detroit prices for finished drinking water. MDEQ has worked long and hard with the City of Flint and water operators to get the WTP ready to treat Flint River water for the next few years. Complete operation/treatment began April 25, 2014.

In mid-May, Region 5 Ground Water and Drinking Water Branch began receiving calls from Flint citizens regarding the quality of the Flint drinking water. Complaints include rotten egg smell, swamp water smell, people developing rashes. I talked with Richard Benzie, the Community Drinking Water Unit Chief, at MDEQ about any possible chemical releases into the Flint River, and neither he nor Mike Prysby, the Lansing District engineer for Flint, have heard of anything such as this. The normal procedure of chemical releases is that Mike Prysby and Richard would be alerted/notified through the Pollution Emergency Alert System (PEAS), and that hasn't happened.

Mike Prysby has been working quite closely with the Operator-in-Charge at the Flint Water Treatment plant to prepare the WTP and operators to treat the Flint River water. Attached are several analytical results: July 2013 Test Run of Phase 2/5 contaminants conducted on the Flint River, sampled in July 2013; no exceedances are noted; detects of barium and selenium. The April 2014 Monthly Operation Report (MOR) which includes bacteriological analyses, was finalized in mid-May (includes only April 25-30 operation activity) with the following test results (sampled in May 2014), that were provided last week by Steve Busch, the MDEQ Supervising District Engineer: Total Organic Carbon (TOC), Metals, Volatile Organic Carbon (VOC), Synthetic Organic Contaminants (SOC) (all 3 categories), and partial chemistry (which includes nitrates). As the WTP only operated for the last 6 days in April, the MOR results provide limited information. The Bacteriological Portion of the May Operating Period were due 6/10, but the operational monitoring won't be reported until 6/30.

FINDINGS: So, bottom line—yes, the raw water is a different quality and more variable than Lake Huron raw water that Detroit is using. The Flint River is not as high a quality water as Lake Huron, but they are pretreating with ozone, conducting softening to reduce hardness and organic precursors, and are working with chlorine application. And, the Flint River is an interim source of raw water until the Karogonondi pipeline is constructed to bring raw Lake Huron water to Flint for treatment.

When you look at the July 2013 Test Run analyses attached, note:

The sample was taken at the Filter Effluent—normally it would be taken at the plant tap, but they were running Flint River water through most of the plant last summer to test treatment, and the filters were the last stop before the clear well/plant tap which were filled with Detroit water they were serving last year. Note: Trihalomethanes (TTHM) are detected, but no exceedances. Detects could be due to: Softening had not been introduced to the treatment process last summer which would reduce the hardness and also remove some of the organic precursor that would add to TTHM levels. Softening is being conducted now in the treatment process. Last summer, chlorine was added in mid-treatment which also could have added to the TTHM level. Now, chlorine is added just before the filters. Also, since it's summer surface water, there will be more run-off, thus more precursor in the raw water. Mike Prysby, the MDEQ District Engineer, believes that today's operation of the plant and quality of drinking water produced is much better than the test runs done over the past year, due to the adjusting of the treatment, such as the softening process and the chlorine application.

Mike received Flint's first Monthly Operation Report (MOR) for the timeframe of April 25-30. Ozone pretreatment is provided to the raw water, and there is ozone destruction at the end of the pretreatment. The Filter Effluent has never been over 0.3 NTU, the ave range is 0.12-0.21 NTU. The chlorine residual at the plant tap is 0.9-1.0 free chlorine. The distribution chlorine residual ranged from 0.7-1.0 of free chlorine, which is acceptable. Bacti samples are pulled every 3-4 hours starting on April 25-30, and all were clear.

CONCLUSION: The analyses show some detects of regulated contaminants, but no exceedances. Thus, we have no report on any regulated contaminant that might be causing rashes, and the complaints we're hearing. I did ask Steve Busch at MDEQ, if there was a possibility of the existence of cyanotoxins from algae on the Flint River. Steve has worked with systems in Southeast Michigan and with Ohio EPA on algae issues, and he didn't think the conditions of the Flint River would support an algae bloom that would cause cyanotoxins to be present.

We would like to know if ATSDR would be interested in looking into this situation, to determine if there are other unregulated contaminants causing complaints of poor water quality.

Mike Prysby: 517-290-8817; prysbym@michigan.gov.

Steve Busch: 517-643-2314; buschs@michigan.gov

Jennifer

Jennifer Kurtz Crooks

Michigan Program Manager/Set-Aside Coordinator

Ground Water and Drinking Water Branch

U.S. EPA, Region 5

77 West Jackson Blvd., WG-15J

Chicago, Illinois 60604

(312) 886-0244

(312) 582-5853 (fax)

crooks.jennifer@epa.gov

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LE83917

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: FILTER EFF
Collector: Public Water Supply Operator
Date Collected: 07/18/2013 07:30
Date Received: 07/18/2013 12:23
Purpose: Routine Monitoring

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	07/19/2013	0.006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	07/19/2013	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	07/19/2013	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	07/19/2013	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	07/19/2013	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	72	07/18/2013	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	07/19/2013	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	07/26/2013	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.13	07/18/2013	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	168	07/18/2013	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	07/18/2013	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	07/19/2013	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	07/19/2013	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	07/19/2013	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	0.5	07/18/2013	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	07/18/2013	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not Detected	07/19/2013	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	13	07/18/2013	5		SM 3500 NaB	7440-23-5
Sulfate	12	07/18/2013	10		SM 4500 SO ₄ E	14808-79-8
Thallium	Not detected	07/19/2013	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by HPLC

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

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

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

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Carbamates by HPLC

3 Hydroxycarbofuran	Not Detected	07/23/2013	0.001		EPA 531.2	16656-82-6
Aldicarb	Not Detected	07/23/2013	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	07/23/2013	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	07/23/2013	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	07/23/2013	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	07/23/2013	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	07/23/2013	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	07/23/2013	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	07/23/2013	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	07/23/2013	0.001		EPA 531.2	114-26-1

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	07/24/2013	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	07/24/2013	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	07/24/2013	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	07/24/2013	0.004		EPA 616.4	50594-66-6
Antazon	Not Detected	07/24/2013	0.002		EPA 515.4	25057-89-0
Carbamba	Not Detected	07/24/2013	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	07/24/2013	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	07/24/2013	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	07/24/2013	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	07/24/2013	0.001		EPA 515.4	1861-32-1

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	07/23/2013	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	07/23/2013	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	07/23/2013	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	07/23/2013	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	07/23/2013	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	07/23/2013	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	07/23/2013	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	0.0005	07/23/2013	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	07/23/2013	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	07/23/2013	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	07/23/2013	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	07/23/2013	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	07/23/2013	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	07/23/2013	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	07/23/2013	0.0001	0.001	EPA 525.2	118-74-1

CAS#: Chemical Abstract Service Registry Number

MCL: Maximum Contaminant Level

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RL: Reporting Limit

mg/L: milligrams / Liter (ppm)

ppm: parts per million

MPN: Most Probable Number

CFU: Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian

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Sample Number

LE83917



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Pesticides Analysis by GC/MS

Hexachlorocyclohexane (alpha-BHC)	Not Detected	07/23/2013	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	07/23/2013	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	07/23/2013	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	07/23/2013	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	07/23/2013	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	07/23/2013	0.0001	0.04	EPA 525.2	72-43-6
Metolachlor	Not Detected	07/23/2013	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	07/23/2013	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	07/23/2013	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	07/23/2013	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	07/23/2013	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	07/23/2013	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	07/23/2013	0.001	0.003	EPA 525.2	8001-35-2

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	07/25/2013	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	07/25/2013	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	07/25/2013	0.0005		EPA 524.2	663-58-6
1,1,1 Trichloroethane	Not Detected	07/25/2013	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	07/25/2013	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	07/25/2013	0.0005		EPA 524.2	79-34-6
1,2 Dichlorobenzene	Not Detected	07/25/2013	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	07/25/2013	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	07/25/2013	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	96-63-6
1,3 Dichlorobenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	07/25/2013	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	07/25/2013	0.0005	0.075	EPA 524.2	106-46-7

CAS#: Chemical Abstract Service Registry Number

MCL: Maximum Contaminant Level

AL: Action Level

RL: Reporting Limit

mg/L: milligrams / Liter (ppm)

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Laboratory Contacts

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	07/25/2013	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	07/25/2013	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.029	07/25/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0008	07/25/2013	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	07/25/2013	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	07/25/2013	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.014	07/25/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	07/25/2013	0.0005		EPA 524.2	75-00-3
Chloroform	0.030	07/25/2013	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	07/25/2013	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	07/25/2013	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	07/25/2013	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	07/25/2013	0.0005		EPA 524.2	74-95-3
Chlorodifluoromethane	Not Detected	07/25/2013	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	07/25/2013	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	07/25/2013	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	07/25/2013	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	07/25/2013	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	07/25/2013	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	07/25/2013	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	07/25/2013	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	07/25/2013	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	07/25/2013	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	07/25/2013	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	07/25/2013	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	07/25/2013	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	07/25/2013	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	07/25/2013	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	07/25/2013	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	127-18-4

CAS#: Chemical Abstract Service Registry Number
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ppm: parts per million
MPN: Most Probable Number
CFU: Colony Forming Unit

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE83917



TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Volatile Organic Compounds

Tetrahydrofuran	Not Detected	07/25/2013	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	07/25/2013	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.074	07/25/2013	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	07/25/2013	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	07/25/2013	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	07/25/2013	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	07/25/2013	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	07/25/2013	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. This sample contained acetone at an approximate concentration of 20 ppb.

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Sample Number
LF19430

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT -WATER PLANT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	LAB TAP
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/22/2014 08:30
Sample Point:	PLANT LAB TAP	Date Received:	05/22/2014 13:19
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	05/23/2014	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	05/23/2014	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	05/23/2014	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	05/23/2014	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	05/23/2014	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	79	05/22/2014	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	05/23/2014	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	05/27/2014	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.16	05/22/2014	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	209	05/22/2014	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	05/22/2014	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	05/23/2014	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	05/23/2014	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	05/23/2014	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	0.4	05/22/2014	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	05/22/2014	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not Detected	05/23/2014	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	15	05/22/2014	5		SM 3500 NaB	7440-23-5
Sulfate	25	05/22/2014	10		SM 4500 SO ₄ E	14808-79-8
Thallium	Not detected	05/23/2014	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by HPLC

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Sample Number**LF19430**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Carbamates by HPLC

3-Hydroxycarbofuran	Not Detected	05/27/2014	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	05/27/2014	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	05/27/2014	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	05/27/2014	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	05/27/2014	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	05/27/2014	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	05/27/2014	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	05/27/2014	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	05/27/2014	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	05/27/2014	0.001		EPA 531.2	114-26-1

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	05/23/2014	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	05/23/2014	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	05/23/2014	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	05/23/2014	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	05/23/2014	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	05/23/2014	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	05/23/2014	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	05/23/2014	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	05/23/2014	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	05/23/2014	0.001		EPA 515.4	1861-32-1

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	05/23/2014	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	05/23/2014	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	05/23/2014	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	05/23/2014	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	05/23/2014	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	05/23/2014	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	05/23/2014	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	05/23/2014	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	05/23/2014	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	05/23/2014	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	05/23/2014	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	05/23/2014	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	05/23/2014	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	05/23/2014	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	05/23/2014	0.0001	0.001	EPA 525.2	118-74-1

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Sample Number**LF19430**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclohexane (alpha-BHC)	Not Detected	05/23/2014	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	05/23/2014	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	05/23/2014	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	05/23/2014	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	05/23/2014	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	05/23/2014	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	05/23/2014	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	05/23/2014	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	05/23/2014	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	05/23/2014	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	05/23/2014	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	05/23/2014	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	05/23/2014	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	05/27/2014	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	05/27/2014	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	05/27/2014	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	05/27/2014	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	05/27/2014	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	05/27/2014	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	05/27/2014	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	05/27/2014	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	05/27/2014	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	05/27/2014	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	05/27/2014	0.0005	0.075	EPA 524.2	106-46-7

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Sample Number**LF19430**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	05/27/2014	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	05/27/2014	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.020	05/27/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0010	05/27/2014	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	05/27/2014	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	05/27/2014	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.013	05/27/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	05/27/2014	0.0005		EPA 524.2	75-00-3
Chloroform	0.022	05/27/2014	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	05/27/2014	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	05/27/2014	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	05/27/2014	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	05/27/2014	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	05/27/2014	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	05/27/2014	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	05/27/2014	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	05/27/2014	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	05/27/2014	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	05/27/2014	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	05/27/2014	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	05/27/2014	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	05/27/2014	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	05/27/2014	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	05/27/2014	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	05/27/2014	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	05/27/2014	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	05/27/2014	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	05/27/2014	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	05/27/2014	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	05/27/2014	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	05/27/2014	0.005		EPA 524.2	109-99-9

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Sample Number

LF19430

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Toluene	Not Detected	05/27/2014	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.056	05/27/2014	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	05/27/2014	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	05/27/2014	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	05/27/2014	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	05/27/2014	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	05/27/2014	0.0004	0.002	EPA 524.2	75-01-4

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

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

Genesee County Health Dept.

630 South Saginaw

Flint, MI 48502-1540

810 257-3603

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AL : Action Level
RL : Reporting Limit

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562



Sample Number
LF19431

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT - WATER PLANT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	PS4
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/22/2014 08:30
Sample Point:	SINK	Date Received:	05/22/2014 13:20
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	4.57	05/22/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF19432

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT/ WATER PLANT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	RAW
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/22/2014 08:30
Sample Point:	SINK	Date Received:	05/22/2014 13:20
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	10.3	05/22/2014	0.5		SM 5310C	TOC-00-C

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

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

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AL : Action Level
RL : Reporting Limit

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

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

[illegible]

**Fluoridation &
Chlorination**

 City of Flint Water Treatment Plant
WSSN: 2310

April 2014

Page 3

Date	Fluoride Applied as F- mg/L	Fluoride Analysis (mg/L)			Chlorine Application (mg/L)			Chlorine Residual (mg/L)					
					Intermediate Chlorine	Post Chlorine	Total Chlorine	Filtered		3 MG Well		Tap	
		Raw	Tap	Dist.				Free	Total	Free	Total	Free	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25	0	0.14	0.59		3.5	0	3.5	1.8	2.1			0.8	1.0
26	0	0.14	0.53		3.5	0	3.5	1.7	1.9			0.9	1.1
27	0	0.13	0.53		3.6	0	3.6	1.7	1.9	1.5	1.8	1.0	1.1
28	0	0.13	0.19		3.7	0	3.7	1.7	1.9	1.4	1.8	0.9	1.0
29	0	0.15	0.58	0.43	3.7	0	3.7	n/a	n/a	n/a	n/a	0.9	1.1
30	0	0.15	0.62		3.5	0	3.5	1.7	2.0	1.5	1.8	1.0	1.1
Avg.	0	0.14	0.51	0.43	3.6	0	3.6	1.7	2.0	1.5	1.8	0.9	1.1
Max.	0	0.15	0.62	0.43	3.7	0	3.7	1.8	2.1	1.5	1.8	1.0	1.1
Min.	0	0.13	0.19	0.43	3.5	0	3.5	1.7	1.9	1.4	1.8	0.8	1.0

Chemical Analyses

City of Flint Water Treatment Plant
WSSN: 2310

April 2014

Page 4

Date	pH (S.U.)		Total Hardness as CaCO ₃ (mg/L)		Total Alkalinity as CaCO ₃ (mg/L)		Non-Carbonate Hardness as CaCO ₃ (mg/L)		Calcium as Ca ²⁺ (mg/L)		Magnesium as Mg ²⁺ (mg/L)		Chloride as Cl ⁻ (mg/L)	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
1														
2														
3														
4														
5														
6														
7														
8														
9														
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11														
12														
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14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25		7.39		96		75		21		29.7		5.3		
26	8.31	7.28	255	98	200	73	55	25	77.9	29.7	13.6	5.8	48	24
27	8.34	7.32	249	98	199	70	50	28	75.4	30.5	14.6	5.8	42	32
28	8.39	8.46	247	92	205	60	42	32	82.6	46.5	9.8	8.3	43	68
29	8.46	7.35	230	98	190	70	40	28	76.2	30.5	9.7	5.3		
30	8.41	7.30	248	98	208	73	40	25	72.1	29.7	17.5	5.8	45	17
Avg.	8.38	7.52	246	97	200	70	45	27	76.8	32.8	13.0	6.1	45	35
Max.	8.46	8.46	255	98	208	75	55	32	82.6	46.5	17.5	8.3	48	68
Min.	8.31	7.28	230	92	190	60	40	21	72.1	29.7	9.7	5.3	42	17

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

April 2014

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Date	Total Coliform						Standard Plate Count		Wind Direction	Temp. C	Color		Odor	
	Raw (Colilert MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap			Raw	Raw	Tap	Raw
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25	1		12	0	1	0		< 2		11.0				
26	1		12	0	1	0	> 1476	< 2		11.4				
27	1		12	0	1	0	142	< 2		11.1				
28	1		8	0	1	0	532	< 2		11.5				
29	1		0	0	1	0		< 2		12.1				
30	1		4	0	1	0	1246	< 2		13.5				
Avg.							n/a	< 2		11.8				
Max.							> 1476	< 2		13.5				
Min.							142	< 2		11.0				

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
WSSN: 2310

April 2014

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Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WR	
1											0
2											0
3											0
4											0
5											0
6											0
7											0
8											0
9											0
10											0
11											0
12											0
13											0
14											0
15											0
16											0
17											0
18											0
19											0
20											0
21											0
22											0
23											0
24											0
25											0
26											0
27											0
28											0
29	1.0	0.8	1.0	0.7	0.8	0.8	1.1	0.8	0.7	0.9	10
30											0
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	115
Total # of routine distribution samples required	100

Distribution Disinfectant Residual Summary

Percent samples with a detectable disinfectant residual	100
Average disinfectant residual this month	0.9

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0

Positive Distribution Samples

Date	Monitoring Station	Date	Repeat Monitoring Stations	Residual	Positive or Negative

April 2014

[illegible]

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, September 11, 2014 11:59 AM
To: Mike Glasgow; 'bwright@cityofflint.com'
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Bromate Monitoring
Attachments: 2014 Flint MS startup.doc

Attached is a revised monitoring schedule for 2014 which now includes monthly monitoring for bromate. This is required for systems that use ozone. Your 1st sample needs to be collected by the end of September 2014 and monthly thereafter. Follow the link in the schedule to find a certified lab as the State Drinking Water lab no longer runs tests for bromate. Depending on results, monitoring may be reduced to quarterly after 1 year.

let us know if you have any questions.

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

2014 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

Collect samples early in the monitoring period. This schedule reflects your expected routine monitoring and is subject to change. To receive credit for monitoring, include the **WSSN**, **Site Code**, and **County** on your request for analysis form. Collect Bacteriological and Automated Partial Chemistry samples close to the shipping time and send overnight delivery. Send all sample results to your Department of Environmental Quality (DEQ) district office unless you use the DEQ laboratory. Test codes, sample units, and costs are listed to help you complete the DEQ laboratory form. Prices are subject to change without notice. The DEQ laboratory is closed on state holidays.

Location: Plant Tap

Collect these samples at the entry point to the distribution system (after treatment, if applicable.)

Sample Type	# Samples/ Frequency	Collect Before	Site Code	Fee	Unit Number	Test Code
Automated Partial Chemistry	This DEQ lab scan includes nitrate, nitrite, fluoride, and sodium whose monitoring frequency requirements differ from one another. Before requesting analyses from a laboratory other than the DEQ laboratory, check with your DEQ district staff for the specific monitoring requirements.					
	1/3 months	Quarterly	TP001	\$18.00	32	R
Volatile Organic Compounds	1/3 months	Quarterly	TP001	\$100.00	36VO	CXVO
Complete Metals	1/36 months	09/30/2014	TP001	\$102.00	36ME	CMET2
Arsenic	1/3 months	Quarterly	TP001	\$18.00	36ME	CAS
Cyanide	1/3 months	Quarterly	TP001	\$25.00	36CNa	CCN
SOC – Pesticides	1/3 months	Quarterly	TP001	\$125.00	36PT	CXPT
SOC – Herbicides	1/3 months	Quarterly	TP001	\$120.00	36HB	CXHB
SOC – Carbamates	1/3 months	Quarterly	TP001	\$120.00	36LP	CXLP
Bromate	1/1 month	Monthly	TP001	Not performed at the DEQ Laboratory. A list of certified labs is at www.michigan.gov/DEQ . Select Water, Drinking Water, Community Water Supply, then Certified Labs under Programs and Activities.		
Gross Alpha (Radiological)	1/3 months	Quarterly	TP001			
Radium 226 & Radium 228	1/3 months	Quarterly	TP001			
Water Quality Parameters	Bi-weekly	Every 2 Weeks	TP001	Various	Various	Various
Total Organic Carbon (TOC)	Pair/Monthly	Monthly	TP001	\$35.00	36TO	CTOC
	Monitor for TOC in the source water before any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as "paired samples." Collect the treated water sample not later than the point of combined filter effluent turbidity monitoring and representative of treated water.					
Expanded SOCs						
Dalapon & Haloacetic Acids	1/12 months	Between 04/01 and 09/30/2014	TP001	\$130.00	36HA	CXHA
Diquate	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36DQ	CXDQ
Endothall	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36EN	CXEN
EDB & DBCP	1/12 months	Between 04/01 and 09/30/2014	TP001	\$70.00	36VO	CXEV

2014 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

Collect samples early in the monitoring period. This schedule reflects your expected routine monitoring and is subject to change. To receive credit for monitoring, include the **WSSN, Site Code**, and **County** on your request for analysis form. Collect Bacteriological and Automated Partial Chemistry samples close to the shipping time and send overnight delivery. Send all sample results to your Department of Environmental Quality (DEQ) district office unless you use the DEQ laboratory. Test codes, sample units, and costs are listed to help you complete the DEQ laboratory form. Prices are subject to change without notice. The DEQ laboratory is closed on state holidays.

Location: **Distribution System**

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	100/6 months	Between 07/01 and 12/31/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$130.00	36HA	CXHA

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Tuesday, October 06, 2015 5:50 PM
To: DEQ-ODWMA-Cadillac; DEQ-ODWMA-Community Drinking Water; DEQ-ODWMA-Environmental Health; DEQ-ODWMA-Executive; DEQ-ODWMA-Gaylord; DEQ-ODWMA-Grand Rapids; DEQ-ODWMA-Jackson; DEQ-ODWMA-Kalamazoo; DEQ-ODWMA-Lansing District; DEQ-ODWMA-Rev-Loan; DEQ-ODWMA-Saginaw Bay; DEQ-ODWMA-SEMI; DEQ-ODWMA-UP
Cc: Tetzlaff, Katherine (DEQ); Gasper, Kirsten (DEQ)
Subject: Brown Bag - Thursday, 10-8-15 @ 11 AM

If you haven't already been informed by your supervisor, we are planning a conference call with the ODWMA district staff to be held in the ConCon Conference room at 11 AM on October 8th to provide an update and explain what has been happening and what we are doing in response to concerns about increased blood lead levels and possible lead exposure in the city of Flint. We realize that many of you may be receiving questions about this matter from your contacts at water systems in your district or at local health departments.

If you work in Constitution Hall, you are invited to the conference room. If you will be in one of the district offices or at a remote site, you may call in to the conference number that was provided to all ODWMA supervisors, but hopefully you will do so as a group.

I will try to let Liane and Steve do most of the talking so we can get out of there in an hour or two.

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, March 31, 2015 3:31 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Cc: Poy, Thomas; Bair, Rita; Damato, Nicholas; Murphy, Thomas; Shoven, Heather; Kuefler, Janet; Deltoral, Miguel
Subject: Call with EPA-Cincinnati, Office of Research and Development

Mike—below are the notes from the call we had last week regarding Legionella, as we discussed. You also mentioned that I should remind you to:

1. check with Mike Glasgow at Flint to ask about their flushing strategy; what types of flushing they are conducting; and
2. that you will send me the March MOR when you receive it in April. (Kris Donaldson from Warren office sent me the March 2014 MOR for Flint w/Detroit water.)

Both of these items above were discussed by Darren Lytle; that these documents will provide him basic data about the Flint water system.

Thank you!

Jennifer

Summary:

Last Thursday, March 26, we talked with Darren Lytle, Acting Chief of the Treatment Technology Evaluation Branch at EPA-Cincinnati, Office of Research and Development. Also in attendance was Simoni Triantafyllidou, a post-doctoral fellow working with Darren. Tom Poy, Nick Damato, Janet Kuefler, Miguel, and Jennifer were also in attendance.

Tom Poy summarized for Darren and Simoni what has occurred with the Flint drinking water since April 2014 when the change over from Detroit to Flint River water occurred, including the violations Flint has incurred since then. Miguel said that we don't know if Flint has a lead problem at this time. Due to findings by Genessee County Health Dept. that there has been an increase in the incidence of Legionella since April 2014, Genessee CHD has FOIA'd the City of Flint for operational data.

Darren talked about several treatments they have done for Legionella in 2 hospitals. The first treatment used copper/silver ions for disinfection. They did sampling at 10 locations, took water quality parameters and took microbiological samples. But they shut down the treatment due to staining of toilets on the cold water side. They did turn the treatment back on, only on the hot water side. The second treatment is a monochloramine system in the hot water feed, but the secondary effects are nitrification.

Darren said they have been doing studies for Homeland Security, collecting sediments at the bottom of storage tanks. He is finding high concentrations of Legionella in the bottom of the tanks.

Darren said anytime there is a treatment change, issues arise with the drinking water quality. Thus, what does this do to the transport of organisms like Legionella? Does it cause organisms to desorb and go into solution? The changes in water chemistry change these organisms electrostatically, and the biofilms with the distribution system pipes are disrupted and de-stabilize. Thus, different contaminants can be released. So maybe this isn't happening in people's homes; but it is happening in the distribution system pipes.

Darren thought that the incidence of Legionella must be fairly extensive for the CHD to notice and study.

We talked about the pathogen, Legionella. Simoni said that Legionella is everywhere; it is a group of opportunistic pathogens; meaning that it looks for high risk/immunocompromised hosts to infect. It may infect others but not show signs of disease because their immune system is working properly. Simoni was interested in knowing where are these cases of Legionella occurring? The background information/data is important in a study of the incidence of Legionella. Jen said she would gather data from past use of Detroit water (March 2014 monthly operation report-MOR), and recent MORs from use of Flint River water, and TTHM levels since April 2014. Tom Poy said that the Dept of Community Health is communicating with the Genessee CHD regarding their findings on Legionella.

Miguel said that extensive flushing is going on in Flint to address stagnant water that fosters bacte problems and TTHM development. But, stirring up the distribution system lines with flushing is stirring up the sediment in the pipes, and then causes a large chlorine demand, thus decreasing the chlorine residual which could promote the growth of bacteria, such as Legionella. Chlorine residual will come back gradually, though. Jen said she would check in with the State to find out the details of Flint's flushing program; is it unidirectional for example?

Darren asked, How can we help? He offered to conduct sampling and analyses for Legionella when it is needed. Tom Poy said the State is currently figuring out a communication-with-the-public plan. Mike Wright is the HQ-ORD DDBP expert and he is helping with the TTHM health effects issue. Tom Poy said that we are laying a foundation now with resources for when the State goes public with the issue of Legionella. Darren said that the labs are set-up now ready for Legionella sampling and analyses. Mark Rodgers is the Chief of the Microbial Contamination Branch at EPA-Cincinnati, ORD.

Darren is doing a RARE project in Region 3 on Legionella. EPA could work on the DNA to determine if the Legionella infecting people is from the distribution system. Type 1 Legionella causes disease, but other forms of Legionella do not cause disease. But Darren said, we must identify the source of the Legionella first.

Miguel said that we must look at the overall picture, i.e. is the system causing this increased incidence of Legionella disease? Darren said that first, we must find the source—is Legionella there? If Legionella is present, in the tanks/pipes, then disturbance of changing the water quality and flushing, could cause it to proliferate.

END

Rennaker, Joanne (DEQ)

From: Scherbarth, John (AG)
Sent: Monday, March 16, 2015 11:23 AM
To: Busch, Stephen (DEQ)
Subject: CIT FLINT WATER SUPPLY SYSTEM

Who controls the water rates in Flint/Genesee County?

Thanks for providing me an update on the situation involving the Flint water supply system.

John C. Scherbarth
Environment, Natural Resources, and Agriculture Division
Michigan Department of Attorney General
P.O. Box 30755
Lansing, MI 48909

Telephone: 517-373-7540
Fax: 517-241-3473

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, September 09, 2014 10:00 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Cc: Poy, Thomas; Benzie, Richard (DEQ)
Subject: Citizen complaint call from man who lives in Flint, MI
Attachments: BoilWater09022014.pdf

Hi, Steve and Mike. We heard about the boil water advisory for Flint for 9/3 last week. Tom Poy also had several calls from Lathan Jefferson yesterday, re-iterating his past calls/claims that the Flint water is unfit to drink.

Any update as to the source of positive bacti? I heard no E.coli, which is good.

Thank you for your time

From: Murphy, Thomas
Sent: Monday, September 08, 2014 1:48 PM
To: Poy, Thomas
Cc: Shoven, Heather; Crooks, Jennifer
Subject: Citizen complaint call from man who lives in Flint, MI

I checked Flint's website and found the attached 9/3/2014 Boil Water Notice (affected area expanded on 9/5/2014) for an apparent monthly total coliform bacteria MCL violation.

LOCALIZED DRINKING WATER WARNING
Coliform bacteria detected in localized area of Flint water system
BOIL YOUR WATER BEFORE USING

Our water system detected the presence of coliform bacteria in the water supply on September 3, 2014. We routinely monitor for the presence of drinking water contaminants. We took routine samples for coliform bacteria during on September 2, 2014 from all sampling locations throughout the city. The location near Flushing Road and Chevrolet Avenue showed the presence of coliform bacteria. We took three repeat samples at this location and at adjacent locations on September 3 and again on September 4, 2014. Two of the three samples on the 3rd showed the presence of total coliform bacteria and three of the three samples collected on the 4th in this same area showed the presence of total coliform bacteria. On September 5th two of three sample showed presence of total coliform bacteria. **Updated area of ML King and Pasadena.** On September 4th one sample showed presence of total coliform bacteria. On September 5th two of the three samples at adjacent locations showed presence of total coliform bacteria. All other monitoring locations in the City continue to show no presence of Coliform bacteria.

What should I do?

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and preparing food. Boiling kills bacteria and other organisms in the water. **Continue using boiled or bottled water until further notice.** This boil notice is limited to the area bordered by Dayton Street (north), DuPont Street (east), Flint River (south), and LaVelle Road to Flint River (west).

The current boil water notice is being expanded to the north. This boil water notice is being expanded to the area bordered by Stewart Ave. (north), Saginaw (east), Hamilton Ave (south), and Clio Rd (west).

If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from your health care providers about drinking this water.

What does this mean?

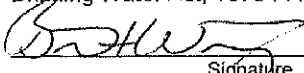
Total coliform bacteria are generally not harmful themselves. *Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.*

Usually, coliforms are a sign that there could be a problem with the treatment or distribution system (pipes). Whenever we detect coliform bacteria in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing. If we had, we would have notified you immediately. However, we are still finding coliforms in the drinking water.

CERTIFICATION:

2310
WSSN: «WSSN»

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.



Signature

PHANT SUPERVISOR

Title

9/6/2014

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DNRE.

What happened? What is being done?

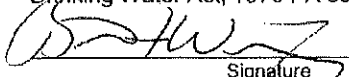
We are still detecting coliform bacteria. We will inform you when our sampling shows that no bacteria are detected. We are flushing the system and increasing the chlorine residual within the affected area. We anticipate resolving the problem within the next two to three days. In the meantime, please continue using boiled or bottled water until we notify you otherwise.

If you have questions, you may contact Mr. Brent Wright of the City of Flint at 810-787-6537, bwright@cityofflint.com, 4500 North Dort Highway, Flint MI. 48505 or Daughtry Johnson, Utilities Administrator (810) 766-7135, ext. 2602. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

CERTIFICATION:

WSSN: «WSSN» ²³¹⁰

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.



Signature

PLANT SUPERVISOR

Title

9/6/2014

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DNRE.

Rennaker, Joanne (DEQ)

From: Shaler, Karen (DEQ)
Sent: Friday, October 30, 2015 5:28 PM
To: mglasgow@cityofflint.com
Cc: bwright@cityofflint.com; hcroft@cityofflint.com; Natasha Henderson; lytle.darren@epa.gov; SFMatta@lan-inc.com; jwgreen@lan-inc.com; jhenry@gchd.us; Dykema, Linda D. (DHHS); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Rennaker, Joanne (DEQ)
Subject: City of Flint - Corrosion Control Treatment Operation
Attachments: Flint CCT Operation Letter 10-30-15.pdf

Mr. Mike Glasgow,

Please see the attached letter from Michael F. Prysby, P.E., District Engineer, Office of Drinking Water and Municipal Assistance, Michigan Department of Environmental Quality. The original will be sent via U.S. Mail on Monday, November 2, 2015.

Karen Shaler, Management Assistant to
Chief Deputy Director Jim Sygo
Michigan Department of Environmental Quality
Constitution Hall, 6th Floor South
Phone: 517-284-6709
Fax: 517-241-7401
shalerk@michigan.gov



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

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

Dear Mr. Glasgow:

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

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

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

Corrosion Control Treatment and Operation

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

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

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

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

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

Enhanced Water Quality Parameter Monitoring

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

- Turbidity (NTU)
- 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)

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

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

Corrosion Control Treatment Test Loops

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

Lead Service Line Verification Sampling

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

Mr. Mike Glasgow

3

October 30, 2015

Customer Household Exposure Assessment

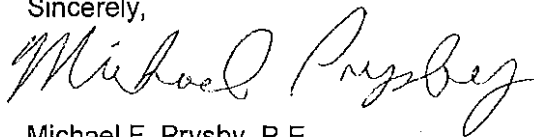
The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will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

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

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

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

Sincerely,



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

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

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Monday, April 06, 2015 11:14 AM
To: Prysby, Mike (DEQ)
Cc: hcroft@cityofflint.com; Busch, Stephen (DEQ)
Subject: City of Flint - WTP Conversion to GAC.

Hi Mike,

As per our phone conversation, LAN has been working with the City to implement the recommendation from Veolia with regard to the conversion of the 12 filters at the plant by replacing the 18" Anthracite with new GAC Media.

Due to the time frame limitation, We have discussed with the City that sole sourcing the GAC purchase and installation may be the only chance for us to accomplish the work on time as the system will need to be in place by early July in order to give the City 5-7 weeks of treatment time with the new media before the August sampling.

The City is looking for us to provide a turn-key delivery method in order to insure that we can acquire a vendor while performing the design and going thru your office for permitting.

Let us know if you agree with the approach or if you recommend a different method.

Your prompt response is greatly appreciated.

Samir F. Matta
Senior Project Manager



**Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY

1311 South Linden Road, Suite B • Flint, MI 48532
2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
D 517.819.2367 C 517.819.2367
www.lan-inc.com • sfmatta@lan-inc.com

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, September 18, 2014 2:08 PM
To: Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Shekter Smith, Liane (DEQ); Willard, Veronica (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Subject: City of Flint BWA follow-up - media inquiry

Mr. Ron Fonger from the Flint Journal called me this morning concerning a follow-up meeting with Flint city council yesterday evening and their summary of the most recent localized BWA (rescinded on 9/9/14). The city agrees that there are underlying problems in the water distribution system; however, the following question was asked.....Why weren't these problems being experienced while we were purchasing water from Detroit? Howard Kroft (City Administrator) responded that the difference in the source water (higher temperature in the Flint River) creates a treated water that is not fully stabilized and reduce chlorine residuals in the distribution system. This problem was exasperated further in the distribution system due to several transmission main valves being closed causing stagnation and ineffective disinfection. Ron asked if I agreed with Mr. Kroft's discussion and if there may be a link between the Flint River source water and the problems recently experienced in the distribution system.

I agreed, in part, that low chlorine residuals (< 0.1 to trace free) and stagnation is ineffective in maintaining adequate disinfection especially in old tuberculated cast-iron piping that is susceptible to bacteriological growth under low chlorine conditions. Stagnation due to closed valves can worsen these conditions; thus, the city needs to optimize system operation to minimize stagnation. Efforts could include; improve turn-over of water within their existing water storage reservoirs on the west side of town, operate their pumping stations in segregated pressure districts instead of re-circulating water. Also, the water storage reservoirs should be inspected and cleaned (removal of any excessive sediment) as needed.

I also agreed with Mr. Kroft's statement that the Flint River is more difficult source to treat than Lake Huron water. Although higher raw water temperature can accelerate the loss of free chlorine in the distribution system, I also added that treated water from the Flint River water likely has an increased chlorine demand due to higher organic content (typically associated with surface water – river sources). Although an adequate free chlorine residual is being distributed from the WTP, the higher chlorine demand will reduce the free residual over time out in the distribution system – which makes it important to optimize distribution system operation.

I also informed Ron that that there has be no further BWAs since last Tuesday nor evidence of contamination in the Flint distribution system. Also, free chlorine residuals have increased in the BWA area based on our most recent discussion with Flint water utility operators.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, September 08, 2014 10:00 AM
To: Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Shekter Smith, Liane (DEQ); Willard, Veronica (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Cc: Philip, Kris (DEQ)
Subject: City of Flint BWA Media Inquiry

Mr. Ron Fonger from the Flint Journal called me this morning concerning the BWA issued for the western portion of the Flint water distribution system. I confirmed Ron's statement that the advisory was issued on Friday Sept 5th for a localized area and was expanded on Sat Sept 6th after samples from an additional routine sampling location tested positive for total coliform bacteria. I confirmed with Ron that none of the samples detected fecal coliform. Ron asked if there was a cause to the most recent contamination. I responded that the city has not identified a specific cause; however, (as I discussed with Ron in the August 20th inquiry - first BWA episode in Flint), potential causes including mainbreaks, unprotected cross connections, unauthorized connections, loss of pressure, etc. will need to be investigated by the city. Low chlorine residuals in this area may also be a contributing factor and could be the result of localized stagnation. The city will need to review distribution system operation, determine whether stagnation is occurring, and modify operation as needed to alleviate this problem. Next, Ron asked if the problem was attributed to the Flint WTP treating water from the Flint River. I informed Ron that treated water from the WTP continues to meet the drinking water standard for total and fecal coliform bacteria and that there have been no detects for these contaminants leaving the WTP. Ron also acknowledged that there has been significant water loss from the water system and asked if that could be a potential cause. I explained to Ron that the loss of water of the magnitude that Flint has been experiencing points to large mainbreaks. Some of these breaks have been repaired; however, the work involved in repairing a broken watermain may or may not introduce contamination into the water system. Critical factors include the extent of the area that may have been taken out of service to complete the repair, how well the trench area is kept clean and de-watered, chlorination at the site, and flushing after the repair. Repair records needs to be reviewed to determine if any major repairs were recently completed in or near the affected area.

Ron's last question pertained to the number of BWAs issued on a state-wide basis. I did not have that information available to Ron; however, upon further discussion with Steve, I will provide Ron with a history of total coliform MCL violations (state-wide basis) as soon as I have the information available.

We do

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

Rennaker, Joanne (DEQ)

From: Thelen, Mary Beth (DEQ)
Sent: Tuesday, March 17, 2015 9:55 AM
To: Hollins, Harvey (GOV)
Cc: Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Thelen, Mary Beth (DEQ); Clayton, Stacie (GOV); Sygo, Jim (DEQ)
Subject: City of Flint Information - Consultants
Importance: High

Good Morning Harvey,

The consultants listed below are working with Flint and are in the best position to recommend a water filter system. The locals should be asked to use their consultants to recommend a technology.

Warren Green with Lockwood, Andrews & Newman, Inc.
630-918-2494

and

Marvin Gnagy with Veolia North America
419-450-2931

Thank you.

Dan Wyant
Director

Mary Beth

Mary Beth Thelen
Management Assistant to Director Dan Wyant
Department of Environmental Quality
Constitution Hall, 6th Floor South
Phone: 517-284-6712 or 284-6700 (new numbers)
Fax: 517-241-7401
Thelenm2@michigan.gov

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, October 29, 2015 10:10 AM
To: nhenderson@cityofflint.com
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: City of Flint Revised Monitoring Schedule October 2015
Attachments: SCAN1146.pdf; 2015 Flint revised schedule-Det.pdf

Good Morning Natasha, it was brought to my attention you asked to be copied on all correspondence regarding the drinking water in the City of Flint, this was after we sent a revised monitoring schedule now that the City is receiving water from Detroit. So, attached is a copy of the letter and revised schedule. I have updated our database to make sure you are included in future correspondence.

thank you,

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 22, 2015

Mr. Brent Wright
City Of Flint – D.P.W
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Revised Drinking Water Monitoring Schedule – 2015
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for remainder of calendar year 2015 outlining the minimum requirements for your public water supply. Your schedule has been revised based on the City's change in source of its drinking water from the treatment of the Flint River utilizing the City's Water Treatment Plant to the Great Lakes Water Authority/Detroit Water and Sewerage Department. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the Department of Environmental Quality Laboratory, you can order bottles by calling 517-335-8184. Be certain of the United States Environmental Protection Agency sampling and analysis method requirements for hold times.

Monthly Operation Report (MOR) Requirements:

The City shall submit MORs as required under Administrative Rule 1502 (R325.11502). Please note required coliform bacteria monitoring results and associated chlorine residual monitoring shall be submitted to the department within the first 10 days following the end of the required monthly monitoring period. In addition, monthly operation reports shall be submitted to the department during the month following the month for which the monthly operation report was prepared.

Mr. Brent Wright

2

October 22, 2015

Disinfection By-Product Sample Siting Plans:

The City of Flint shall continue routine standard monitoring of disinfection by-products, according to your Disinfection & Disinfectants By-Product (DDBP) plan which identifies 8 sites for routine quarterly monitoring.

Lead and Copper Monitoring Requirements and Site Sample Pool

Please note distribution system monitoring for water quality parameters (WQPs) continues at the expanded set of 25 sites per quarter. Lead and copper monitoring in accordance with the requirements of Administrative Rule 710a (R325.10710a) is being required for the 6 month period between January 1, 2016 and June 30, 2016. The City must ensure its sample site pool is large enough to collect the number of lead and copper tap samples required. All sites from which first draw samples are collected shall be selected from the pool of targeted sampling sites.

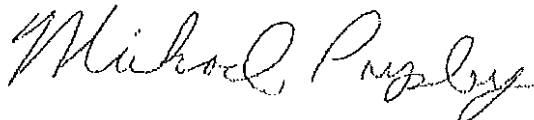
The City shall also conduct additional operational monitoring to demonstrate the effectiveness of corrosion control treatment.

Record Keeping:

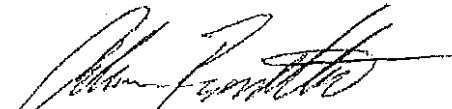
The City shall maintain all monitoring records in accordance with all applicable requirements under the Administrative Rules including Rule 720a (R325.10720a), Rule 1506 (R325.11506), and Rule 1507 (R325.11507).

The Michigan Safe Drinking Water Act requires certain reports to be submitted to this office each year. Please remember that cross connection reports and annual pumpage reports are due by March 31, and the **Consumer Confidence Report** is due by July 1.

Also enclosed is the document "2015 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us using the information below.



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



Adam Rosenthal, EQA
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-284-6644

Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint
Genesee County Health Department

2015 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

Collect samples early in the monitoring period. This schedule reflects your expected routine monitoring and is subject to change. To receive credit for monitoring, include the **WSSN, Site Code, and County** on your request for analysis form. Collect Bacteriological and Automated Partial Chemistry samples close to the shipping time and send overnight delivery. Send all sample results to your Department of Environmental Quality (DEQ) district office unless you use the DEQ laboratory. Test codes, sample units, and costs are listed to help you complete the DEQ laboratory form. Prices are subject to change without notice. The DEQ laboratory is closed on state holidays.

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	If serving chlorinated water, measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$130.00	36HA	CXHA
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	60/6 months	Between 1/1 and 6/30/2016	DIST	\$26.00	36CC	CCUB

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, April 02, 2014 4:12 PM
To: mccormic@dwsd.org
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: City of Flint Water Service

Sue,

I am following up with the city of Flint concerning the issue of reliability during interim operation (Flint River as the primary source) as requested by Liane and Steve. I will discuss this matter with you as soon as possible after my follow-up with Flint.

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

Rennaker, Joanne (DEQ)

From: Johnson, Shannon (DCH)
Sent: Thursday, April 23, 2015 4:15 PM
To: Busch, Stephen (DEQ)
Subject: City of Flint water testing results

Hi Steve,

You had mentioned in our meeting the other week that you would be able to share the water testing spreadsheet. Would it be possible for us to get a copy of that so we can share it with the Genesee Health Department? I know this was part of the information they were looking for.

Thanks for your help.

Best,
Shannon Andrews Johnson, MPH
Infectious Disease Epidemiologist
Michigan Dept. of Health and Human Services
201 Townsend St., CVB 5th Floor
Lansing, MI 48913
Phone: 517-335-8165
Fax: 517-335-8263

Rennaker, Joanne (DEQ)

From: Jennifer Crooks <jcrooks57@gmail.com>
Sent: Friday, September 11, 2015 10:17 AM
To: Poy, Thomas; Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: Clarification

Just to clarify; on our call, I wanted to remind you that Miguel.s report had DEQ cc.d. So if the Legislature or who ever might say you all were cc.d, you can truthfully respond that it was EPA.s request that the report not be sent to the cc.s. Consequently, you all never received the report from Miguel.

Good to talk with you all.

Jennifer

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Thursday, October 01, 2015 9:50 AM
To: Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Busch, Stephen (DEQ)
Subject: Clarification on Lead Rules vs Guidance
Importance: High

Yesterday there was discussion as to why EPA had seemingly contradictory lead levels specified in the Lead and Copper Rule vs the Best Management Practices document. I did a little research and figured out what is going on.

The pertinent section of the Lead and Copper Rule reads as follows:

The treatment technique for the rule requires systems to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of customer taps sampled, the system must undertake a number of additional actions to control corrosion. If the action level for lead is exceeded, the system must also inform the public about steps they should take to protect their health and may have to replace lead service lines under their control.

The Best Management Practices states:

EPA recommends that schools and child care facilities take action if samples from any drinking water outlets show lead levels greater than 20 parts per billion.

So in short the Lead and Copper Rule is stating that corrective action is to be taken if more than 10% of the taps exceed 15 PPB while the guidance document is saying take action if **ANY** sampling point exceeds 20 PPB. The Lead and Copper Rule criteria would still apply and the Guidance Document offers additional and potentially more conservative practices even though on the surface the number is higher.

I hope this helps clarify the issue
George

George L. Krisztian
Laboratory Director
Michigan Department of Environmental Quality
(517) 335-8812

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Wednesday, February 11, 2015 11:49 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Subject: Controlled Correspondence from citizen in Flint
Attachments: Flint Michigan Control 2 Feb 2015.docx

Importance: High

Hi, Steve. As we discussed, I've drafted our response and included information you gave us on Monday. Tom Poy has reviewed, so this is our final draft. If you could get back to me this afternoon with any changes, I'd appreciate it. These things are like ticking time bombs around here.

Thank you!

Jennifer

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, October 14, 2014 1:38 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Controlled Correspondence RE: Flint drinking water

Importance: High

Hi, Mike. Yep, another complaint about our favorite water supply ☺

Citizen lives at 324 West Jackson Avenue, Flint, 48505

She states, "Water quality is bad since switching to Flint River. My water stinks like sewage at times. I have developed a cough and rash, brown sediment in sink basins and kitchen sink stays backed up. I have written City Hall Water Dept and Council President for help, but no response."

I think the pos bacti/boil water advisory was in Sept, so can I say that bactis in the past few weeks have met State/Fed'l health standards? How's the TTHMs right now? Any other health standards close to being exceeded?

What do you attribute the sewer smell, and the brown sediment to? Has her area been flushed recently?

I will include the phone numbers of the Water Service Center and the Water Treatment plant that you gave me last time we spoke about Flint.

Can I include your phone number as a contact as well?

Thank you!

Jennifer

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Wednesday, October 28, 2015 10:27 AM
To: Busch, Stephen (DEQ); Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ)
Subject: Copper Data for Freeman Elementary
Attachments: Freeman Elementary Final.xlsx

Importance: High

Attached is the Freeman Elementary School data with a second tab add for the copper results. None of the samples exceeded the 1.3 PPM action level. Note that the action level is based on a 1 liter sample and these samples were 125 mls which would tend to concentrate first draw samples. There were a couple of samples that approached 1 ppm but the levels appeared to fall quickly.

George

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

SAMPLE #	ACODE	ANALYTE	RESULT	Sample Description
LF88751	PB	Lead	0.010	CF022 RM 12
LF88752	PB	Lead	0.003	CF022 RM 12
LF88753	PB	Lead	0.001	CF022 RM 12
LF88754	PB	Lead	0.001	CF022 RM 12
LF88755	PB	Lead	0.004	CF021 RM 12
LF88756	PB	Lead	0.007	CF021 RM 12
LF88757	PB	Lead	0.000	CF021 #12
LF88758	PB	Lead	0.000	CF021 RM 12
LF88759	PB	Lead	0.009	CF009 RM 5
LF88760	PB	Lead	0.002	CF009 RM 5
LF88761	PB	Lead	0.002	CF009 RM 5
LF88762	PB	Lead	0.001	CF009 RM 5
LF88763	PB	Lead	0.102	CF015 RM 11
LF88764	PB	Lead	0.126	CF015 RM 11
LF88765	PB	Lead	0.014	CF015 RM 11
LF88766	PB	Lead	0.011	CF015 RM 11
LF88767	PB	Lead	0.003	CF016 RM 11
LF88768	PB	Lead	0.003	CF016 RM 11
LF88769	PB	Lead	0.005	CF016 RM 11
LF88770	PB	Lead	0.004	CF016 RM 11
LF88771	PB	Lead	0.009	CF027 RM 21
LF88772	PB	Lead	0.007	CF027 RM 21
LF88773	PB	Lead	0.000	CF027 RM 21
LF88774	PB	Lead	0.000	CF027 RM 21
LF88775	PB	Lead	0.012	CF010 RM 6
LF88776	PB	Lead	0.004	CF010 RM 6
LF88777	PB	Lead	0.002	CF010 RM 6
LF88778	PB	Lead	0.000	CF010 RM 6
LF88779	PB	Lead	0.009	CF028 RM #21
LF88780	PB	Lead	0.002	CF028 RM #21
LF88781	PB	Lead	0.001	CF028 RM #21
LF88782	PB	Lead	0.001	CF028 RM #21
LF88783	PB	Lead	0.023	CF024 RM #19
LF88784	PB	Lead	0.003	CF024 RM #19
LF88785	PB	Lead	0.004	CF024 RM #19
LF88786	PB	Lead	0.003	CF024 RM #19
LF88787	PB	Lead	0.005	KC003 COMMUNITY ROOM
LF88788	PB	Lead	0.002	KC003 COMMUNITY ROOM
LF88789	PB	Lead	0.000	KC003 COMMUNITY ROOM
LF88790	PB	Lead	0.000	KC003 COMMUNITY ROOM
LF88791	PB	Lead	0.009	CF023 RM #19
LF88792	PB	Lead	0.009	CF023 RM #19
LF88793	PB	Lead	0.001	CF023 RM #19
LF88794	PB	Lead	0.000	CF023 RM #19
LF88795	PB	Lead	0.015	DW002 HALLWAY
LF88796	PB	Lead	0.006	DW002 HALLWAY
LF88797	PB	Lead	0.004	DW002 HALLWAY
LF88798	PB	Lead	0.001	DW002 HALLWAY
LF88799	PB	Lead	0.002	CF012 RM #9
LF88800	PB	Lead	0.004	CF012 RM #9
LF88801	PB	Lead	0.002	CF012 RM #9
LF88802	PB	Lead	0.000	CF012 RM #9
LF88803	PB	Lead	0.040	DW001 HALLWAY
LF88804	PB	Lead	0.006	DW001 HALLWAY

LF88805	PB	Lead	0.004	DW001 HALLWAY
LF88806	PB	Lead	0.001	DW001 HALLWAY
LF88807	PB	Lead	0.014	CF018 RM#15
LF88808	PB	Lead	0.005	CF018 RM#15
LF88809	PB	Lead	0.002	CF018 RM#15
LF88810	PB	Lead	0.002	CF018 RM#15
LF88811	PB	Lead	0.010	CF017 RM#15
LF88812	PB	Lead	0.014	CF017 RM#15
LF88813	PB	Lead	0.002	CF017 RM#15
LF88814	PB	Lead	0.002	CF017 RM#15
LF88815	PB	Lead	0.017	CF029 DHS OFFICE
LF88816	PB	Lead	0.012	CF029 DHS OFFICE
LF88817	PB	Lead	0.002	CF029 DHS OFFICE
LF88818	PB	Lead	0.000	CF029 DHF OFFICE
LF88819	PB	Lead	0.013	CF008 RM#4
LF88820	PB	Lead	0.006	CF008 RM#4
LF88821	PB	Lead	0.001	CF008 RM#4
LF88822	PB	Lead	0.000	CF008 RM#4
LF88823	PB	Lead	0.007	CF007 RM#3
LF88824	PB	Lead	0.006	CF007 RM #3
LF88825	PB	Lead	0.003	CF007 RM#3
LF88826	PB	Lead	0.002	CF007 RM#3
LF88827	PB	Lead	0.027	CF014 ROOM #10
LF88828	PB	Lead	0.007	CF014- ROOM #10
LF88829	PB	Lead	0.004	CF014-ROOM #10
LF88830	PB	Lead	0.003	CF014-ROOM #10
LF88831	PB	Lead	0.036	CF026 ROOM #14
LF88832	PB	Lead	0.030	CF026 ROOM #14
LF88833	PB	Lead	0.017	CF026 ROOM #14
LF88834	PB	Lead	0.004	CF026 ROOM #14
LF88835	PB	Lead	0.005	CF019 ROOM #17
LF88836	PB	Lead	0.003	CF019 ROOM #17
LF88837	PB	Lead	0.001	CF019 ROOM #17
LF88838	PB	Lead	0.000	CF019 ROOM #17
LF88839	PB	Lead	0.000	CF025 ROOM #14
LF88840	PB	Lead	0.003	CF025 ROOM #14
LF88841	PB	Lead	0.003	CF025 ROOM #14
LF88842	PB	Lead	0.002	CF025 ROOM #14
LF88843	PB	Lead	0.009	CF013 ROOM #10
LF88844	PB	Lead	0.003	CF013- ROOM #10
LF88845	PB	Lead	0.003	CF013 ROOM #10
LF88846	PB	Lead	0.003	CF013 ROOM #10
LF88847	PB	Lead	0.013	CF020 ROOM #17
LF88848	PB	Lead	0.004	CF020 ROOM #17
LF88849	PB	Lead	0.005	CF020 ROOM #17
LF88850	PB	Lead	0.003	CF020 ROOM #17
LF88851	PB	Lead	0.016	CF006 ROOM#2
LF88852	PB	Lead	0.003	CF006 ROOM #2
LF88853	PB	Lead	0.001	CF006 ROOM #2
LF88854	PB	Lead	0.001	CF006 ROOM #2
LF88855	PB	Lead	0.002	CF011 ROOM #7
LF88856	PB	Lead	0.000	CF011 ROOM #7
LF88857	PB	Lead	0.002	CF011 ROOM #7
LF88858	PB	Lead	0.000	CF011 ROOM #7
LF88859	PB	Lead	0.057	CF031 RAINBOW PRE K

LF88860	PB	Lead	0.003	CF031 RAINBOW PRE K
LF88861	PB	Lead	0.002	CF031 RAINBOW PRE K
LF88862	PB	Lead	0.000	CF031 RAINBOW PRE K
LF88863	PB	Lead	0.010	CF030 RAINBOW PRE K
LF88864	PB	Lead	0.003	CF030 RAINBOW PRE K
LF88865	PB	Lead	0.007	CF030 RAINBOW PRE K
LF88866	PB	Lead	0.000	CF030 RAINBOW PRE K
LF88867	PB	Lead	0.012	CF004 ROOM #1
LF88868	PB	Lead	0.007	CF004 ROOM #1
LF88869	PB	Lead	0.004	CF004 ROOM #1
LF88870	PB	Lead	0.002	CF004 ROOM #1
LF88871	PB	Lead	0.005	DW005 ROOM #1
LF88872	PB	Lead	0.003	DW005 ROOM #1
LF88873	PB	Lead	0.003	DW005 ROOM #1
LF88874	PB	Lead	0.002	DW005 ROOM #1

Sample Collector(s)	Site Code
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/ GEORGE KRISZTIAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/ GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/ GEORGE KRISZTIA	P1
TRACY JO DEVEREAUX	P2

MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02

SAMPNO	ACODE	ANALYTE	RESULT	Sample Description
LF88751	CU	Copper	0.32	CF022 RM 12
LF88752	CU	Copper	0.17	CF022 RM 12
LF88753	CU	Copper	0.15	CF022 RM 12
LF88754	CU	Copper	0.15	CF022 RM 12
LF88755	CU	Copper	0.09	CF021 RM 12
LF88756	CU	Copper	0.15	CF021 RM 12
LF88757	CU	Copper	0.14	CF021 #12
LF88758	CU	Copper	0.15	CF021 RM 12
LF88759	CU	Copper	0.31	CF009 RM 5
LF88760	CU	Copper	0.28	CF009 RM 5
LF88761	CU	Copper	0.08	CF009 RM 5
LF88762	CU	Copper	0.07	CF009 RM 5
LF88763	CU	Copper	0.43	CF015 RM 11
LF88764	CU	Copper	0.66	CF015 RM 11
LF88765	CU	Copper	0.19	CF015 RM 11
LF88766	CU	Copper	0.13	CF015 RM 11
LF88767	CU	Copper	0.99	CF016 RM 11
LF88768	CU	Copper	0.89	CF016 RM 11
LF88769	CU	Copper	0.16	CF016 RM 11
LF88770	CU	Copper	0.13	CF016 RM 11
LF88771	CU	Copper	0.19	CF027 RM 21
LF88772	CU	Copper	0.21	CF027 RM 21
LF88773	CU	Copper	0.16	CF027 RM 21
LF88774	CU	Copper	0.15	CF027 RM 21
LF88775	CU	Copper	0.24	CF010 RM 6
LF88776	CU	Copper	0.22	CF010 RM 6
LF88777	CU	Copper	0.17	CF010 RM 6
LF88778	CU	Copper	0.12	CF010 RM 6
LF88779	CU	Copper	0.17	CF028 RM #21
LF88780	CU	Copper	0.16	CF028 RM #21
LF88781	CU	Copper	0.15	CF028 RM #21
LF88782	CU	Copper	0.15	CF028 RM #21
LF88783	CU	Copper	0.23	CF024 RM #19
LF88784	CU	Copper	0.17	CF024 RM #19
LF88785	CU	Copper	0.16	CF024 RM #19
LF88786	CU	Copper	0.16	CF024 RM #19
LF88787	CU	Copper	0.31	KC003 COMMUNITY ROOM
LF88788	CU	Copper	0.27	KC003 COMMUNITY ROOM
LF88789	CU	Copper	0.14	KC003 COMMUNITY ROOM
LF88790	CU	Copper	0.13	KC003 COMMUNITY ROOM
LF88791	CU	Copper	0.13	CF023 RM #19
LF88792	CU	Copper	0.18	CF023 RM #19
LF88793	CU	Copper	0.15	CF023 RM #19
LF88794	CU	Copper	0.15	CF023 RM #19
LF88795	CU	Copper	0.21	DW002 HALLWAY
LF88796	CU	Copper	0.10	DW002 HALLWAY
LF88797	CU	Copper	0.07	DW002 HALLWAY
LF88798	CU	Copper	0.00	DW002 HALLWAY
LF88799	CU	Copper	0.23	CF012 RM #9
LF88800	CU	Copper	0.16	CF012 RM #9
LF88801	CU	Copper	0.11	CF012 RM #9
LF88802	CU	Copper	0.08	CF012 RM #9
LF88803	CU	Copper	0.41	DW001 HALLWAY
LF88804	CU	Copper	0.29	DW001 HALLWAY

LF88805	CU	Copper	0.17	DW001 HALLWAY
LF88806	CU	Copper	0.00	DW001 HALLWAY
LF88807	CU	Copper	0.20	CF018 RM#15
LF88808	CU	Copper	0.17	CF018 RM#15
LF88809	CU	Copper	0.14	CF018 RM#15
LF88810	CU	Copper	0.14	CF018 RM#15
LF88811	CU	Copper	0.17	CF017 RM#15
LF88812	CU	Copper	0.29	CF017 RM#15
LF88813	CU	Copper	0.17	CF017 RM#15
LF88814	CU	Copper	0.15	CF017 RM#15
LF88815	CU	Copper	0.59	CF029 DHS OFFICE
LF88816	CU	Copper	0.40	CF029 DHS OFFICE
LF88817	CU	Copper	0.08	CF029 DHS OFFICE
LF88818	CU	Copper	0.00	CF029 DHF OFFICE
LF88819	CU	Copper	0.28	CF008 RM#4
LF88820	CU	Copper	0.54	CF008 RM#4
LF88821	CU	Copper	0.17	CF008 RM#4
LF88822	CU	Copper	0.15	CF008 RM#4
LF88823	CU	Copper	0.17	CF007 RM#3
LF88824	CU	Copper	0.27	CF007 RM #3
LF88825	CU	Copper	0.09	CF007 RM#3
LF88826	CU	Copper	0.07	CF007 RM#3
LF88827	CU	Copper	0.11	CF014 ROOM #10
LF88828	CU	Copper	0.10	CF014- ROOM #10
LF88829	CU	Copper	0.10	CF014-ROOM #10
LF88830	CU	Copper	0.08	CF014-ROOM #10
LF88831	CU	Copper	0.75	CF026 ROOM #14
LF88832	CU	Copper	0.66	CF026 ROOM #14
LF88833	CU	Copper	0.35	CF026 ROOM #14
LF88834	CU	Copper	0.20	CF026 ROOM #14
LF88835	CU	Copper	0.16	CF019 ROOM #17
LF88836	CU	Copper	0.15	CF019 ROOM #17
LF88837	CU	Copper	0.14	CF019 ROOM #17
LF88838	CU	Copper	0.14	CF019 ROOM #17
LF88839	CU	Copper	0.14	CF025 ROOM #14
LF88840	CU	Copper	0.25	CF025 ROOM #14
LF88841	CU	Copper	0.17	CF025 ROOM #14
LF88842	CU	Copper	0.18	CF025 ROOM #14
LF88843	CU	Copper	0.06	CF013 ROOM #10
LF88844	CU	Copper	0.07	CF013- ROOM #10
LF88845	CU	Copper	0.10	CF013 ROOM #10
LF88846	CU	Copper	0.19	CF013 ROOM #10
LF88847	CU	Copper	0.19	CF020 ROOM #17
LF88848	CU	Copper	0.16	CF020 ROOM #17
LF88849	CU	Copper	0.16	CF020 ROOM #17
LF88850	CU	Copper	0.14	CF020 ROOM #17
LF88851	CU	Copper	0.17	CF006 ROOM#2
LF88852	CU	Copper	0.22	CF006 ROOM #2
LF88853	CU	Copper	0.11	CF006 ROOM #2
LF88854	CU	Copper	0.11	CF006 ROOM #2
LF88855	CU	Copper	0.20	CF011 ROOM #7
LF88856	CU	Copper	0.15	CF011 ROOM #7
LF88857	CU	Copper	0.11	CF011 ROOM #7
LF88858	CU	Copper	0.06	CF011 ROOM #7
LF88859	CU	Copper	0.38	CF031 RAINBOW PRE K

LF88860	CU	Copper	0.21	CF031 RAINBOW PRE K
LF88861	CU	Copper	0.27	CF031 RAINBOW PRE K
LF88862	CU	Copper	0.19	CF031 RAINBOW PRE K
LF88863	CU	Copper	0.38	CF030 RAINBOW PRE K
LF88864	CU	Copper	0.42	CF030 RAINBOW PRE K
LF88865	CU	Copper	0.59	CF030 RAINBOW PRE K
LF88866	CU	Copper	0.21	CF030 RAINBOW PRE K
LF88867	CU	Copper	0.27	CF004 ROOM #1
LF88868	CU	Copper	0.25	CF004 ROOM #1
LF88869	CU	Copper	0.21	CF004 ROOM #1
LF88870	CU	Copper	0.08	CF004 ROOM #1
LF88871	CU	Copper	0.10	DW005 ROOM #1
LF88872	CU	Copper	0.09	DW005 ROOM #1
LF88873	CU	Copper	0.09	DW005 ROOM #1
LF88874	CU	Copper	0.06	DW005 ROOM #1

Sample Collector(s)	Site Code
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/ GEORGE KRISZTIA	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR/ ANDY NEUMAN	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	P1
TRACY JO DEVEREAUX/ GEORGE KRISZTIAN	P2
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F01
TRACY JO DEVEREAUX/GEORGE KRISZTIAN	F02
JOE MADZIAR/ ANDY NEUMAN	P1
JOE MADZIAR	P2
JOE MADZIAR/ ANDY NEUMAN	F01
JOE MADZIAR/ ANDY NEUMAN	F02
TRACY JO DEVEREAUX/ GEORGE KRISZTIA	P1
TRACY JO DEVEREAUX	P2

MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02
MIKE PRYSBY/ LOIS GRAHAM	P1
MIKE PRYSBY/ LOIS GRAHAM	P2
MIKE PRYSBY/ LOIS GRAHAM	F01
MIKE PRYSBY/ LOIS GRAHAM	F02

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, November 04, 2015 1:59 PM
To: 'bwright@cityofflint.com'; Michael Glasgow
Cc: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: Corrosion Control Permit
Attachments: PO4 Permit Oct 28th.pdf

Brent, Michael

Attached is the Act 399 permit authorizing installation of the corrosion control treatment system at the water treatment plant.

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151104 OCT 28 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537		
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment 4 Corrosion Control	4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

CC:

DEQ
 RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

Issued by:

Reviewed by:

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project entails installation of phosphate feed systems at both Control Station #2 (CS#2) and Pump Station #4 (PS#4). Feed at CS#2 will provide the ability to add phosphate for corrosion control to finished water supplied from the Detroit Water & Sewer Department (DWSD). Feed at PS#4 will provide the ability to add phosphate to finished water to supply from either the Flint River or Lake Huron via the Karegondi Water Authority (KWA). Both feed systems are temporary systems until the planned filter transfer pump station is constructed. A permanent phosphate feed system will be constructed as part of that contract.

The feed rate will be proportionally controlled based on the water flow rate and will be tied to the existing SCADA system. See attached basis of design for more detailed information.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.	
7. Design engineer's name, engineering firm, address, phone number, and email address: Jeremy Nakashima, PE Lockwood, Andrews and Newnam, Inc. 1311 South Linden Rd, Suite B Flint, MI 48532 jnnakashima@lan-inc.com	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☒ Engineering firm listed in Box 7. ☐ Other - name, address, and phone number listed below.
9. Is a basis of design attached? ☒ YES ☐ NO If no, briefly explain why a basis of design is not needed.	
10. Are sealed and signed engineering plans attached? ☒ YES ☐ NO If no, briefly explain why engineering plans are not needed.	
11. Are sealed and signed construction specifications attached? ☒ YES ☐ NO If specifications are not attached, they need to be on file at DEQ.	
12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed? ☒ YES ☐ NO If no, explain which deviations were made and why.	
13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved? ☒ YES ☐ NO If no, describe what coatings, additives or materials did not meet the applicable standard and why.	
14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.) ☒ YES ☐ NO If no, explain how access will be obtained.	
15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451? ☐ YES ☒ NO If yes, a wetland permit must be obtained.	
16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules? ☐ YES ☒ NO If yes, a flood plain permit must be obtained.	
17. Is the project construction activity within 500 feet of a lake, reservoir, or stream? ☐ YES ☒ NO If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES

☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☒ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES

☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES

☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the PLANT SUPERVISOR (title/position) for

(print)

(print)

CITY OF FLINT WATER PLANT (entity owning proposed facilities) certify that this project has

(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

[Signature]

Signature*

10-16-2015

Date

(810) 787-4537

Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 4 Corrosion Control

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application all customers
- C. Total number of service connections ultimately served by entire project all customers
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|---------------------------|
| 1. Initial design average day flow (mgd) | <u>18.3</u> |
| 2. Initial design maximum day flow (mgd) | <u>25.4</u> |
| 3. Total design average day flow (mgd) | <u>24.0</u> |
| 4. Total design maximum day flow (mgd) | <u>36.0</u> |
| 5. Required fire flows: ⁽¹⁾ | _____ gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
|------------------------|

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

City of Flint

Phase II, Segment 4 Corrosion Control

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that initially there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal. Phosphoric acid will be stored in delivered totes and will be placed with containment pallets for dual containment.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.



**Lockwood, Andrews
& Newnam, Inc.**

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

☐ UPS ☐ DELIVERY SERVICE
☐ FEDEX ☐ HAND DELIVER
☐ OVERNIGHT

☐ REGULAR MAIL
☐ PICK-UP
☒ OTHER Extranet(To PM)

Est. 1935

AUSTIN, TX
CHICAGO, IL
CLEARWATER, FL
COLLEGE STATION, TX
DALLAS, TX
FLINT, MI
FORT WORTH, TX
HOUSTON, TX
HUNTINGTON BEACH, CA
LAS VEGAS, NV
LOS ANGELES, CA
MIAMI, FL
MILPITAS, CA
PHOENIX, AZ
SACRAMENTO, CA
SAN ANTONIO, TX
SAN MARCOS, TX
WACO, TX

To: Michael Prysby		Date 10-16-13	
Company: MDEQ		Project Number 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications ☐ Reports ☐ Submittal Data ☐ Proposal ☐ As Noted		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature	

Quantity	Description
3	Full Set of Plans for Ph2-Seg4 Corrosion Control
1	Act 399 Permit Application
1	11x17 Set of Plan for Ph2-Seg4 Corrosion Control

Remarks

These plans have been modified slightly from the set electronically submitted last night.

We look forward to your comments and approval.

Thanks.

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532
TEL 810.820.2682
FAX 810.820.2703
www.lan-inc.com

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matta, PE

IBC TOTE SCALE

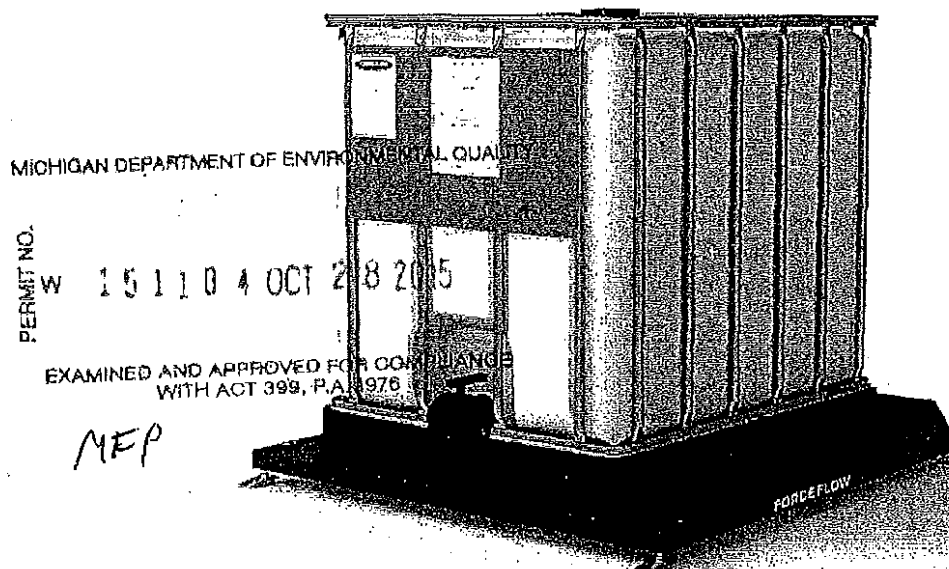
FOR CHEMICAL IBC TOTES

Safely track
chemical usage
and tank levels

Warn of dangerous
over and under-
feed conditions

Prevent system
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empty

4-20mA remote
monitoring reduces
operator exposure
to chemicals



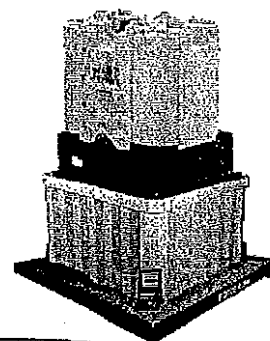
NO FINGER POINTING,
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Strict federal and state reporting requirements have created a need for water and wastewater plant operators to easily and accurately track chemical feed rates and usages. The IBC Tote Scale gives you this information along with the assurance that your chemical supply will not unexpectedly run out.

The heavy duty steel platform is protected with our advanced 80 mil thick TUF-COAT™ Environmental Armor. Tuf-Coat is highly resistant to chemicals, abrasion, impact and ultraviolet light degradation making the IBC Tote Scale ideal for even the harshest environments. Options include 316 stainless steel and MaxSense™ high accuracy models.

The IBC Tote Scale utilizes weighing technology to create a highly reliable, non-contacting chemical monitoring system that avoids problems other sensor technologies face caused by irregular tank shapes, corrosive chemical fumes, fluctuating temperatures and changes in specific gravity.



FORCE FLOW

IBC TOTE SCALE

MODELS AND ORDERING INFORMATION

IBC Tote Scales do not include weight indicating instrument. Select from the following: Wizard 4000® Advanced Digital Display (Bulletin 518), the SOLO® G2 Digital Weight Display (Bulletin 516), the SOLO XT® Hydraulic Digital Display (Bulletin 514), the Century Hydraulic dial (Bulletin 519) or Hypo Track® (Bulletin 517). Please order indicator separately.

ELECTRONIC - Single Load Cell Platform (Includes platform with backstop and electronic load cell with 20 ft. cable. Lengths up to 100 ft. available; request when ordering.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DRxxTB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
54-DRxxTBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/4 of 1% FS
60-DRxxTB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/4 of 1% FS
60-DRxxTBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/4 of 1% FS



WIZARD 4000®

SOLO® G2

HYPO TRACK®



ELECTRONIC - Hi Accuracy 4-Load Cell Platform (Includes platform and (4) electronic load cells with 20 ft. of cable. Lengths up to 100 ft. available; request at time of purchase. Backstop not included or necessary on these models but available upon special request.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-DRxxTB-HA4	TUF-COAT® STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
54-DRxxTBS-HA4	316 STAINLESS STEEL	54"	54"	N/A	3.25"	1/10 of 1% FS
60-DRxxTB-HA4	TUF-COAT® STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS
60-DRxxTBS-HA4	316 STAINLESS STEEL	60"	60"	N/A	3.25"	1/10 of 1% FS



WIZARD 4000®

SOLO® G2

HYPO TRACK®



HYDRAULIC - Single Load Cell Platform (Includes platform with backstop, and hydraulic load cell with 12 ft. hose and quick connect. Hose/tubing lengths up to 100 ft. available to allow remote mounting of indicator; request at time of purchase.)

MODEL	MATERIAL	X	Y	Z	H	ACCURACY
54-HYxxTB	TUF-COAT® STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
54-HYxxTBS	316 STAINLESS STEEL	54"	54"	58"	3.25"	1/2 of 1% FS
60-HYxxTB	TUF-COAT® STEEL	60"	60"	64"	3.25"	1/2 of 1% FS
60-HYxxTBS	316 STAINLESS STEEL	60"	60"	64"	3.25"	1/2 of 1% FS

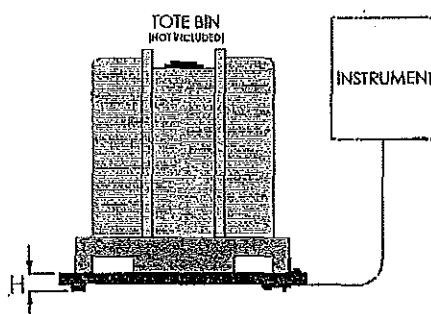
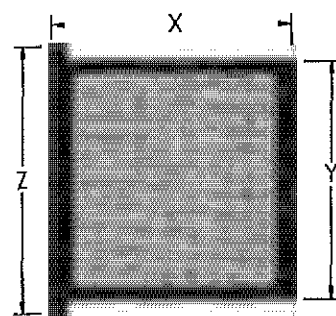


CENTURY®

SOLO XT®



xx = CAPACITY: 1000 lbs = "10", 2000 lbs = "20", 3000 lbs = "30", 4000 lbs = "40", 5000 lbs = "50"



SPECIFYING GUIDELINES:

- For maximum accuracy, size scale capacity to match the gross weight (chemical plus tote tare weight).
- Tote size should not exceed platform size.
- Supply connections must be flexible and preferably connected to tote over pivoted side of platform.

Please visit www.forceflow.com for drawings, engineered specifications and manuals.

FORCE FLOW

MODEL NUMBERS (for Load Cell & Platform)

60-DR30TC-HA4 (3,000 Lbs.) 60" x 60" x 3.25"
 60-DR40TC-HA4 (4,000 Lbs.) 60" x 60" x 3.25"
 60-DR50TC-HA4 (5,000 Lbs.) 60" x 60" x 3.25"
 60-DR60TC-HA4 (6,000 Lbs.) 60" x 60" x 3.25"

For Stainless Steel platform, as "S" after "TC", i.e. 60-DR30TCS-HA4.
 For other capacities and platform sizes, consult factory.

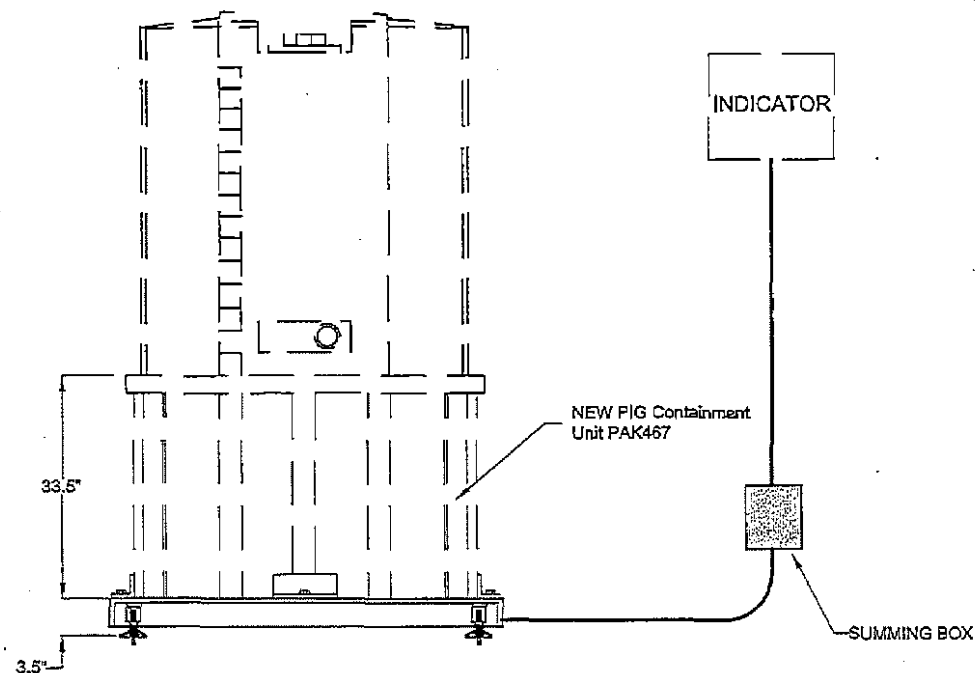
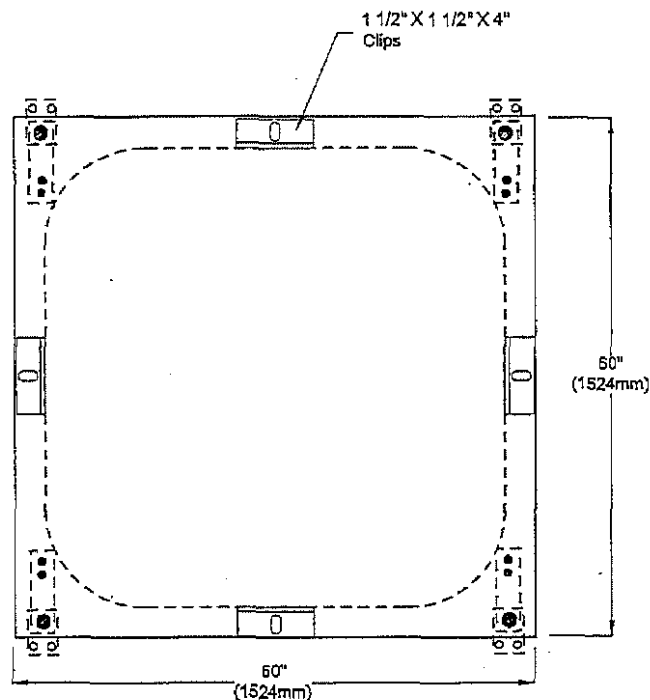
MODEL NUMBER (for SOLO 1000 Indicator)

SR-1000-1 1-Channel SOLO 1000 Indicator
 SR-1000-2 2-Channel SOLO 1000 Indicator

MODEL NUMBER (Containment Unit)

PAK467 400 gal. NEW PIG Poly IBC Containment Unit

_____ Scale Model Number
 _____ Pounds or Kilogram Indication
 _____ Feet of Cable (20' Standard)
 _____ Tote Skid Size
 400 _____ Containment Size (Gallons)

**INSTALLATION NOTE:**

We recommend using a forklift to load/unload totes.
 If a pallet jack is to be used, scale platform must be pilt mounted so deck is flush with floor surface.
 Surface mounting with use of inclined load ramps are NOT RECOMMENDED.

FORCE FLOW

2430 Stanwell Dr, Concord, Ca 94520 USA
 1-800-893-6723 US & Canada, Fax: 925-686-6713
 WWW.forceflow.com / info@forceflow.com

PL_SHAEL_SUBMITTAL FORMS/Issued Drawings/31431 HA-Tote Bin Scale 60 Containment.dwg

HI-ACCURACY ELECTRONIC
 60" TOTE BIN SCALE
 CONTAINMENT

Drawn by: KBV

Date: 1/23/09

Revised: 4/13/10

Scale:

Drawing Number

31431

---NOT SUPPLIED BY FORCE FLOW---
For use with Force Flow Scale Model 60-DR100TCHA4



New Pig

Your partner for a clean
and safe workplace.

1-800-HOT-HOGS® (468-4647)

Product Data Sheet

Item Number: PAK467

Item Name: PIG® Poly IBC Containment Unit

Load Capacity UDL:

- 12000 lbs./each (5443.2 kg/each)

Sump Capacity:

- 400 gal./each (1514 L/each)

Options Available:

Item #	Size	Color	Misc. Features	Amount	Length	Width	Height	Depth	Int. Dia.	Ext. Dia.	Weight	Qty/Pallet
PAK467	—	—	—	1 each	58" (147.3cm)	58" (147.3cm)	33.5" (85.1cm)	—	—	—	415lbs. (188.2kg)	1

Color: White/Black

Description:

Polyethylene containment unit used to help meet containment regulations when storing IBCs.

Application:

Used to help meet containment regulations when storing IBCs of 400 gallons or less containing materials compatible with polyethylene. IBCs can be stacked two high.

Product Features:

Super-strong Containment Unit helps you comply with regulations and store IBC tanks safely. Capture leaks, drips and spills to keep floors dry and workers safe.

- Heavy-duty construction permits double-stacking of IBCs to save space
- Solid anti-slip deck holds a variety of IBC sizes; if tank has feet or pegs, be sure to use proper support pads or plates
- Positioning pegs in pedestals keep deck from shifting
- Polyethylene construction resists UV rays, rust, corrosion and most chemicals
- Translucent white sidewalls allow easy visual inspection
- Arrives ready to use with no assembly required

Composition:

- Sump - Polyethylene
- Grates - Injection Molded Polyethylene

This product helps you comply with:

Regulatory Citation	Summary
40 CFR 264.175	Hazardous waste containment systems must be free of structural cracks or gaps, be designed to keep spilled liquids from remaining in contact with the container, prevent run-on and "have sufficient capacity to contain 10% of the volume of the containers, or the volume of the largest container, whichever is greater."

Additional Specifications:

- Dimensions (Grate): 52" L x 52" W

Disclaimers:

- **Flammables Notice:** If using this product with flammable liquids, please consider the regulations that apply to storage and handling of flammable liquids and the safety of this application, specifically flammable vapors, static discharge and heat sources. For further assistance, please call Technical Services.

PDS generated: Jul 14, 2008

One Pork Avenue, Tipton, PA 16684-0304 • 1-800-HOT-HOGS® (468-4647)
Fax: 1-800-621-PIGS® (621-7447) • Email: hothogs@newpig.com • Web: newpig.com

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Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal $5,974 \times 0.75$

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 $4,480/97.9913$

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{3-}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{3-}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

Proposed Operating Parameters

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

MFP

	Plant Flow	Dosage as PO_4^{3-} *	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/l	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

Maximum feed rate (Max Flow $\times$ Max Dosage)

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 2.0 \text{ ppm} / 1,408 \text{ g/gal} = 134.30 \text{ gpd Phosphoric Acid}$$

Average feed rate (Avg Flow $\times$ Avg Dosage)

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 26.21 \text{ gpd Phosphoric Acid}$$

Minimum feed rate (Min Flow $\times$ Min Dosage)

$$8 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 13.10 \text{ gpd Phosphoric Acid}$$

Storage Requirements

30 days supply at average flow and dosage = $26.21 \text{ gpd} \times 30 \text{ days} = 786 \text{ gal.}$

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

Four Function Valve
AUTOPRIME™ Liquid End
High Viscosity Liquid End
Low Level Float Switch
Dig-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

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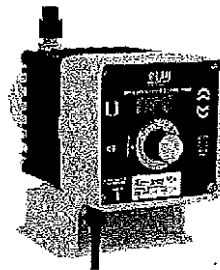
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Series C Chemical Metering Pumps

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps have been an industry standard for over 20 years. Designed for Municipal/Industrial applications, the familiar yellow and black pumps have a rugged, totally enclosed, chemically resistant housing for protection in the harshest environments. Encapsulated electronics and a rigid housing and stroke bracket ensure years of precise, repeatable performance.



High Resolution Image

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- Adjustable stroke frequency and the flexibility of up to 1000:1 turndown ratio
- Manually adjustable stroke length provides accurate pump output adjustment
- NEMA 4X / IP65 enclosures for protection against corrosive environments
- Time tested electronics for reliable, repeatable performance
- Totally encapsulated electronics for protection against moisture and corrosive conditions
- Inputs for low level switch available on certain models
- Models with external pacing for flow proportional applications
- Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)
- *UL, *CUL, NSF 50, NSF 61, *CE Certifications

Control Codes:

- 1 -- Dual Manual Control (speed and stroke length)
- 7 -- Pulse Input / Dual Manual Control
- 9 -- Pulse/Analog Input / Dual Manual Control

Output Codes with standard liquid end	
Max Capacity:	Max Pressure:
*CX0 - 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
*CX1 - 2.5 GPH (9.5 l/h)	150 psi (10.3 Bar)
*CX2 - 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 - 6.0 GPH (30.3 l/h)	60 psi (4.1 Bar)
*CX4 - 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 - 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 - 10.0 GPH (38.0 l/h)	80 psi (5.5 Bar)
C78 - 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

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EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MJP