Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, October 21, 2015 5:19 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Daily update

Action Item 11. Finalize sampling protocol.

- Comments received from EPA Task Force. Continuing to finalize protocol.

Action Item 12. Confirm school sampling logistics.

- Sampling team for first effort at Freeman Elementary School has been assembled and is prepared to sample on Saturday.

Action Item 19. Review corrosion control treatment plan and get any EPA comments.

- Responding to EPA task force on corrosion control proposal comments and clarifying information. Staff are following up on questions raised during the conference call on Tuesday.

Action Item 22. Provide city of Flint updated monitoring schedule based on Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) service.

- Monitoring Schedule letter expected to be mailed tomorrow 10/22. The monitoring schedule addresses change back to a customer supply of GLWA. A final copy will be attached to tomorrow's update.

Rennaker, Joanne (DEQ)

From: Adams, Dominic <DADAMS5@mlive.com>
Sent: Friday, April 18, 2014 10:15 AM
To: Busch, Stephen (DEQ)
Subject: DEQ in Flint Friday

Mr. Busch:

Dominic Adams with The Flint Journal here. We've spoken about the Flint River becoming Flint's primary drinking water source in the past. I was told that the DEQ would be in Flint today testing the plant and making sure the work completed is doing everything needed. I'd like to talk to you following your tests today. When is a good time to talk? I can give you a call or you can feel free to call me at 810-241-8803.

Thanks a lot and have a great day!

Dominic Adams | metro reporter |The Flint Journal | 810-241-8803 | dadams5@mlive.com | On Twitter |On Facebook|

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, October 12, 2015 4:25 PM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: Disinfection of Pipeline - Status update

George,

Based upon my discussion with water utility operators from the city of Flint and Genesee County, chlorination of the 72-inch transmission main (pipeline) began Friday night and concluded late Saturday. Chlorine residuals were measured mid-way along the pipeline (3.5 miles being disinfected) and at the downstream end (Control Sta. #3 at the Flint WTP) early Sunday and were approximately 120 mg/l based on field titration. The Sunday morning sample at CS #3 was mistakenly reported at 10 ppm due to an incorrect ratio used in the titration calculation. The city and the county performed another chlorine residual test around noon today and confirmed the residual ranging between 110 and 120 mg/l at both locations. I instructed the city to hold the water for an additional 3 hours to conform to the "slug" method of disinfection. Flushing of the pipeline to the Dort Reservoir is to proceed after 4pm today. The chlorinated water will be sent to Dort and diluted with water from Detroit until the concentration is reduced to normal distribution system levels. Water from the Dort Reservoir will be distributed to the city after acceptable bacteriological sample results are obtained (see below).

Both parties anticipate having the pipeline and Dort reservoir ready for the collection of samples for bacteriological analysis tomorrow (set of three samples) with the second set of samples to be collected on Wednesday. The pipeline that will provide the city with water from Detroit could be placed into service by this Thursday (the soonest) if no glitches are encountered with the start-up procedure.

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

Rennaker, Joanne (DEQ)

From: Daugherty Johnson <djohnson@cityofflint.com>
Sent: Thursday, April 24, 2014 12:03 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Howard Croft
Subject: DWSD back up agreement

Hello Steve and Mike. As you are aware, the City has undergone extensive upgrades to our Water Treatment Plant and it's associated facilities. Our intentions and efforts have been to operate our facility as the primary drinking water source for the City of Flint. Through consultation with your office and our engineering firm we've developed a system of redundant electrical systems, treatment processes and adequate finished water storage to negate the need for a signed back up agreement with DWSD due to their termination of our contract. Upon inspection of these facilities would you convey your concurrence that there is no regulatory requirement for us to sign a back up agreement with DWSD.

Thank you
Daugherty Johnson
Utilities Administrator
City of Flint

Rennaker, Joanne (DEQ)

From: Collett, Joli (DEQ)
Sent: Wednesday, January 14, 2015 3:53 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Cc: Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Thelen, Mary Beth (DEQ); Alexander, Richard (DEQ); Kohlhepp, Amy (DEQ); Drullinger, Dave (DEQ)
Subject: EAC Call - City of Flint, Genesee County Water Concern MEDIA CONCERN

Importance: High

FYI –
This email is being sent to you due to the nature of the call and that caller reported he spoke with Andrew, Governor's office, and was referred to DEQ to report.

Caller information:
Joe Weihr
248-820-2709
County: Genesee
City: Flint

Report:

- Water in Flint toxic, town hall meeting at Antioch Baptist Mission Church, about the water, media present, 300 people, children attended, some w/rashes from the water.
- He just got off the phone with Andrew, Governor's office ref DEQ.
- Has called EPA reporting.
- City of Flint sent letter admitting water does not meet EPA water quality standard.
- Water is no longer hooked up to Flint water, city decided three years ago to draw water out of the Flint water and processing it rather than buying it from the City of Detroit. This is when the health issues began.

Action:

- Provided contact number for Stephen Busch,
- Transferred call, stayed on line, went to voice mail,
- Got back on line, let caller know call went to voice and inquired his preference of leaving a message or should I continue to find a live individual.
- He stated he was fine leaving a message. I reminded him that he has the number if he would like to call Busch directly he could do so.

Further action:
Email sent to including EXEC Communications due to caller stating he contacted the Governor's office prior to calling us.

Joli Collett, Department Analyst
Agent 23120
Department of Environmental Qualtiy
Office of Environmental Assistance
Environmental Assistant Center 1-800-662-9278
Pollution Emergency Alerting System (PEAS) 1-800-292-4706
Deq-assist@michigan.gov
(517) 284-6868

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, September 10, 2015 5:58 PM
To: Shekter Smith, Liane (DEQ)
Cc: Benzie, Richard (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Poy, Thomas; Porter, Andrea; Devereaux, Tracy Jo (DEQ); Kuefler, Janet; Shoven, Heather; Deltoral, Miguel
Subject: Final Notes from call Tuesday 8/31/15 with MI DEQ RE: Flint

Thank you, Liane, for your edits—I incorporated all of your edits, and further clarified who said what.
Jennifer

Date: August 31, 2015
Present: Liane Shekter Smith, Richard Benzie, Steve Busch, (2 other MDEQ staff?), Tom Poy, Andrea Porter, Janet Kuefler, Jennifer Crooks

STRATEGIC NEXT STEPS FOR FLINT TO ADDRESS LEAD CORROSION CONCERNS

Tom Poy discussed Marc Edwards' website, "Flint, MI Water Study Updates" (https://flintwaterstudyupdates.wordpress.com/). The discussion focused on the lead sampling and analytical results Marc Edwards' team posted to their website. Tom emphasized that EPA is not involved with Marc Edwards' work in Flint. Tom mentioned that the Edwards team's samples may not have been analyzed by a certified lab (which is only required for compliance samples) nor taken from sites that qualify as Tier 1 for LCR compliance sampling, but the results give further evidence that lead levels in Flint are trending upward. (The conclusion that there is an increasing trend of lead concentrations at consumer taps builds upon earlier compliance sampling taken by Flint in 2014 and 2015 that showed the 90th percentile of the 1st 6-month sampling period at 6ppb, then the 90th percentile of the 2nd 6-month sampling period at 11ppb.) Everyone at the meeting agreed that Flint is in compliance with the Safe Drinking water Act action level for lead. However, because the city's population exceeds 50,000 persons, MDEQ stated that Flint needs to additionally optimize their treatment process to reduce lead levels further, if possible.

The "Flint, MI Water Study Updates" website is putting added pressure on MDEQ and EPA to ensure that Flint addresses their lack of optimized corrosion control treatment in an expedited manner in order to protect the residents from exposure to high lead levels. Richard noted that there are numerous systems across the country that have installed corrosion control treatment, have optimized their corrosion control, but did not necessarily reduce their lead levels. We all acknowledged that this is true. MDEQ acknowledged that implementing installation of corrosion control treatment in Flint is prudent to protect public health since there are approximately 15,000 lead service lines within the city. EPA acknowledged that to delay installation of corrosion control treatment in Flint would likely cause even higher levels of lead over time as Flint's many lead service lines are continuously in contact with corrosive water.

Region 5 and MDEQ brainstormed on strategic next steps for Flint to address lead corrosion concerns. These steps included:

1. **Public Education for Flint Residents.** Liane has contacted the Department of Community Health to discuss developing a consumer lead education piece outlining the consumer's options to lower the lead in their drinking water. The Region was glad to hear of a plan to initiate Lead Public Education since this will provide the public immediate actions they can take. The educational material could include steps consumers can take to reduce their exposure to lead in drinking water (flushing their lines after long stagnation periods, using filters certified to remove lead, etc.) as well as longer term fixes to remove lead sources (for example, financing the cost to

remove any part of a lead service line on the owner's property at the same time as Flint is replacing its portion of the lead service line).

2. **Gathering Information on Flint's Future Treatment Plans.** Steve Busch said Flint and their engineering consultants were meeting this week (Sept 1) to discuss conceptually the necessary optimized corrosion control treatment at Flint. Tom Poy shared EPA lead experts' (Mike Schock and Darren Lytle of EPA's Office of Research and Development in Cincinnati) caution against simply adding orthophosphate without first studying the water quality and existing distribution system conditions to ensure that any installed treatment has a good chance of working. EPA lead experts have research and field experience showing the complexity of optimizing corrosion control treatment when water quality is significantly changed, as is the case for Flint.
3. **Offering Flint Free Help from EPA Experts.** Steve Busch has already provided the names of EPA lead experts (Mike Schock and Darren Lytle) to Flint, as has Susan Hedman, R5 Administrator. MDEQ and Region 5 agree that, to successfully control lead corrosion in the distribution system, Flint needs to review this situation holistically, while also addressing the lead issue in an expedited manner.
4. **Laying Groundwork for MDEQ/EPA Collaboration with Flint.** If Flint accepts the offer of technical assistance for optimizing corrosion control, Tom Poy suggested that MDEQ and EPA lead experts (Mike Schock and Darren Lytle) form a partnership to provide such help. EPA experts are able to provide pipe scale analyses, as well as other laboratory support. Although Flint (using their consultant) bears the ultimate responsibility for designing and installing corrosion control, MDEQ and EPA experts are willing and able to provide advice throughout the process.

END

Jennifer

Jennifer Kurtz Crooks
Michigan Program Manager
Ground Water and Drinking Water Branch
U.S. EPA Region 5
77 West Jackson Blvd.
Chicago, Illinois 60604
312.886.0244
crooks.jennifer@epa.gov
312.582.5853 (fax)

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, July 28, 2015 9:47 AM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ); Monosmith, Carrie (DEQ); DeBruyn, Dana (DEQ); Dettweiler, Dan (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ); Holdwick, Kevin (DEQ)
Cc: Poy, Thomas; Bair, Rita; Damato, Nicholas; Shoven, Heather; Kuefler, Janet; Murphy, Thomas; Porter, Andrea; Deltoral, Miguel
Subject: Final Notes from Michigan semi-annual call on 6/10

I was supposed to finalize these in mid-July, but I didn't receive any changes from anyone, so these notes are final now. Thank you all again for participating.
Jennifer

From: Crooks, Jennifer
Sent: Wednesday, July 01, 2015 5:31 PM
To: Shekter Smith, Liane (DNRE); Richard Benzie; kris philip; Monosmith, Carrie (DNRE); DeBruyn, Dana (DEQ); Dettweiler, Dan (DEQ); Busch, Stephen (DEQ); 'Prysby, Mike (DEQ)'; 'cookp@michigan.gov'; Holdwick, Kevin (DEQ)
Cc: Thomas Poy; Bair, Rita; Damato, Nicholas; Shoven, Heather; Kuefler, Janet; Murphy, Thomas; Porter, Andrea; Deltoral, Miguel
Subject: Draft Notes from Michigan semi-annual call on 6/10

All—Below are my draft notes from our call last week, June 10, 2015. Thank you all for participating. I apologize for the delay in getting these out in draft to you all for review—I was hoping to get a couple of items ironed out that were fuzzy during our discussions, but hasn't happened yet. Several ACTION items below. So, please review to make sure I documented our discussion/agreements correctly, and feel free to edit as needed. I you could get back to me by July 13, that would be great. Thank you!

Jennifer

Attendees:
MDEQ: Liane Shekter-Smith, Richard Benzie, Carrie Monosmith, Kris Philip, Dan Dettweiler, Marjorie Rodriguez (Student), Kevin Holdwick, Mike Prysby, Dana DeBruyn, Steve Busch
EPA Region 5: Tom Poy, Rita Bair, Nick Damato, Janet Kuefler, Michele Palmer, Tom Murphy, Heather Shoven, Cary McElhinney, Andrea Porter, Miguel Deltoral, Mostafa Noureldin

Summary:

1.Changes in Lead Disinvestments and Commitments for FY 2016 ARDP—for discussion: Due to our extreme focus on lead in drinking water, this is the consensus here.

a. Consumer notification of tap results at NTNCWSs:

(Suggested wording) The NCWS program commits to full implementation of the lead consumer notification of tap results requirement, to begin in CY 2016. Region 5 will assist in a notification outreach effort in late FY 2015 to remaining 698 NTNCWSs that are not schools/daycares, to begin providing lead consumer notice in CY 2016. NCWS program commits

to include information on providing lead consumer notice in the annual monitoring letter sent to all NTNCWSs for CY 2016.

STATE: The State found this change in the wording acceptable.

b. Collection of Lead samples at NTNCWSs during June – September 2016 timeframe

(Suggested wording) NCWS program commits to including information in the applicable NTNCWS annual monitoring letters of the requirement to collect their annual/triennial lead sample between June and September only, during CY 2016. The MDEQ NCWS program currently does not have the capability to easily track lead sampling compliance within this specific timeframe.

STATE: The State found this change in the wording acceptable.

c. Follow-up Actions for NTNCWSs that sample outside of June-September 2015 timeframe

(From 5/5/15 call notes w/EPA) MDEQ commits to providing Region 5 with all CY 2015 lead (and copper?) sample data for all NTNCWSs by March 2016 so that EPA can analyze how many PWSs monitored outside the June through October timeframe. EPA commits to follow-up with MDEQ to discuss follow-up actions.

STATE: The State agreed to providing EPA R5 the raw lead and copper data for all CY 2015 for all NTNCWSs. The WaterTrack database does have data, but it can't generate violations. MDEQ doesn't commit to enforcing against 2016 violators in FY 2016. The State said, it is planning on disinvesting in enforcing against these violators due to limited capability of WaterTrack; however, if the State's noncommunity data management capabilities improve during FY 2016, implementation of this disinvestment may become a reality. The State has not designated an alternate timeframe, or done system specific documentation as to why the system qualifies for a different timeframe.

d. Submittal of the lead and copper reporting form

(Suggested wording) MDEQ commits to requiring CWSs and NTNCWSs to submit the lead and copper reporting form via the annual monitoring letters to each system, tracking CWSs and NTNCWSs submittal of the lead and copper reporting form, and commits to issuing violations for failure to submit the lead and copper reporting form. The reporting form provides the address of the sample site, designates sampling site selection criteria, and explanation(s) for any changes in sampling sites.

STATE: Dan Dettweiler stated that the NCWS program was not in a position to do this for the NTNCWSs at this time. Tom Murphy asked how does WaterTrack handle/track high lead results? Tom M said there is a truncation issue on the sample location name field. Dan acknowledged that this problem has been identified, and the Department of Technology Management and Budget (DTMB) has been trying to fix this problem, but it is a challenging problem. Dan stated that sample sites for NTNCWSs are actually identified by LHDs during the sanitary survey and are documented in the sanitary survey. The LHDs check the pdf of the laboratory results that clearly states where the sample was taken, and calculates the 90th percentile. However, Dan stated that the requirement to send in the lead and copper reporting form is not currently in the LHD annual monitoring letter sent to each system. The NTNCWSs do not couple this form to the Lead Consumer Notice, as does the CWSs. Kris Philip pointed out that the LHDs select the sample sites, thus when they are calculating the 90th percentile, they are actually double checking the sites with the results.

From our discussion, the Region concluded that at this time, the LHDs are actively reviewing the lead and copper results and the sample locations when they calculate the 90th percentiles to ensure proper LCR monitoring is conducted by ALL NTNCWSs at the proper sample sites. After our call, I asked for verification of this statement, and Dan Dettweiler

responded, "Just as with an exceeding value of an MCL, WaterTrack alerts the LHD when at least one sample for a water system exceeds the AL. A 90th percentile calculation is made only when an exceeding result alerts the LHD. For cases where there are no exceeding results, private lab samples are reviewed at the time LHDs hand-enter them into WaterTrack. State lab samples, which flow electronically via nightly downloads from the state lab database, are reviewed when pdfs of the analysis reports are, routinely, emailed by the state lab to LHDs. Beyond that, MDEQ's annual evaluation of the LHDs provides another opportunity for us to oversee the proper assigning and use of designated sampling locations."

ACTION: The Region will discuss Dan's response internally, and get back to the State with any issues/concerns.

Kris Philip said that the CWS program is requiring that the systems submit the form, but they are not enforcing whether or not the system submits the form. Often, the CWS will submit the Lead Consumer Notice and the Lead and Copper reporting form together. Kris said if 90%+ are already submitting the forms, then the State will agree to follow-up and enforce this requirement. But, if less than that, will probably be too much of a burden. Kris said they may change the way DEQ is tracking in SDWIS during FY 2016. But, the Region said SDWIS-Prime probably won't be available until 2017 at the earliest.

ACTION: Kris Philip will research with the District Offices to determine the current submittal rate of the lead and copper reporting form from CWSs; and report back to the Region.

2. Enforcement Update with Heather

NTNCWSs under Bottled Water agreements due to Arsenic MCL violations:
Per discussions with Region 5 and the February 2014 EPA/OECA memo, MDEQ has closed the old Arsenic open-ended MCL violations; however, no further quarterly monitoring is being conducted at the (±27) systems that are still under bottled water agreements. Thus, no more arsenic MCL violations will be reported for these systems and these systems will not become priority systems (ETT score of 11 or more) since only one arsenic MCL violation will be reported (5 points) even though they have a longstanding issue with arsenic noncompliance. The Region would like to discuss the pros and cons of placing these PWSs with arsenic MCL violations on quarterly monitoring as required under 40 CFR Section 141.23(c)(7); and brainstorm possible solutions.

Heather provided an update on how the State is doing in returning ETT systems to compliance; the State is doing very well in achieving its commitment for FY 2015. Heather said the Region is glad to see the State and LHD prioritization of implementation of the drinking water program and NTNCWS schools and daycares.
Referring to the NTNCWSs under BW agreements that are in violation of the Arsenic MCL, Heather said that since there are no more open-ended MCL violations in SDWIS, that no MCL violations can be reported to SDWIS unless there is monitoring to show the system is in non-compliance. Even though the LHD has indicated that these systems are drinking bottled water for public health protection, the use of bottled water cannot be a permanent solution to the fact that the system's drinking water at the tap continues to exceed the MCL for arsenic. Dan said there are 22 systems, where 8 are schools, that should be conducting quarterly monitoring. Dana said that letters have been sent (OR drafted?) to these 22 systems to require quarterly sampling for arsenic; these 22 systems are in 10 different counties so the message from the State is consistent. A secondary effect of this new requirement for the systems, may be that they transition to another water source or install treatment sooner.

The State voiced a concern that multiple quarterly violations could potentially affect the State's relationship with the LHDs financially. Genesee and Oakland Counties have quite a number of noncommunity water systems. Multiple quarterly violations could affect the Dept of Community Health's determination as to whether the LHDs are meeting their minimum program requirements; thus receive full funding for their work with the noncommunity systems for the drinking water program. The LHDs cannot have more than 20% of their systems with violations. The Region wonders how much funding would be cut from a LHD contract if it exceeds the 20% noncompliance level set in the contract?

3. Status of Flint

a. TTHM levels for May—Due to MDEQ district engineer June 10-RECEIVED; see link to results

https://www.cityofflint.com/2015/06/01/may-water-testing-results-show-all-locations-are-within-acceptable-limits-for-tthm/
All samples below the TTHM MCL; one site still has an LRAA above the MCL but decreased from 105 ppb in Feb to 93.5 ppb in May.

Mike Prysby said he is getting ready to issue the construction permit to the City of Flint to install a GAC filter in July, that will remove more TOC to further reduce the potential of developing TTHMs. Mike said he has already issued a construction permit for a transmission line within the City that will help reduce water age.

b. Lead in Flint

Our discussions with MDEQ indicate that no phosphates/corrosion control has been added to the system since April 2014 when the source of drinking water changed to the Flint River. We understand that the City is just finishing up its second set of 6-month initial monitoring for lead; where the results will probably warrant a Corrosion Control Study to be conducted. Since Flint has lead service lines, we understand some citizen-requested lead sampling is exceeding the Action Level, and the source of drinking water will be changing again in 2016, so to start a Corrosion Control Study now doesn't make sense. The idea to ask Flint to simply add phosphate may be premature; there are many other issues and factors that must be taken into account which would require a comprehensive look at the water quality and the system before any treatment recommendations can/should be made. Miguel is recommending MDEQ and EPA? approach Flint about formally requesting EPA's Office of Research and Development in Cincinnati support on the lead in Flint drinking water issue, and request that Mike Schock, ORD, and possibly Darren Lytle, ORD, to participate in Flint's drinking water advisory committee so that a comprehensive evaluation on how to proceed can be discussed.

Miguel provided a brief summary of the high lead results found at the residence of Ms. Leeanne Walters in Flint. Miguel will follow up with a written summary of the work conducted, sample results, and conclusions.
Miguel believes that lead levels in Flint are being affected by the lack of Corrosion Control being conducted by the City, since the LCR requires 2 6-month initial monitoring for a new source. Steve Busch stated that in the Lead sampling pool, almost all of the lead sample sites are lead service lines, and the State is not seeing large increases in lead levels at the tap. Miguel suggested that EPA experts in Lead, Mike Schock; and in distribution systems, Darren Lytle, be added to the Flint drinking water advisory committee to assist the City/State in determining the best way to proceed to minimize lead in the City's drinking water during the interim use of the Flint River, and subsequent use of Lake Huron water.

Miguel said he will send Mike Schock and Darren Lytle's contact information to Steve and Mike. Steve pointed out that the City is following the LCR requirements, and completing the requirements in a timely manner. Miguel's point is that since the LCR was promulgated 20+ years ago, that research and different situations, like Washington D.C., have educated scientists, experts, and regulators that the existing requirements in the LCR may not be as protective as previously thought. Thus, he can only make recommendations as to how to revise sampling protocols. And Miguel acknowledges that it may be another year before these regulation changes are promulgated in the Long-Term Lead and Copper Rule. In December 2015, the NDWAC recommendation is expected.

The Region asked the State if the Flint River will be a permanent supplemental source of drinking water, once the City of Flint connects with the Karegdodi pipeline from Lake Huron. Mike Prysby said that the City is currently pumping 22MGD, but the City has 40-50 MG of storage. The City is currently working on reducing its unaccounted for water losses, and these water losses are dropping. The State, through the Governor's office, provided disadvantaged system funding, $2M which includes $900K for lead detection, and pipe inspection.

4. Update on WaterTrack to SDWIS-State: The migration of WaterTrack data to SDWIS-State was number 39 on the Dept of Technology Management and Budget's (DTMB) project list last year; this year it is

number 30. It doesn't appear this project has a high priority. Does the State have any new information on the progress of this project?

Dan said that the migration of WaterTrack data to SDWIS-State has moved to a priority of 26 with DTMB so far this year. But Dan said they are going to take this project out of the que, since Ronda Page has returned to the drinking water program from DTMB. Ronda said she re-estimated DTMB's involvement in this project to be far less than originally thought, so there is no need for any program developers or the tech team. This project will only need the Data Team and the web designers only. Ronda said they can set-up on a new server and migrate the data from WaterTrack to SDWIS-State themselves; in-house. Kris Philip remembers migrating the CWS data to SDWIS-State, so she can be a resource for this project. The parts that are needed to be completed by DTMB could be contracted out. Cary McElhinney said that there is a process of withholding PWSS grant funds and re-directing the funds to a HQ contract with SAIC. Richard Benzie said the process worked well last year when MI used PWSS funds to contract with a HQ contractor to conduct NEEDS survey training.

ACTION: Jen will follow up with State and Tribal Programs Branch about the process and timing of holding back funds from the PWSS grant for the purpose of contracting with SAIC.

5. Consequences of cutting the State drinking water program to a "minimal program"

Jennifer had a discussion with Richard Benzie regarding the possibility of the Michigan State Legislature looking to have just a minimal drinking water program, meaning only a program with activities that are required by the Federal SDWA. Jennifer ultimately discussed this internally with Tom Poy. The minimal program suggested would cut out Operator Certification, Capacity Development, Plan Review, Cross Connection Control, Source Water Protection, among other programs that are State required. Operator Certification and Capacity Development, while not required by the Federal regulations, do have financial strings attached. And Plan review/construction permits are required by the SRF program for a loan. Any recent communication with the State Legislature that they might proceed and make this possibility a reality?

Richard and Liane said there is no current threat from the State Legislature to cut the State-funded PWSS program activities. But there is a State-wide impetus to delete old programs and regulations, so this could lead to questioning the purpose of State-funded PWSS program activities. Richard is just being proactive in preparing a justification. Richard remembers a discussion many years ago about what constitutes a "comprehensive drinking water program". Tom Poy and Jennifer commented in a previous communication with Richard that the EPA PWSS primacy program and the State-funded activities in the drinking water program were meant to complement each other. To support this statement, Jennifer sent Richard some PWSS Priority guidance from the 90's, some preamble language from the 1976 SDWA found by our attorney, and language from Section 142 of the SDWA regulations from 1976 that might assist him in his justification.

6. EPA's Resource Message at the LHD Workshop in April

From the 2014 analysis of Shared Goals 2013 data, which is compliance data, for noncommunity systems, there are increasing trends of nitrate M/R violations for both NTNCWSs and TNCWSs. We discussed this on the last semi-annual call. Analysis of the 2015 Shared Goals 2014 data (April 2015) shows an improvement—that of decreasing numbers of bacti/nitrate M/R violations.

However, in light of the upcoming implementation of RTCR in 2016, the question raised here in the Region is:

Does the State have a plan with the LHDs as to what activities must be prioritized, and what will fall off the plate? Not all LHDs will need to disinvest based upon each LHD's resources, but some poorly funded LHDs may have to disinvest in some activities/drop activities that have no risk to public health.

Carrie Monosmith said that she met with the RTCR workgroup, comprised of LHD Directors/sanitarians, last fall to identify activities that the state can disinvest in during the next several years as the LHDs begin implementation of RTCR. They could not identify any activity that could be dropped. The main thing that will help the LHDs save time is to get the electronic DWR (eDWR) going, or the CMD portal, which will drastically reduce the LHDs time in inputting laboratory data into WaterTrack/SDWIS-State. From there, they can develop electronic data forms (CROMEER compliant) that the systems can submit.

Thank you!

Jennifer

shekterl@michigan.gov; 'Richard Benzie' <benzier@michigan.gov>; 'kris philip' <philipk@michigan.gov>; 'Monosmith, Carrie (DNRE)' <MONOSMITHC@michigan.gov>; 'DeBruyn, Dana (DEQ)' <DebruynD@michigan.gov>; Dettweiler, Dan (DEQ) <DETTWEILERD@michigan.gov>; Poy, Thomas <poy.thomas@epa.gov>; Kuefler, Janet <kuefler.janet@epa.gov>; Damato, Nicholas <damato.nicholas@epa.gov>; Shoven, Heather <shoven.heather@epa.gov>; Murphy, Thomas <murphy.thomas@epa.gov>; Bair, Rita <bair.rita@epa.gov>; McElhinney, Cary <mcelhinney.cary@epa.gov>; Pniak, Edward <pniak.edward@epa.gov>; 'cookp@michigan.gov'; 'Prysby, Mike (DEQ)' <PRYSBYM@michigan.gov>; Busch, Stephen (DEQ) <BUSCHS@michigan.gov>

Rennaker, Joanne (DEQ)

From:	Rosenthal, Adam (DEQ)
Sent:	Friday, August 15, 2014 5:48 PM
To:	'bwright@cityofflint.com'; Mike Glasgow; djohnson@cityofflint.com
Cc:	Busch, Stephen (DEQ); Sygo, Jim (DEQ); Wurfel, Brad (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ); Prysby, Mike (DEQ); Joseph, Mark (DEQ); Skinker, Bethel (DEQ); Cook, Pat (DEQ)
Subject:	Flint - 02310 Fecal Positive / Boil order
Attachments:	PN Tier 1 - Fecal or E-coli Dist Sys.doc

Summary:
8/12/14 – 3 routine samples test positive for total coliform (TC), Cedar Reservoir, Site 4 & Site 5.

Free Chlorine was 0 and Total Cl around 0.1 ppm.

8/13/14 – 9 repeat samples collected, 7 TC positive & 1 fecal positive downstream of Site 4

Site 4 is a Taco Bell, downstream site is a repair shop with a questionable tap.

8/14/14 – 2nd set of 9 repeat samples collected, 8 repeats Non Detect and Site 4 TC positive (downstream site with the fecal positive was cleaned and is now non detect.) Chlorine has been increased and detected at 0.2 – 0.5 ppm Free Cl.

With the confirmed fecal positive, the MCL has been elevated to require a Tier 1 Public Notice to be issued within 24 hrs of notification. The DEQ is issuing a Boil Water Order to the affected area (Public Notice attached). A 2nd Tier 2 MCL PN may be necessary once the August monitoring period is complete and the situation is resolved.

The City of Flint has been instructed to issue the Tier 1 PN according to their Emergency Response Plan, flush the system, and collect 2 sets of 5 samples 24 hrs apart in the affected area before lifting the boil order.

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

DRINKING WATER WARNING

The City of Flint water is contaminated with fecal coliform
BOIL YOUR WATER BEFORE USING

Fecal coliform bacteria were found in the water supply on August 14, 2014. These bacteria can make you sick, and are a particular concern for people with weakened immune systems.

What should I do? What does this mean?

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 (affected area).

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

What happened? What is being done?

3 routine samples tested total coliform positive, repeat samples were also total coliform positive as well as 1 fecal coliform positive. We are increasing our chlorine levels and flushing the system. We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within a few days.

For more information, please contact Mr. Brent Wright of the City of Flint at 810-787-6537, bwright@cityofflint.com, 4500 North Dort Highway, Flint MI 48505. General guidelines on ways to lessen the risk of infection by microbes are available from the EPA Safe Drinking Water Hotline at 1(800) 426-4791.

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 DNRE.

Rennaker, Joanne (DEQ)

From:	Prysby, Mike (DEQ)
Sent:	Wednesday, January 23, 2013 10:01 AM
To:	Bloemker, Jon (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Subject:	Flint - Dept of Treasury

I spoke with Mr. Randy Byrne from the Dept. Treasury – Office of Fiscal Resp. concerning the Flint WTP. Below is a brief summary of our discussion. I can fill you on more details this afternoon just prior or immediately after our KWA meeting.

Q1: The city of Flint has considered using the Flint River as a source of drinking water to be treated at their WTP; however,

The city may be somewhat reluctant to use the river as their source, what is your assessment of this issue?

A: The city could utilize the Flint River ranging from 100% utilization – to a certain percent blending (either Detroit or KWA) or

zero percent utilization of the river. I agree that the city should have concerns of fully utilizing the Flint River (100%) for the following; the need to soften, the potential for more advanced treatment after next round of crypto monitoring, available capacity in Flint River at 100-year low flow, residuals management (disposal of lime sludge). As the percent utilization of the river decreases (blending options), the need for softening, residuals disposal, capacity issues do not pose as much of a concern.

Q2: When comparing the treatment of Lake Huron water vs. Flint River water, are more treatment chemicals needed to effectively treat the water?

A2: Flint river water will require a larger amount of primary coagulant (Ferric) due to poorer raw water quality than Lake Huron water. Also, a different type of primary coagulant (Alum) may be more suitable for the treatment of Lake Huron water. I can confirm that based on what the Detroit Lake Huron WTP uses. Also, since softening would need to be employed, treatment compounds including lime, soda ash, and carbon dioxide would be necessary.

Q3: If the city needed to borrow money to be able to operate full time (KWA or blending), does the DEQ offer funding via the DWRF?

A3: The city could apply for DWRF funding and their eligibility would be based upon how well they score in the overall DWRF ranking process. Also, the total amount of the loan and their ability to repay the loan would be considered.

Q4: Flint has put forth a significant capital investment over the past 10 years to maintain their WTP, is the condition of the WTP sufficient for full time treatment of raw water from Lake Huron ? Are the operators qualified to operate the WTP?

A4: The Flint WTP has demonstrated its ability to treat raw water (Flint River) and meet the drinking water standards based on quarterly test runs since 2009 and two pipeline emergencies that occurred in 2009 where water from the WTP was distributed to the city. Successful operation of the WTP on an intermittent basis is difficult. WTP operators face the constant challenge of maintaining WTP components in good working order while the plant is normally out of service over 90% of the time. The reliability of WTP and its components are better maintained through continuous operation. The operating experience and knowledge of the operators is also better established with full-time operation. WTP operators have the required operator certification and are very familiar with the operation of the Flint WTP, meeting drinking water standards, and troubleshooting operational problems. The Flint WTP is capable of meeting the drinking water standard if the plant was utilized to treat raw water from Lake Huron.

Q5: Do you see any weak links in the WTP or significant improvements if the WTP were to be fully utilized?

A5: I would not see any major treatment changes or additions needed if Lake Huron water was utilized; however, in order for the city to fully utilize its storage capacity, a pumping station would need to be added immediately after the WTP such that treated water can be pumped into the city's 20-Mgal Dort reservoir. In the current configuration, water from Detroit flows by gravity through this reservoir and then into the WTP's 3 Mgal reservoir followed by pumping via Pump Station No. 4 into the city's distribution system. Improvement in stand-by power may also be necessary. Finally, if a component of Flint River water were to be treated, then more advanced treatment based upon higher bin classification (UV disinfection, etc.) could be required based upon crypto. results.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, October 23, 2014 4:04 PM
To: janburgess52@comcast.net
Cc: Poy, Thomas; Howard, Donna; Prysby, Mike (DEQ); Busch, Stephen (DEQ); Porter, Andrea
Subject: Flint, Michigan Citizen complaint - Drinking water quality and Chloride levels

Dear Ms. Burgess: You stated below that GM is not using the treated Flint water anymore because of higher chloride levels, which is correct. If you read thru the article link that you sent me or the links below, the Michigan Dept of Environmental Quality (MDEQ) clarified that the higher chloride levels are most likely coming from the City's treatment of the Flint River water with Ferric Chloride, which acts as a coagulant to help remove suspended and dissolved solids and contaminants. A chloride is a salt compound resulting from the combination of the gas chlorine and a metal. As EPA explains (see: http://water.epa.gov/drink/contaminants/secondarystandards.cfm), chlorides cause corrosion.

The Secondary Maximum Contaminant Levels (SMCL) listed in the Federal regulations at 40 CFR 143.3, are levels of contaminants that represent reasonable goals for drinking water quality, and are not enforceable by the State or the Federal governments. The SMCL for chloride is 250 milligrams per liter (mg/L). The MDEQ reports that the chloride levels in the Flint drinking water are approx. 50-60 mg/L which are acceptable levels, based on the SMCL of 250 mg/L. However, it appears General Motors requires a source of water with chloride levels below 20 mg/L.

Chlorine reacts with water to create different species of compounds that serve as disinfectants and acts to oxidize viruses/bacteria, so chlorine is not the same as chloride.

http://www.mlive.com/news/flint/index.ssf/2014/10/gms_decision_to_stop_using_fli.html

http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html

Secondly, your email refers to the poor quality of the Flint drinking water. The source of drinking water for the City of Flint was changed from Detroit (which comes from Lake Huron) to the Flint River at the end of April this year. The Flint River raw water is a different quality than the Lake Huron raw water; and requires additional treatment to ensure an acceptable quality drinking water. The MDEQ has been working closely with the Operator-in-Charge at the Flint Water Treatment plant to ensure a palatable drinking water is provided to the citizens of Flint. Please note that the use of Flint River water as a source for your drinking water is an interim source; the City of Flint plans to connect to the Karegnondi Water Authority pipeline which will draw water from Lake Huron, in 2016.

The MDEQ is aware of the multiple complaints from citizens and is working closely with the Flint Water Department to ensure the distribution system and the water treatment processes work more efficiently and more effectively. For further information, you can contact Mike Prysby at:

Mike Prysby, District Engineer
Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance, Lansing District Office
P.O. Box 30242
Lansing, Michigan 48909-7742

(517) 290-8817
prysbym@michigan.gov

The most likely cause of the brown water (iron deposits and sediments from the very old cast iron pipes that make up the distribution system in Flint), is incorrect use of fire hydrants by demolition contractors in the area during this time. The fire hydrants are turned on for the contractors to use, and since the water is under pressure, the fast flow of the water scours the insides of the pipes, causing sediment and rust to become free floating. The City conducts this type of cleaning of the pipes in a regulated/controlled process, and requires at least ten minutes for all the sediment to be flushed out of the water main. However, the contractors do not always let the water flush for ten minutes, thus sediment remains in the water main. The City's flushing of the water mains should alleviate the sediment and brown water issues. You can contact the Flint Water Service Center to request that your lines be fully flushed.

Telephone numbers for you to call if you have further concerns:
Flint Water Service Center deals with problems in the distribution system: 810-766-7202
Water Treatment Plant deals with the actual treatment of the water prior to its pumping into the distribution system: 810-787-6537

If you have additional questions, please contact me at (312) 886-0244 or crooks.jennifer@epa.gov.

Jennifer Kurtz Crooks
Michigan Program Manager
Ground Water and Drinking Water Branch
United States Environmental Protection Agency, Region 5
77 West Jackson Blvd, WG-15J
Chicago, Illinois 60604
312.886.0244
crooks.jennifer@epa.gov

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: Chastity Pratt <cpratt@bridgemi.com>
Sent: Tuesday, January 27, 2015 4:17 PM
To: Busch, Stephen (DEQ)
Subject: Flint - one more question

Hi, Steve,
The city's website says the water is being monitored daily. When will the MDEQ next notify the public about the water quality?

--
Chastity Pratt Dawsey
Reporter
Bridge Magazine/The Center for Michigan
28 W. Adams Suite 330, Detroit, MI 48226
www.bridgemi.com
C: 313-310-7867

Rennaker, Joanne (DEQ)

From: Poy, Thomas <poy.thomas@epa.gov>
Sent: Monday, August 10, 2015 8:05 AM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Cc: Crooks, Jennifer
Subject: Flint

Liane: Any news on Flint since our call a couple of weeks ago? Has the letter been sent to inform them that they are not optimized for lead based on their monitoring? Have they been approached about starting corrosion control sooner rather than later?

Tom

Tom Poy
Chief, Ground and Drinking Water Branch
USEPA - Region 5
(312) 886-5991

Rennaker, Joanne (DEQ)

From: Philip, Kris (DEQ)
Sent: Wednesday, September 23, 2015 10:24 AM
To: Busch, Stephen (DEQ)
Cc: Rennaker, Joanne (DEQ)
Subject: Flint Baseline Info
Attachments: 02310_Flint_BaselineForm.pdf; BaselineLetterSW - 03 14 07.pdf; BaselineQA - 03 12 07.pdf

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

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

WSSN: 02310 FLINT

Check this box if the total capacity listed below is correct.
If the data is incorrect, leave this box blank and make the necessary correction below. ☑

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

Signature of water supply representative:

BRENT F. WRIGHT — Printed Name

OPS & TECH SUPERVISOR — Title

Signature

3-22-07 — Date

Please FAX or mail your completed form to:

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

FAX: (517) 241 - 1328

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

March 13, 2007

Dear Water Supply Professional:

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

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

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

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

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

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

Sincerely,

James K. Cleland

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

Enclosures

cc: Operator in Charge

Questions and Answers Regarding New Water Withdrawal Legislation & Baseline Capacity

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

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

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

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

(continued on reverse)

How might an inaccurate or no baseline capacity affect your public water supply?
The answer to this question is best exemplified by citing a hypothetical example. Suppose a water supply system (not necessarily a public water supply) is operating with an average water use of 1.2 million gallons per day (MGD) and a peak water use reported to the department in 2004 of 1.6 MGD. However, the sum of capacities for the system's well pumps is 1800 gpm, or 2.6 MGD. Unfortunately, the system fails to notify the MDEQ of their existing well pump capacity. Under the law, 1.6 MGD becomes the grandfathered baseline capacity instead of 2.6 MGD.

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

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

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

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

Rennaker, Joanne (DEQ)

From:	Prysby, Mike (DEQ)
Sent:	Wednesday, August 20, 2014 3:28 PM
To:	Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Willard, Veronica (DEQ); Kinney, Deana (DEQ)
Cc:	Rosenthal, Adam (DEQ)
Subject:	Flint BWA

Ron Fonger (Flint Journal) contacted me concerning the status of the BWA in the southwest portion of the Flint water distribution system. I informed Mr. Fonger, that the MDEQ is authorizing the city to rescind the BWA based upon the absence of total or fecal coliform bacteria from any of the samples (system-wide set) collected yesterday (Aug 19th) and from the affected area on Monday Aug. 18th. Mr. Fonger asked whether the city or the MDEQ has identified a cause to the contamination. I responded that a direct cause has not been identified. The water utility inspected both reservoirs and noted a one vent screen not totally intact; however, the inside of the reservoir did not appear compromised. The screen was repaired. The water utility is continuing to investigate other potential system anomalies including unprotected cross connections, nearby water distribution system repairs and/or loss of pressure, and un-authorized connections. I concluded that the MDEQ will be providing the city, as soon as possible, a standard notice to rescind the BWA.

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

Rennaker, Joanne (DEQ)

From: Robinson, Michael <MRobinson@wnj.com>
Sent: Saturday, February 01, 2014 10:50 AM
To: Busch, Stephen (DEQ)
Subject: Flint consent order addition

Steve, bond counsel for the City of Flint has indicated that we need to add to Section 2.2 of the consent order (it will be a new Section in your redraft) the following language at the end of that Section: "After five years COF must undertake a public improvement project to receive water from KWA or some source other than the Flint River in order to continue to use it's water treatment plant."
Mike

Rennaker, Joanne (DEQ)

From:	Rosenthal, Adam (DEQ)
Sent:	Monday, September 08, 2014 2:06 PM
To:	Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject:	Flint DBP data
Attachments:	Flint DPB OEL 2nd qtr 14.xlsx

data summary as requested.

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

City of Flint - 02310

Theoretical OEL based on 1st 2 quarters post Treatment Plant startup 2014

TTHM/ppm	DBP1	DBP2	DBP3	DBP4	DBP5	DBP6	DBP7	DBP8
	McDonalds	Liquor Palace	N. Flint Auto	University Market	B&P Gas Station	Salem Housing	Kroger	Taco Bell
DATE	3719 Davison Rd	822 S Dort Hwy	3302 S Dort Hwy	3606 Corunna	2501 Flushing	3216 MLK Blvd	5018 Clio Rd	6204 N Saginaw
5/21/2014	0.1624	0.1116	0.0965	0.1064	0.0751	0.0822	0.0882	0.0792
8/21/2014	0.1453	0.1120	0.1272	0.1813	0.1962	0.1124	0.1444	0.1183
Theoretical OEL based on 2 qtrs	0.113	0.084	0.088	0.117	0.117	0.077	0.094	0.079

HAA5/ppm	DBP1	DBP2	DBP3	DBP4	DBP5	DBP6	DBP7	DBP8
	McDonalds	Liquor Palace	N. Flint Auto	University Market	B&P Gas Station	Salem Housing	Kroger	Taco Bell
DATE	3719 Davison Rd	822 S Dort Hwy	3302 S Dort Hwy	3606 Corunna	2501 Flushing	3216 MLK Blvd	5018 Clio Rd	6204 N Saginaw
5/21/2014	0.0640	0.0520	0.0480	0.0550	0.0380	0.0410	0.0490	0.0500
8/21/2014	0.0430	0.0400	0.0310	0.0240	0.0170	0.0250	0.0300	0.0370
Theoretical OEL based on 2 qtrs	0.038	0.033	0.028	0.026	0.018	0.023	0.027	0.031

Theoretical OEL = (1st qtr + (2nd qtr x2))/4

Quarterly TOC in ppm

Date	Raw	Finished
5/22/2014	10.3	4.57
8/19/2014	8.48	4.06

City of Flint - 02310

Theoretical OEL based on 1st 2 quarters post Treatment Plant startup 2014

9/8/2014

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, February 27, 2015 1:44 PM
To: Busch, Stephen (DEQ)
Subject: Flint DBP MCL 1Q15
Attachments: Flint DBP MCL 1Q15.doc

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

DAN WYANT
DIRECTOR

March 2, 2015

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 R325.10719l, *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 acknowledge and appreciate the City's cooperation with our recommendation to preemptively conduct an Operational Evaluation following the City's second quarterly round of monitoring in August. That Operational Evaluation report has identified possible causes and corrective measures for the 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.

Our office is continuing to review the Operational Evaluation report that was submitted on December 1, 2014, 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 719l (R325.10719l) 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 May 31, 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 15, 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 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. Darnell Early, 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 sample results were all less than half the MCL, 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:	Rosenthal, Adam (DEQ)
Sent:	Friday, January 16, 2015 1:31 PM
To:	larry.f.elliott@abc12.com
Cc:	Prysby, Mike (DEQ); Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Subject:	Flint Disinfection By-Product data
Attachments:	Flint 2014 DBP results.PDF

Dear Mr. Elliott at ABC 12 Flint.

Attached are results and definitions for Disinfection By-Products samples collected during 2014 for the City of Flint. The Locational Running Annual Average (LRAA) is the number used for compliance with the Maximum Contaminant Levels (MCLs).

Sincerely,

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

Flint 2014 TTHM & HAA5 results and Locational Running Annual Average (LRAA) 1/16/15

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

HAA5 Results (mg/L)				
	5/21/14	8/21/14	11/20/14	LRAA
DBP1 McDonalds 3719 Davison	**0.064**	0.043	0.016	0.031
DBP2 Liquor Palace 3302 S. Dort Highway	0.052	0.031	0.015	0.025
DBP3 North Flint Auto 6204 N. Saginaw St.	0.048	0.037	0.018	0.026
DBP4 University Market 2501 Flushing Road	0.055	0.017	0.024	0.024
DBP5 Taco Bell 3606 Corunna Road	0.050	0.024	0.015	0.022
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.049	0.030	0.017	0.024
DBP7 Salem Housing 3216 MLK Boulevard	0.041	0.025	0.005	0.018
DBP8 BP Gas Station 822 S. Dort Highway	0.038	0.040	0.021	0.025

Locational running annual average (LRAA): the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

Maximum contaminant level (MCL): the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

The Stage 2 Disinfection By-Products Rule (DBPR) requires systems to meet an LRAA of 0.080 mg/L for TTHM and 0.060 mg/L for HAA5 at each compliance monitoring location.

Rennaker, Joanne (DEQ)

From:	Prysby, Mike (DEQ)
Sent:	Wednesday, September 10, 2014 2:15 PM
To:	'bwright@cityofflint.com'
Cc:	Busch, Stephen (DEQ)
Subject:	Flint Distribution System OEL
Attachments:	TTHM - OEL letter.pdf

Brent,

Attached is a compliance communication letter to the city of Flint confirming the two most recent rounds of TTHM/HAA5 monitoring. Based upon the sampling results, the city will need to proceed with an Operational Evaluation of the treatment and distribution operational practices in effort to minimize future exceedances.

The MDEQ will not be available to participate at tomorrow's 10am press conference. While the unexpected closure of the two transmission main valves may have exasperated a total coliform MCL violation– it may be pre-mature in pinpointing the closed valves as the source of the total coliform MCL. Did the closure of these valves create low pressure conditions in the affected area (<35psi – utilize hydraulic model to confirm) ? If low pressure, then any discovered cross connections – illegal connections – leaks – breaks could suggest contaminants entered the system. Low chlorine residuals due to longer transmission time (in part to the closed valves) would likely not provide adequate disinfection – especially in areas of tuberculation, biofilm, or phosphate coating on the interior pipe walls. Although the BWA is rescinded, please continue to investigate all of the other potential causes that Steve and I have provided.

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

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

DAN WYANT
DIRECTOR

September 10, 2014

Mr. Brent Wright
City of Flint Water Treatment Plant
4500 North Dort Highway
Flint, Michigan 48505

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 x current quarter + sum of 2 previous quarters) divided by 4

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

(2 x current quarter + previous quarter) 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. In addition, the City's two other sites are both more than 95% of the TTHM OEL limit.

The 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 (R325.10719i). 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 United States Environmental Protection Agency's (U.S. EPA) Operational Evaluation Guidance Manual. This document is available on the U.S. 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 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.
District Engineer
Office of Drinking Water and
Municipal Assistance
Lansing District Office
(517) 290-8817

cc: Mr. Darnell Early, City of Flint
Mr. Daugherty Johnson III, City of FLint
Mr. Howard Croft, City of Flint
Mr. Robert Bincsik, City of Flint
Ms. Liane Shekter Smith, P.E., DEQ
Mr. Richard Benzie, P.E., DEQ
Mr. Stephen Busch, P.E., DEQ
Genesee Co. Health Dept.

Rennaker, Joanne (DEQ)

From: Tommasulo, Karen (DEQ)
Sent: Friday, September 18, 2015 4:31 PM
To: Pallone, Maggie (DEQ); Busch, Stephen (DEQ)
Subject: Flint documents
Attachments: FlintWater.pdf

Here's what Lisa came up with for Monday (in addition to the edited FAQ Brad sent around earlier). I'm not sure Brad is happy with the infographic, so consider that part optional. But the four quadrants of responsibility looks nice.

Thoughts?

Karen Tommasulo
Public Information Officer
Michigan Department of Environmental Quality
517-284-6716 | 517-599-5733
tommasulok@michigan.gov

DRINKING WATER - LEAD - DISTRIBUTION OF RESPONSIBILITIES

Environmental Protection Agency

1. Promulgation of Federal Safe Drinking Water Act Rules
2. 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
3. Granting Primacy of Federal Regulations to States
4. Auditing of State Public Water Supply Programs
5. Provide Funding to States

Michigan Department of Environmental Quality

1. Primacy - Michigan Safe Drinking Water Act and Administrative Rules
2. Oversight of public water systems
3. Inspections
4. Construction Permitting
5. Provide loans to water systems for public infrastructure improvements
6. State Laboratory Services
7. Laboratory Certification
8. Establish monitoring requirements, quantity and frequency
9. Verification of monitoring results and compliance determination
10. Notify water systems of Action Level Exceedance
11. Establish Water Quality Parameter Ranges, as necessary
12. State Reporting to EPA
13. Operator Training and Certification

City of Flint Water Customers

1. Certified Operation of public water system
2. Establish Water Rates
3. Obtain construction permits
4. Reporting to MDEQ
5. 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
6. Provide Annual Report (CCR) to all customers
7. Conduct Water Quality Parameter Monitoring
8. Recommend and Install Optimized Corrosion Control Treatment
9. Provide Public Notification, as necessary
10. Replace public portion of lead service, as necessary

Water Customers

1. Participate in lead sampling as requested
2. Request lead testing if concerned
3. Follow lead sampling Instructions
4. Provide signed information on how sample was collected
5. Review individual result material
6. Follow instructions for reducing lead exposure
7. Replace private leaded service line and plumbing materials with lead-free products
8. Obtain plumbing permits and comply with code requirements
9. Pay Water Bills
10. Read Annual Report (CCR)
11. Read and follow Public Notification materials

005712

flint's WATER SYSTEM

Service area

34

SQUARE MILES

Public water mains

550+ MILES

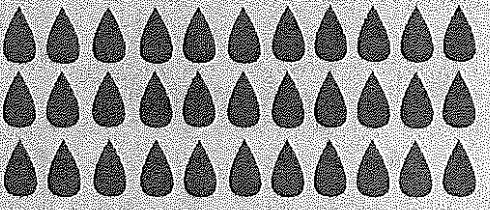
Public water mains that are 75+ years old

250+ MILES

Total service connections:

32,900

= 1,000



Service connections that are lead:

~15,000

Lead and copper sampling (6-month period)

COMPLETED: January 2015
QUANTITY: 100 samples
RESULTS: 90th percentile = 6 ppb

COMPLETED: July 2015
QUANTITY: 69 samples
RESULTS: 90th percentile = 11 ppb

on the horizon

JANUARY 2016: Flint plans to have optimized corrosion control treatment operational

JULY 2016: Flint plans to connect to Karegnondi Water Authority (which will bring in drinking water from Lake Huron)

DEQ 09/2015

Rennaker, Joanne (DEQ)

From: Pallone, Maggie (DEQ)
Sent: Tuesday, September 29, 2015 4:26 PM
To: Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Busch, Stephen (DEQ); Tommasulo, Karen (DEQ)
Cc: Feuerstein, Heather (DEQ); Sygo, Jim (DEQ)
Subject: Flint Drinking Water Action Plan
Attachments: Flint Drinking Water Action Plan.docx

12 point plan attached, along with update participants in the press conference.

Flint Update 9/29

Issues:

- DWSD switch
- Emergency Declaration
- Edwards issue
- Testing protocols

Flint Drinking Water Action Plan

1. **Governor Snyder names Dr. Eden Wells as Flint drinking water Public Health Advisor.**

   Action to date: Dr. Wells has been brought in and is reviewing the Hurley Health information.

2. **All Flint schools water (public, charter and parochial) will immediately be tested to ensure that drinking water is safe.**

   Action to date: Phone call with Superintendent and Facilities manager to identify schools. Phone call with Genesee County Public Health, DEQ and Flint schools afternoon of 9/29 to discuss testing protocols and timeline. DEQ has volunteered to pay for testing.
   Checking with MDE on fund availability to replace lead lines if they are identified in the testing.

3. **Advisories will be disseminated recommending citizens flush your cold water pipes, use only water from the cold water tap for drinking, cooking and especially for making baby formula.**

   Action to date: This step has already started to occur.

4. **Convene a safe drinking water "Technical Advisory Committee" to ensure best technology, practices and science is being utilized, including EPA's expertise and assistance from their Office of Research and Development.**

   Action to date: Committee will meet October 7. EPA will have Tom Burke, who heads up EPA's Office of Research and Development, participate on the Committee.

5. **Implementation of fully optimized corrosion controls in the Flint drinking water system.**

   Action to date: Technical Advisory Committee is meeting October 7 to recommend this. Flint will submit permit application to DEQ October 8. Corrosion control will begin by end of October.

6. **Expanded water testing of at risk properties.**

   Action to date: EPA and DEQ have a conference call at 1:45 PM 9/29 to discuss additional testing locations and protocols.

7. **Offer water testing at no cost to Flint residents to assure water is safe.**

   Action to date: City is already offering. DEQ will be discussing cost issues with the City.

8. **Offer premixed formula if test results indicate high levels of lead.**

   Action to date: DHHS evaluating.

9. **Accelerate water system improvements to address replacement of lead service lines.**

   Action to date: EPA has indicated that federal Drinking Water Revolving Loan money can be used to replace private service lines. State law needs to be changed to allow this to occur.

10. **Provide filters to residences of Flint.**

    Action to date: Ananich has indicated United Way would supply some. Harvey to follow up with Meijer.

11. **Expedite Completion of KWA.**

    Action to date: DEQ had initial conversation with Drain Commissioner to indicate help in moving any remaining permits.

12. **Facilitate conversation between the City of Flint and DSWD.**

Next Steps:

Press Conference in Flint - Friday, October 2, 1:30
Kettering University (exact room TBD)

Participants
Governor/ Lt. Governor
Harvey Hollins – Governor's office
Dan Wyant – Michigan Department of Environmental Quality
Nick Lyon – Department of Community Health
Dr. Eden Wells- Department of Community Health
Susan Hedman – Region 5 Administrator or EPA
Jamie Curtis- Chair, Genesee County Board of Commissioners
Jeff Wright- Genesee County Drain Commissioner
Local Public Health Department
Mayor of Flint

Rennaker, Joanne (DEQ)

From: Howes, Sarah (DEQ)
Sent: Tuesday, March 17, 2015 12:38 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Tommasulo, Karen (DEQ)
Subject: Flint Drinking Water Letter?

Hi all---

I just got a call from Rep. Neeley's office and it's their understanding that DEQ will be issuing a letter on Flint Drinking Water tomorrow. Is this true? If so, could you please PDF me a copy and I'll distribute to the legislative offices that have asked for updates when appropriate.
Thanks,
Sarah

Sarah M. Howes | Legislative Liaison
Department of Environmental Quality
517.284.6707 O | C 517.282.9204

Rennaker, Joanne (DEQ)

From: Howes, Sarah (DEQ)
Sent: Tuesday, September 08, 2015 12:29 PM
To: senjananich@senate.michigan.gov; 'SheldonNeeley@house.mi.gov'; 'repphelps@house.mi.gov'
Cc: DEQ-Legislative-Contact; Pallone, Maggie (DEQ); Busch, Stephen (DEQ)
Subject: Flint Drinking Water TTHM Standard
Attachments: Flint-TTHM-Compliance.pdf

Senator Ananich and Representatives Neeley and Phelps,

Attached is a letter that was mailed to the City of Flint on September 2nd, 2015 regarding the return to compliance with the drinking water standard for the disinfection byproduct, total trihalomethane. Compliance with the standard has now been achieved at all 8 of the City's compliance monitoring locations based on monitoring in August 2015.

Please feel free to contact Steve Busch with DEQ at 517-643-2314 with any questions.
Thanks,
Sarah

Sarah M. Howes | Legislative Liaison
Department of Environmental Quality
517.284.6707 O | C 517.282.9204

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

DAN WYANT
DIRECTOR

September 2, 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: City of Flint – Water Supply
Return to Compliance Total Trihalomethanes (TTHM)
3rd 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) has returned to compliance with the Michigan 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 Administrative Rule 610 (R 325.10610, *MCLs for disinfection byproducts*), the MCL for the disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L). Compliance is determined based on a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the LRAA all eight of the City's TTHM compliance sampling sites now comply with this standard based on the last four quarterly monitoring periods, ending August 31, 2015. This return to compliance regarding TTHM's began on September 1, 2015, and will continue as long as the LRAA at each of the City's TTHM compliance sampling sites remain below this standard.

TTHM Results (mg/L)						
	11/20/14	2/17/15	5/18/15	8/18/15	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.059	0.0162	0.0514	0.0755	0.050	0.055
DBP2 Liquor Palace 3302 South Dort Highway	0.033	0.0168	0.0635	0.0532	0.042	0.047
DBP3 North Flint Auto 6204 North Saginaw St.	0.041	0.0149	0.0452	0.0426	0.036	0.036
DBP4 University Market 2501 Flushing Road	**0.094**	0.0245	0.0598	0.0706	0.062	0.056
DBP5 Taco Bell 3606 Corunna Road	0.034	0.0151	0.0547	0.0619	0.042	0.049
DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.054	0.0192	0.0605	0.0595	0.048	0.050
DBP7 Salem Housing 3216 MLK Boulevard	0.050	0.0285	0.0727	**0.0903**	0.060	0.070
DBP8 BP Gas Station 822 South Dort Highway	0.036	0.0199	0.0461	0.0549	0.039	0.044

Corrective measures by the City have been successful in achieving compliance with this standard. These measures have included replacement of anthracite filter media with granular activated carbon as well as the optimization of water treatment plant and distribution system processes and operations as recommended through Operational Evaluations conducted by the City. It is important that the City continue to follow these recommendations in order to limit disinfection byproduct formation and maintain compliance with the MCL LRAA standards. While the MCL LRAA standard has now been met at all eight compliance sampling sites, an individual TTHM concentration above 0.080 mg/L was measured at one location, DBP 7, during peak month sampling in August 2015.

The DEQ encourages the City to continue informing customers about this updated water quality information and compliance with the TTHM MCL standard.

If you have any questions regarding this letter, please contact us at the numbers below; at prysbym@michigan.gov; or rosenthala@michigan.gov.

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

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 Glascow, City of Flint
Genesee County Health Department
Mr. Stephen Busch, DEQ

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Monday, January 12, 2015 1:06 PM
To: lwalters313@gmail.com
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint drinking water-citizen 2

Dear Ms. Walters: The names of the engineers at the Michigan Dept of Environmental Quality (MDEQ) that regulate the Flint drinking water supply are:

Steve Busch, Supervising District Engineer
517-643-2314
buschs@michigan.gov

Mike Prysby, District Engineer
517-290-8817
prysbym@michigan.gov

The Water Service Center in Flint deals with problems in the distribution system: 810-766-7202
The Water Treatment Plant in Flint deals with the actual treatment of the water prior to its pumping into the distribution system: 810-787-6537

The cloudiness in the water can be from other components of the drinking water, not necessarily from regulated contaminants. But, the laboratory analyses can give an indication what is causing the cloudiness in the water.

Jennifer Kurtz Crooks
DWSRF Set-aside Coordinator, Region 5
U.S. EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604
crooks.jennifer@epa.gov
312-886-0244

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Monday, January 12, 2015 12:50 PM
To: supersteely77@gmail.com
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint drinking water-citizen

Dear Mr. Martin: The names of the engineers at the Michigan Dept of Environmental Quality (MDEQ) that regulate the Flint drinking water supply are:

Steve Busch, Supervising District Engineer
517-643-2314
buschs@michigan.gov

Mike Prysby, District Engineer
517-290-8817
prysbym@michigan.gov

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Jennifer Kurtz Crooks
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U.S. EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604
crooks.jennifer@epa.gov
312-886-0244

Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Saturday, June 13, 2015 12:52 PM
To: Prysby, Mike (DEQ)
Cc: Busch, Stephen (DEQ); Cook, Pat (DEQ); Matta, Samir; Green, Warren; Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com
Subject: Flint GAC 1 of 2
Attachments: GAC-basis-of-design.pdf

Mike,

Attached is our revised basis of design. I am going to send preliminary drawings in a separate email due to file sizes.

Thanks,

Jeffrey R. Hansen
Senior Project Manager

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B • Flint, MI 48532
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BASIS OF DESIGN
FILTER MEDIA REPLACEMENT WITH GRANULAR ACTIVATED CARBON (GAC)
CITY OF FLINT

1. GENERAL DESCRIPTION

As one measure to assist with the reduction of total trihalomethanes (TTHM) in the water system the City of Flint (City) proposes to replace the existing anthracite media with GAC for each of the 12 filters within the water treatment plant (WTP). Two layers of media were installed in the filters in 2005: 12" of sand and 18" of anthracite. Recent investigations have shown that the sand installed does not meet the original design specifications and some intermixing of sand and anthracite has occurred. Consequently, replacement of the sand layer for all 12 filters is also proposed.

It is anticipated that the GAC media will be biologically active and chlorine feed prior to filtration can adversely affect the GAC. Therefore, the intermediate chlorine feed point is proposed to be moved to the weir chamber immediately downstream of the filters. The existing chlorine piping and diffuser upstream of the filters will remain in place for future use either for disinfection of the filters if necessary or for general disinfection if/when the KWA supply is available and GAC media is no longer needed in terms of TTHM control.

Relevant design information is provided in this narrative and detailed calculations follow.

2. DESIGN CRITERIA

The Flint WTP began full time operation using the Flint River on April 25th, 2014. The following information was taken from monthly operating reports (MOR's) for the full year from May 2014 through April 2015:

A. Average daily demand (ADD) = 18.3 MGD
B. Maximum daily demand (MDD) = 25.4 MGD
C. Minimum monthly average chlorine feed at intermediate point = 1.8 mg/l
D. Average monthly chlorine feed at intermediate point = 2.9 mg/l
E. Average plant effluent pH = 7.8
F. Maximum monthly average plant effluent pH = 8.1

Selected WTP design flow = 24 MGD
Maximum WTP flow expected = 30 MGD
Minimum WTP flow expected = 8 MGD

3. MEDIA DESIGN

A. GAC Media

- 18" depth
- GAC media selected is Filtrasorb 400 manufactured by Calgon Carbon Corporation with an effective size of 0.65 mm, uniformity coefficient of 1.90 and specific gravity of 1.40.
- The Filtrasorb 400 characteristics vary slightly from Ten State Standards (TSS) which state an effective size of 0.45-0.55 mm and a maximum uniformity coefficient of 1.65. However, it is somewhat unclear if TSS apply

to GAC as a capping layer. Also, the Filtrasorb 400 does meet the AWWA standard B604-12 for Granular Activated Carbon.

- When the GAC adsorptive capacity is spent, the media will act strictly as a filtering media. The hope is that the KWA supply will be active by the time GAC adsorption is limited. However, Calgon has agreed to test the GAC capacity quarterly after installation for 1 year to evaluate performance and future need to regenerate or replace the GAC.

B. Sand Media

- 12" depth
- Sand media shall have effective size of 0.50 mm, uniformity coefficient of 1.65 or less, and specific gravity of 2.5 or greater.

C. Dual Media Performance

- Sand settling velocity greater than GAC settling velocity
- D90 of GAC / D10 of sand < 4.0 to avoid excessive intermixing
- Adequate expansion of both medias during backwash without media loss
- Combined head loss of proposed medias less than combined head loss of existing sand and anthracite

4. INTERMEDIATE CHLORINE FEED

The new chlorine feed point will be within the first bay of the weir chamber. In order to avoid stripping of chlorine as the water cascades over the weir, a submerged drop pipe will be installed that outlets on the downstream side of the weir wall. Chlorine will be injected into this drop pipe. Contact time will begin in the second bay of the weir chamber.

CITY OF FLINT WTP
Filter Media Replacement
Basis of Design

					Notes
Max. Expected Flow Rate =	30.0	mgd =	20,833	gpm = 2,785 cfl/min	
Max. Day May 2014 - April 2015 =	25.4	mgd =	17,639	gpm = 2,358 cfl/min	
Avg. Day May 2014 - April 2015 =	18.3	mgd =	12,708	gpm = 1,699 cfl/min	
Design Flow Rate =	24.0	mgd =	16,667	gpm = 2,228 cfl/min	
Min. Expected Flow Rate =	8.0	mgd =	5,556	gpm = 743 cfl/min	
Area / Filter =	700	sft			
Number of Filters =	12				

mgd	30.0	24.0	8.0
Loading (gpm/sft) =	2.48	1.98	0.66

Top of Underdrain elev =	723.58				
Washwater Trough Weir elev =	730.67				
Operating Water Level =	734.00				
Top of Filter Basin / Floor elev =	736.00				
Filter BW Dimensional D =	7.08				
Existing Sand D =	12.00	inches =	1.00	ft	
Existing Anthracite D =	18.00	inches =	1.50	ft	
Proposed Sand D =	12.00	inches =	1.00	ft	
Proposed GAC D =	18.00	inches =	1.50	ft	See following pages for details
Proposed Water Depth =			7.92	ft	
Max Cold BW Flow rate / filter =	7910	gpm =	11.3	gpm/sft	To match current BW flow rate
Max Warm BW Flow rate / filter =	11900	gpm =	17.0	gpm/sft	Use when water temp > 65 degrees
Max Sand Expanded D =	14.2	inches =	1.18	ft = 18%	Occurs at cold temps
Max GAC Expanded D =	45.10	inches =	3.76	ft = 150%	
Total BW Expanded D =	59.30	inches =	4.94	ft	
Proposed BW Freeboard =			2.14	ft	
Proposed # of Filters to Replace	12				
GAC Volume =	12,600	cft			
GAC apparent density =	33.7	lbs/cft			
GAC Total Weight =	424,620	lbs =	212.3	tons	

mgd	30.0	24.0	8.0
EBCT (min) =	4.5	5.7	17.0

Propose to relocate intermediate chlorine feed to inlet side of weir chamber following filtration
Intermediate CL2 feed point to remain in place as means to disinfect filters in the future, if needed

mgd	30.0	24.0	8.0	
Contact time (min) =	33.0	43.7	131.2	
CT =	59.5	78.7	236.1	Calculations attached separately

Required CT at 1.8 mg/l chlorine, less than 0.5 degrees C, and pH of 8.0 = 56 OK

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

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis 2015 1st Stage

Date: 06/03/15

By: JRH

Data Entry:

WATER INPUT DATA	
Backwash Rate (gpm/sf)	11.3
Water Temperature (F°)	32
Viscosity (centipoise)	1.79355
Dynamic Viscosity (# -sec/sf)	3.746E-05
Water Density (#/cf)	62.42
Mass Density (# -sec/ft^4)	1.940

COMMENTS

SITE LOCATION	10 States		Filtrasorb 400		Filtrasorb 300		300/400 Mix		New sand / 300		New sand / 400	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	New sand	GAC	New sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.90	2.30	2.10	2.30	1.925	1.70	2.10	1.65	1.90
Effective Size (mm)	0.400	0.550	0.40	0.625	0.40	0.800	0.40	0.670	0.65	0.900	0.50	0.650
d60% Size (mm)	0.920	0.908	0.920	1.188	0.920	1.680	0.920	1.290	1.105	1.890	0.825	1.235
d90% Size (mm)	1.607	1.269	1.607	1.826	1.607	2.762	1.607	2.000	1.577	3.107	1.154	1.899
Porosity	0.40	0.50	0.40	0.614	0.40	0.586	0.40	0.55	0.40	0.586	0.40	0.586
Specific Gravity	2.554	1.45	2.554	1.40	2.554	1.40	2.554	1.45	2.500	1.40	2.500	1.40
Media Density (#/cf)	159.4	90.5	159.4	87.4	159.4	87.4	159.4	90.5	156.0	87.4	156.0	87.4
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.12	7.03	5.87	7.03	4.05	9.49	7.27	5.57	3.35
Reynolds Number	2.447	0.734	2.447	1.403	2.447	3.731	2.447	1.978	3.968	5.201	1.741	1.567
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.12	7.03	5.87	7.03	4.05	9.49	7.27	5.57	3.35
Unhindered Settling Vel. (ft/sec)	20.68	6.20	20.68	11.85	20.68	31.53	20.68	16.71	33.53	43.95	14.71	13.24
Expansion Coefficient (n)	3.287	3.708	3.287	3.475	3.287	3.151	3.287	3.358	3.132	3.048	3.401	3.437
Bed Porosity Coefficient (k)	142.82	27.92	142.82	17.00	142.82	31.61	142.82	30.16	167.27	37.07	125.75	21.03
Porosity (expanded)	0.462	0.784	0.462	0.889	0.462	0.721	0.462	0.747	0.423	0.677	0.492	0.835
Bed Depth Expanded (in)	13.4	41.6	13.4	62.7	13.4	26.8	13.4	32.0	12.5	23.1	14.2	45.1
% Expanded Bed	11.6	131.0	11.6	248.3	11.6	48.6	11.6	77.5	4.0	28.3	18.2	150.3
d90gac/d10s Ratio	3.173		4.564		6.905		5.001		4.780		3.797	
Discussion/Notes									Use 18.2 gpm/sft BW		Use 11.3 gpm/sft BW	

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

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation
Filter Media Analysis 2015 1st Stage

Date: 06/03/15
By: JRH
Data Entry:

WATER INPUT DATA	
Backwash Rate (gpm/sf)	17.0
Water Temperature (F°)	80
Viscosity (centipoise)	0.86134
Dynamic Viscosity (# -sec/sf)	1.799E-05
Water Density (#/cf)	62.22
Mass Density (# -sec/ft^4)	1.927

COMMENTS

SITE LOCATION	10 States		Filtrasorb 400		Filtrasorb 300		300/400 Mix		New sand / 300		New sand / 400	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	New sand	GAC	New sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.90	2.30	2.10	2.30	1.93	1.70	2.10	1.65	1.90
Effective Size (mm)	0.400	0.550	0.400	0.625	0.400	0.800	0.400	0.670	0.650	0.900	0.500	0.650
d60% Size (mm)	0.920	0.908	0.920	1.188	0.920	1.680	0.920	1.290	1.105	1.890	0.825	1.235
d90% Size (mm)	1.607	1.269	1.607	1.826	1.607	2.762	1.607	2.000	1.577	3.107	1.154	1.899
Porosity	0.40	0.50	0.40	0.61	0.40	0.586	0.40	0.550	0.40	0.59	0.40	0.59
Specific Gravity	2.554	1.45	2.554	1.40	2.554	1.40	2.554	1.45	2.500	1.40	2.500	1.40
Media Density (#/cf)	159.4	90.5	159.4	87.4	159.4	87.4	159.4	90.5	156.0	87.4	156.0	87.4
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	5.98	13.38	11.24	13.38	7.75	18.07	13.92	10.62	6.42
Reynolds Number	9.640	2.905	9.640	5.556	9.640	14.781	9.640	7.829	15.633	20.604	6.858	6.206
Correction Factor	1.000	1.000	1.000	1.000	1.000	0.853	1.000	1.000	0.840	0.779	1.000	1.000
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	5.98	13.38	9.59	13.38	7.75	15.18	10.85	10.62	6.42
Unhindered Settling Vel. (ft/sec)	81.46	24.55	81.46	46.95	81.46	124.90	81.46	66.16	132.10	174.11	57.95	52.44
Expansion Coefficient (n)	2.866	3.231	2.866	3.028	2.866	2.746	2.866	2.926	2.731	2.656	2.965	2.995
Bed Porosity Coefficient (k)	184.94	38.40	184.94	26.18	184.94	41.60	184.94	44.59	185.36	44.89	160.68	31.81
Porosity (expanded)	0.435	0.777	0.435	0.867	0.435	0.722	0.435	0.719	0.417	0.694	0.469	0.811
Bed Depth Expanded (in)	12.7	40.4	12.7	52.3	12.7	26.8	12.7	28.9	12.3	24.3	13.6	39.5
% Expanded Bed	6.2	124.3	6.2	190.5	6.2	48.9	6.2	60.3	2.9	35.2	13.0	119.3
d90gac/d10s Ratio	3.173		4.564		6.905		5.001		4.780		3.797	
Discussion/Notes									Use 20 gpm/sft BW		Use 16.5-17 gpm/sft BW	

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

CITY OF FLINT WTP

CT CALCS
TIME FROM FILTERS EFFLUENT TO 1ST TAP

Label	Location	Diameter in	Diameter ft	L ft	W ft	D ft	Bottom elev	Vol cft	Flow Rate mgd	Flow Rate cft/s	Baffle Factor	Time min	Velocity fps	Flow Rate mgd	Flow Rate cft/s	Time min	Flow Rate mgd	Flow Rate cft/s	Time min
A	Weir chamber, pre-baffle			26.75	13.08	15.5	709.00	5423	30.0	46.4	1.0		#DIV/0!	24.0	37.1	2.43	8.0	12.4	7.30
B	Weir chamber, post-baffle			26.75	8.5	10.0	709.00	2274	30.0	46.4	1.0	0.82	0.55	24.0	37.1	1.02	8.0	12.4	3.06
	Effluent pipe																		
C	wc - bldg face	48	4.00	16.00				201	30.0	46.4	1.0	0.07	3.69	24.0	37.1	0.09	8.0	12.4	0.27
D	bldg face - junct well	48	4.00	401.00				5039	30.0	46.4	1.0	1.81	3.69	24.0	37.1	2.26	8.0	12.4	6.79
	Res. 3																		
E	Junct well			12.00	18.00	15.0	704.00	3240	30.0	46.4	0.50	0.58	0.34	24.0	37.1	0.73	8.0	12.4	2.18
F	Clear well			140.00	177	10.0	709.00	247,800	30.0	46.4	0.30	26.69	0.09	24.0	37.1	33.37	8.0	12.4	100.10
G	Transfer chamber			7.00	55.25	15.0	704.00	5,801	30.0	46.4	0.50	1.04	0.11	24.0	37.1	1.30	8.0	12.4	3.91
H	Suction well			9.00	25.75	15.0	704.00	3,476	30.0	46.4	0.50	0.62	0.24	24.0	37.1	0.78	8.0	12.4	2.34
	Pump																		
I	Suction pipe	36	3.00	12.00				85	30.0	46.4	1.0	0.03	6.57	24.0	37.1	0.04	8.0	12.4	0.11
J	Discharge pipe	30	2.50	20.00				98	30.0	46.4	1.0	0.04	9.46	24.0	37.1	0.04	8.0	12.4	0.13
K	Dis. pipe (to bldg face)	42	3.50	34.00				327	30.0	46.4	1.0	0.12	4.82	24.0	37.1	0.15	8.0	12.4	0.44
	Finish main 1																		
L1	bldg face - 1st tee	42	3.50	208.00				2001	30.0	46.4	1.0	0.72	4.82	24.0	37.1	0.90	8.0	12.4	2.69
M1	tee - WTP tap	42	3.50	223.00				2146	30.0	46.4	1.0	0.77	4.82	24.0	37.1	0.96	8.0	12.4	2.89
N1	WTP tap - bldg face	12	1.00	19.00				15	30.0	46.4	1.0	0.005	59.10	24.0	37.1	0.01	8.0	12.4	0.02
	Subtotal											1.49				1.87			5.60
	Finish main 2																		
L2	bldg face - 1st tee	42	3.50	73.00				702	30.0	46.4	1.0	0.25	4.82	24.0	37.1	0.32	8.0	12.4	0.95
M2	tee - 1st split	42	3.50	277.00				2665	30.0	46.4	1.0	0.96	4.82	24.0	37.1	1.20	8.0	12.4	3.59
	Subtotal											1.21				1.51			4.53
							Total CT time		@ 30 mgd =			33.0		@ 24 mgd =		43.7	@ 12 mgd =		131.2

	2014								2015							
Month	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr		Min	Avg	Max
Cl2	5.0	4.7	3.9	3.3	3.1	2.5	2.0	1.8	1.8	2.1	2.4	2.0		1.8	2.9	5.0
pH	7.37	7.48	7.62	7.78	7.82	7.71	7.87	8.07	7.74	7.84	7.89	7.83		7.4	7.8	8.1

Flow (mgd)	30.0	24.0	8.0
CT =	59.5	78.7	236.1

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

Table C-1. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 0.5°C or Lower

CHLORINE CONCENTRATION	pH<=6 Log Inactivation						pH=6.5 Log Inactivation						pH=7.0 Log Inactivation						pH=7.5 Log Inactivation					
(mg/L)	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
<=0.4	23	46	69	91	114	137	27	54	82	109	136	163	33	65	98	130	163	195	40	79	119	158	198	237
0.6	24	47	71	94	118	141	28	56	84	112	140	169	33	67	100	133	167	200	40	80	120	159	199	239
0.8	24	48	73	97	121	145	29	57	86	115	143	172	34	68	103	137	171	205	41	82	123	164	205	246
1	25	49	74	99	123	148	29	59	88	117	147	176	35	70	105	140	175	210	42	84	127	169	211	253
1.2	25	51	76	101	127	152	30	60	90	120	150	180	36	72	108	143	179	215	43	86	130	173	216	259
1.4	26	52	78	103	129	155	31	61	92	123	153	184	37	74	111	147	184	221	44	89	133	177	222	266
1.6	26	52	79	105	131	157	32	63	95	126	155	189	38	75	113	151	188	226	46	91	137	182	228	273
1.8	27	54	81	108	135	162	32	64	97	129	161	193	39	77	116	154	193	231	47	93	140	186	233	279
2	28	55	83	110	138	165	33	66	99	131	164	197	39	79	118	157	197	236	48	95	143	191	238	286
2.2	28	56	85	113	141	169	34	67	101	134	169	201	40	81	121	161	202	242	50	99	149	198	248	297
2.4	29	57	86	115	143	172	34	68	103	137	171	205	41	82	124	165	206	247	50	99	149	199	248	298
2.6	29	58	88	117	146	175	35	70	105	139	174	209	42	84	126	168	210	252	51	101	152	203	253	304
2.8	30	59	89	119	148	178	36	71	107	142	178	213	43	86	129	171	214	257	52	103	155	207	258	310
3	30	60	91	121	151	181	36	72	109	145	181	217	44	87	131	174	218	261	53	105	158	211	263	316

CHLORINE CONCENTRATION	pH=8.0 Log Inactivation						pH=8.5 Log Inactivation						pH=9.0 Log Inactivation					
(mg/L)	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
<=0.4	46	92	139	185	231	277	55	110	165	219	274	329	65	130	195	260	325	390
0.6	48	95	143	191	238	286	57	114	171	228	285	342	68	136	204	271	339	407
0.8	49	98	148	197	246	295	59	113	177	236	295	354	70	141	211	281	352	422
1	51	101	152	203	253	304	61	122	183	243	304	365	73	146	219	291	364	437
1.2	52	104	157	209	261	313	63	125	188	251	313	376	75	150	226	301	376	451
1.4	54	107	161	214	268	321	65	129	194	258	323	387	77	155	232	309	387	464
1.6	55	110	165	219	274	329	66	132	199	265	331	397	80	159	239	318	398	477
1.8	56	113	169	225	282	338	68	136	204	271	339	407	82	163	245	326	408	489
2	55	115	173	231	288	346	70	139	209	278	348	417	83	167	250	333	417	500
2.2	59	118	177	235	294	353	71	142	213	284	355	426	85	170	256	341	426	511
2.4	60	120	181	241	301	361	73	145	218	290	363	435	87	174	261	348	435	522
2.6	61	123	184	245	307	368	74	148	222	296	370	444	89	178	267	355	444	533
2.8	63	125	188	250	313	375	75	151	226	301	377	452	91	181	272	362	453	543
3	64	127	191	255	318	382	77	153	230	307	383	460	92	184	276	369	460	552

Source: AWWA, 1991.

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

DESIGN NOTES AND COMPUTATIONS

SUBJECT: FLINT WTP - GAC SHEET NO. OF

HEAD LOSS THROUGH MEDIA

$$h_L = \frac{1.067\, V^2 D}{\phi\, g\, \epsilon^4} \left(\frac{C_D f}{d} \right)$$ ROSE EQUATION

V = flow velocity (fps)
D = media depth (ft)
d = particle dia. (ft)
C_D = drag coefficient
$= \frac{24}{R} + \frac{3}{\sqrt{R}} + 0.34$

$R = \frac{\phi d V}{\mu \text{ (kinematic)}}$

ϕ = shape factor
(0.82 - sand)
(0.80 - GAC)
(0.73 - crushed, angular sand)

ϵ = porosity

f = mass fraction of sand particles @ dia. (d)

V_{max} @ 3 gpm/sft

$$\frac{3 \text{ gal}}{\text{min} \cdot \text{sft}} \left| \frac{\text{cft}}{7.48052 \text{ gal}} \right| \frac{1 \text{ min}}{60 \text{ sec}} = 0.006684 \text{ fps}$$

SEE SPREADSHEET CALCS FOR EACH MEDIA

PREPARED BY JRH DATE 5/29/15 CHECKED BY DATE PROJECT NUMBER

D-005

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES
GAC Filter Evaluation
Filter Media Analysis 2015 1st Stage

WATER INPUT DATA	
Flow Rate (gpm/sf)	3.00
Velocity (fps)	0.005984
Water Temperature (F°)	32
Kinematic Viscosity (ft²/s)	1.931E-05
Dynamic Viscosity (# -sec/sf)	3.746E-05
Water Density (#/sf)	62.42
Mass Density (# -sec²/ft⁴)	1.940
g (ft/sec²) =	32.2

32
40
50
60
70
80
90

5/27/2015 field measurements
time: 2:30
Filter #7
water depth in service 98 inches = 8.17 ft
Flow as per panel 1160 gpm
8 filters in service
MOR plant flow

Existing Sand
Shape factor 0.82
Porosity = 0.4
Depth = 12 in = 1.0 ft

Mesh #	d mm	d in	d ft	f % passing	f % retained	f Cumulative	R	Cd	(Cd)(f)/d	
8	2	0.07874	0.00656	1	0	0	1.862	15.4	0.0	
16	1.18	0.04645	0.00387	0.9925	0.0075	0.0075	1.099	25.0	48.5	
30	0.6	0.02362	0.00197	0.3076	0.6849	0.6924	0.559	47.3	16,460	
50	0.3	0.01181	0.00098	0.0256	0.282	0.9744	0.279	91.9	26,337	
100	0.15	0.00591	0.00049	0.0087	0.0169	0.9913	0.140	180.2	5,186	
200	0.075	0.00295	0.00025	0.005	0.0037	0.995	0.070	355.3	5,343	
	0.0312	0.00123	0.00010	0	0.005	1	0.029	844.0		lost by wash
									54,376	

Head loss = 3.02 ft

Anthracite
Shape factor 0.7
Porosity = 0.45
Depth = 18 in = 1.5 ft

Mesh #	d mm	d in	d ft	f % passing	f % retained	f Cumulative	R	Cd	(Cd)(f)/d
8	2.38	0.09370	0.00781	0.95	0.05	0.05	2.162	13.5	85.3
12	1	0.03937	0.00328	0.1	0.9	0.950	0.909	29.9	5,203
30	0.6	0.02362	0.00197	0.04	0.01	0.960	0.545	48.4	246
40	0.4	0.01575	0.00131	0.01	0.03	0.990	0.363	71.4	1,631
100	0.15	0.00591	0.00049	0.0075	0.0025	0.993	0.135	184.6	938
200	0.075	0.00295	0.00025	0.005	0.0025	0.995	0.068	364.1	3,699
	0.0312	0.00123	0.00010	0	0.005	1	0.028	864.9	
									14,803

Head loss = 1.15 ft = 13.7 in

Ex. mixed media HL = 4.98 ft

Proposed Sand w/ 400
Shape factor 0.82
Porosity = 0.4
Depth = 12 in = 1.0 ft

Mesh #	d mm	d in	d ft	f % passing	f % retained	f Cumulative	R	Cd	(Cd)(f)/d	
-16	1.154	0.0454	0.00379	0.9	0.1	0.1	1.075	25.6	675	
-20	0.825	0.0325	0.00271	0.6	0.4	0.5	0.768	35.0	5,173	
35	0.5	0.0197	0.00164	0.1	0.4	0.9	0.466	58.3	13,724	
50	0.3	0.0118	0.00098	0.05	0.05	0.95	0.279	91.9	4,670	
100	0.15	0.0059	0.00049	0.005	0.045	0.995	0.140	180.2	16,476	
200	0.075	0.0030	0.00025	0.005	0	0.995	0.070	355.3	0	
	0.0312	0.0012	0.00010	0	0.005	1	0.029	844.0		lost by wash
									40,718	

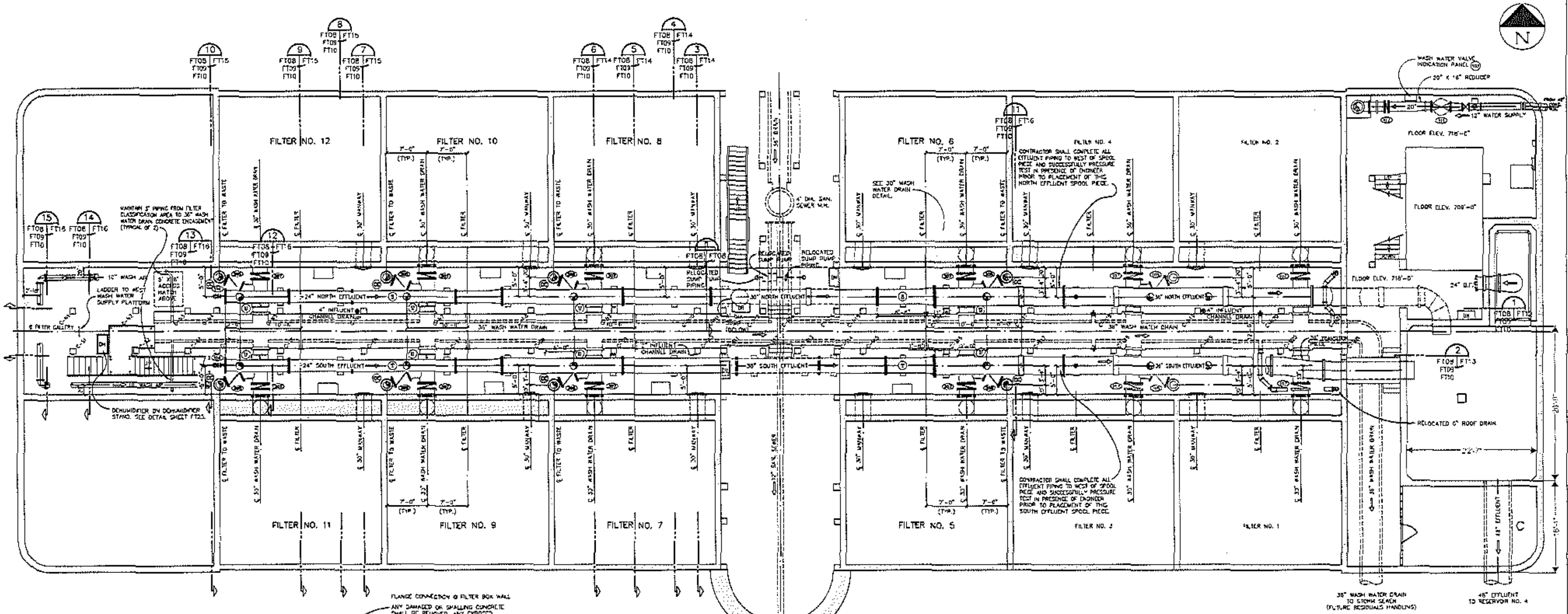
Head loss = 2.87 ft

GAC - Filtrsorb 400
Shape factor 0.9
Porosity = 0.614
Depth = 18 in = 1.5 ft

Mesh #	d mm	d in	d ft	f % passing	f % retained	f Cumulative	R	Cd	(Cd)(f)/d
8	2.38	0.0937	0.00781	0.99	0.01	0.01	2.162	13.5	17.3
12	1.68	0.0661	0.00551	0.95	0.04	0.05	1.526	18.5	134.2
30	0.6	0.0236	0.00197	0.1	0.85	0.9	0.545	48.4	20,913
40	0.4	0.0157	0.00131	0.04	0.06	0.96	0.363	71.4	3,263
100	0.15	0.0059	0.00049	0.01	0.03	0.99	0.135	184.6	11,252
200	0.075	0.0030	0.00025	0.005	0.005	0.995	0.068	364.1	7,398
	0.0312	0.0012	0.00010	0	0.005	1	0.028	864.9	
									42,976

Head loss = 0.84 ft = 10.1 in

Pr. mixed media HL = 3.71 ft

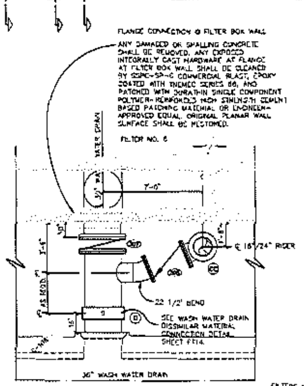


FILTER PLAN – EL. 720'-0"

SCALE : 1/8" = 1'-0"

FILTER GALLERY PIPING LEGEND

ID	DESCRIPTION	EXISTING	NEW
P	WASH WATER SUPPLY – GALLERY SERVING FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
Q	BACKWASH FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	NO
R	EFFLUENT FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
S	NORTH EFFLUENT	YES	YES
T	SOUTH EFFLUENT	YES	YES
U	WASH WATER DRAIN FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
V	INFLUENT FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
W	SURFACE WASH FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	NO
X	PLANT WATER AND SURFACE WASH	YES	NO
AA	WASH AIR SUPPLY – GALLERY	YES	NO
BB	WASH AIR SUPPLY FILTERS NO. 5 – NO. 12, INCLUSIVE	NO	YES
CC	FILTER TO WASTE SERVING FILTERS NO. 5 – NO. 12, INCLUSIVE	NO	YES
DD	PROCESS WATER	NO	YES
EE	WASH WATER SUPPLY – WEST	NO	YES



FILTERS NO. 7, 9, & 11 SIMILAR.
FILTERS NO. 5, 6, 10, & 12 OPPOSITE HAND.

30" WASH WATER DRAIN DETAIL

SCALE : 1/4" = 1'-0"

EXISTING CAST IRON WASH WATER DRAIN DISTANCE FROM FILTER BOX WALL TO FLANGE/FLANGE FACE	
FILTER NO.	DISTANCE "D"
5	8.5"±
6	10"±
7	8.5"±
8	8.5"±
9	9.5"±
10	8"±
11	9.75"±
12	8.5"±

GENERAL NOTE

ALL DRAWINGS ARE A REPRESENTATION OF ACTUAL CONDITIONS BASED ON 1952 CONSTRUCTION PLAN DRAWINGS. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, SIZES, AND LOCATIONS OF ALL RELEVANT ITEMS.

GENERAL NOTE NO. 1 ⚠

THIS NOTE APPLIES TO DRAWINGS FT01 THROUGH FT28

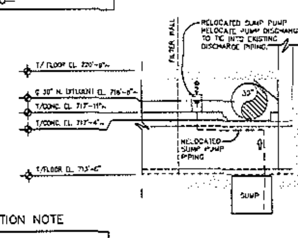
THE WORK ARE FOR ALL CONCRETE SURFACES THAT ARE REPAIRED, INFILLED OR PATCHED SHALL BE SMOOTH AND FLUSH WITH SURROUNDING CONCRETE SURFACES. IF NECESSARY THE CONTRACTOR SHALL GRIND THE NEW SURFACES TO BE FLUSH WITH THE ADJOINING SURFACES.

GENERAL CONSTRUCTION NOTE

NO MOUNTING OR FASTENING OF ANY TEMPORARY OR PERMANENT EQUIPMENT, SUPPORTS, OR DEVICES TO THE CONCRETE OF THE FILTER BOXES OR INFLUENT CHANNEL IS PERMITTED.

PIPE END CONFIGURATION LEGEND

- FLANGE
- GROOVE END COUPLING
- SLEEVE TYPE COUPLING

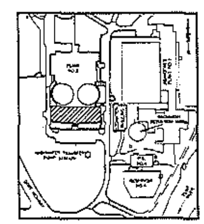


SECTION 1

SCALE : 1/4" = 1'-0" FT08 | FT08

NOTES :

1. FILTER INTERNALS NOT SHOWN FOR CLARITY.
2. SUPPORT MECHANISMS FOR VALVES, ACTUATORS, & PIPING NOT SHOWN FOR CLARITY. REFER TO 1/4 SCALE SECTIONS FOR SUPPORT LOCATIONS.
3. HANDRAIL NOT SHOWN FOR CLARITY. SEE NEW FILTER GALLERY SECTION FOR NEW HANDRAIL AT FLOOR ELEV. 718'± AT TOP OF 30" WASH WATER DRAIN CONCRETE ENCASEMENT.



KEY PLAN

THE DLZ TEAM

FLINT MICHIGAN

CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS & UTILITIES

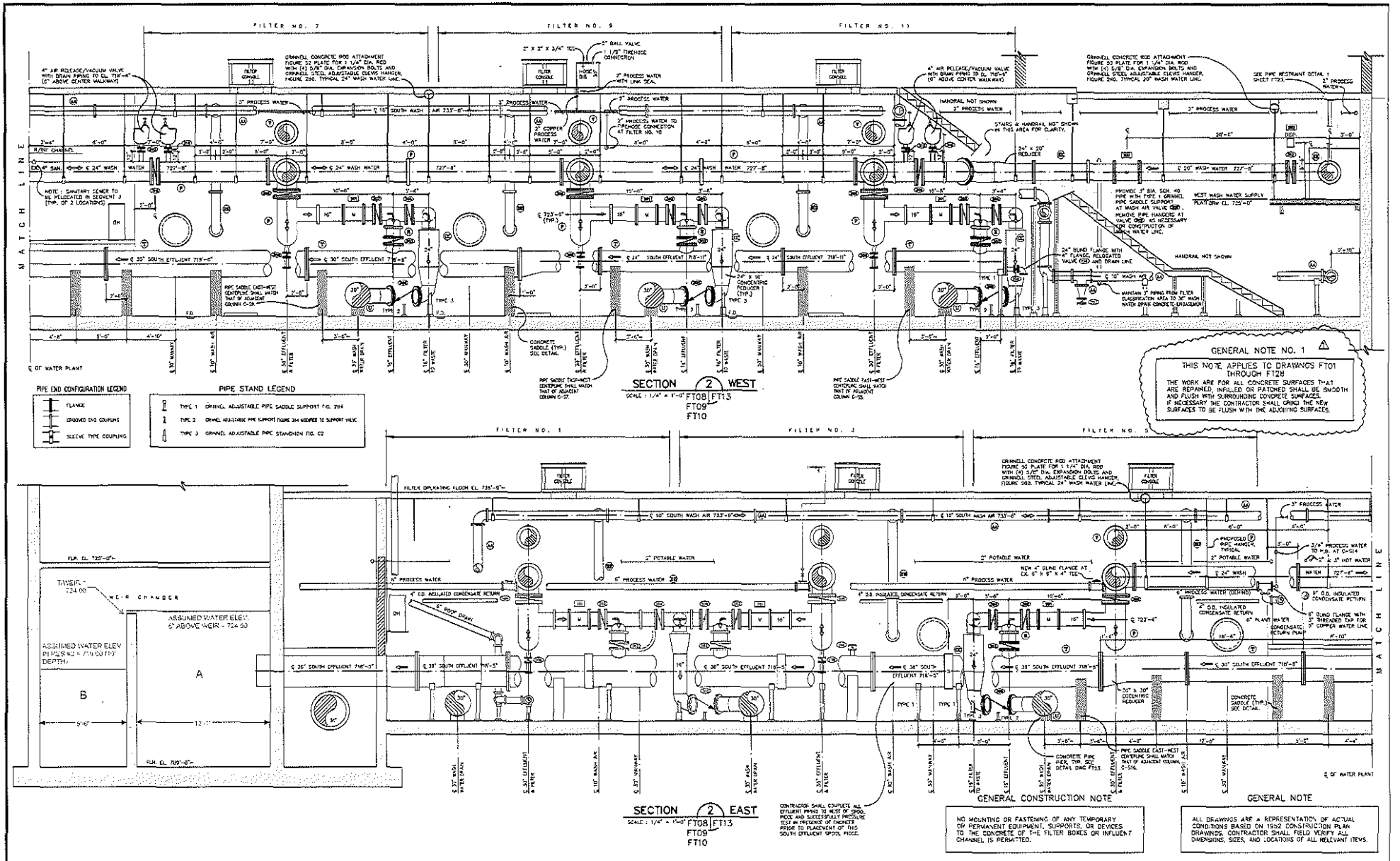
WATER TREATMENT PLANT REHABILITATION
PHASE I, SEGMENT 4

FILTER REHABILITATION
NEW FILTER PLAN – EL. 720'-0"

DRAWN	J.B.P.
CHK'D.	C.A.F.
APPR'D	C.A.F.
DATE	JUNE 2002
PROJECT NUMBER	7019-04

NO.	REVISION	BY	DATE
1	ADDENDUM NO. 1 REVISION	JO	10/03
	AS-BUILT	DJV	8/05

SHEET
OF
DRAWING NUMBER
FT08



THE DLZ TEAM

FLINT MICHIGAN

CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS & UTILITIES

WATER TREATMENT PLANT REHABILITATION
PHASE I, SEGMENT 4

FILTER REHABILITATION
NEW FILTER GALLERY SECTIONS

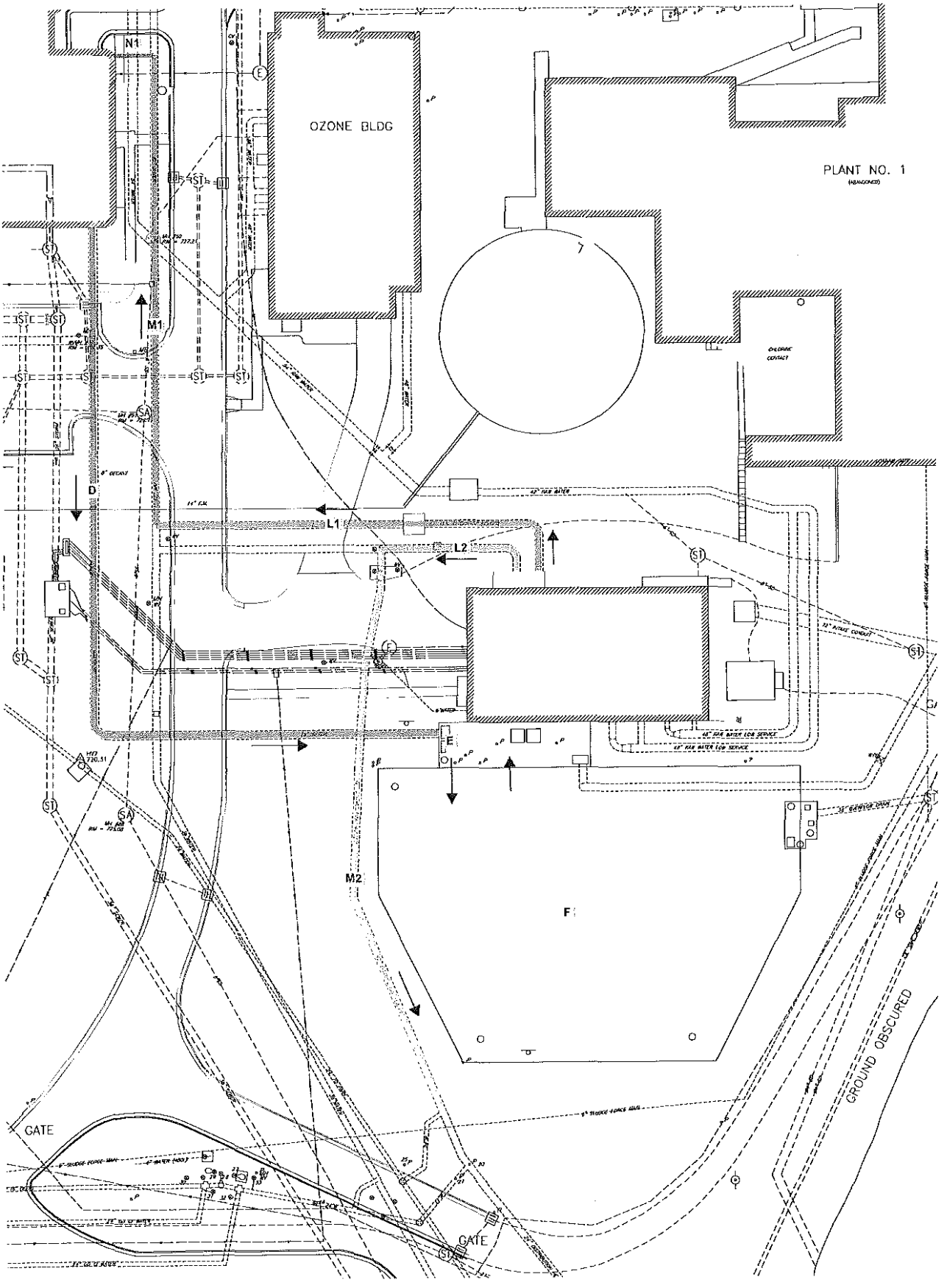
DRAWN	J.B.P.
CHK'D.	C.A.P.
APPR'D	C.A.P.
DATE	JUNE 2002
PROJECT NUMBER	7019-04

NO.	REVISION	BY	DATE
1	ADDENDUM NO. 1 REVISION	JO	10/03
2	AS-BUILT	DJV	8/05

SHEET
OF
DRAWING NUMBER
FT13

005734

005735


N1
OZONE BLDG
PLANT NO. 1
(ABANDONED)
M1
D
L1
L2
FE
M2
F
GATE
GATE
GROUND OBSCURED

005736



CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

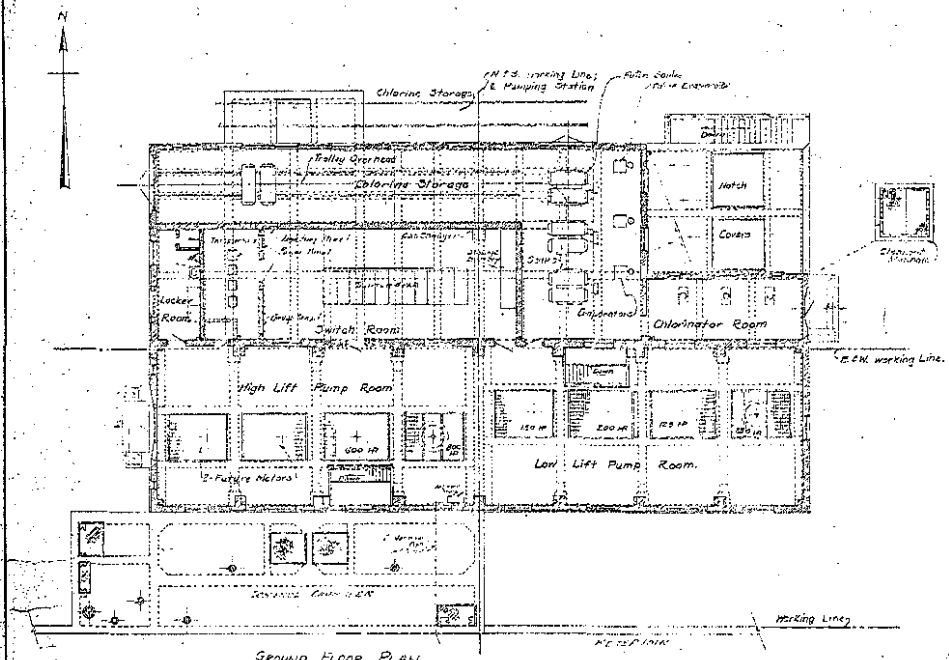
GENERAL PLAN

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

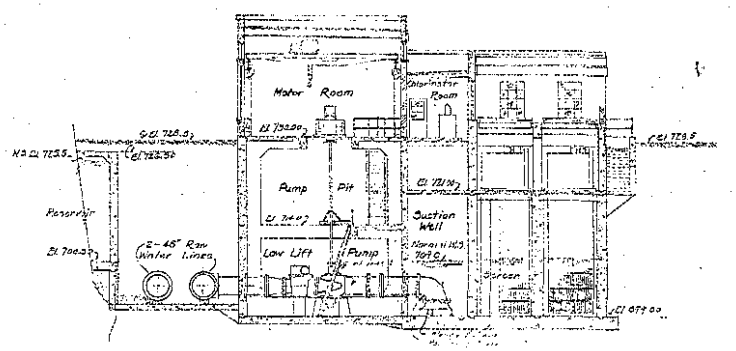
SCALE: 1"=20'-0" JUNE 1948

22101-2

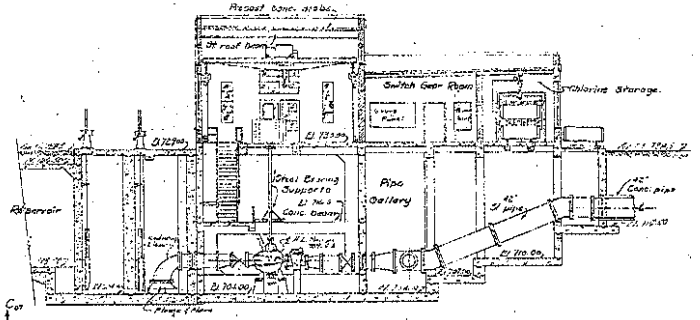
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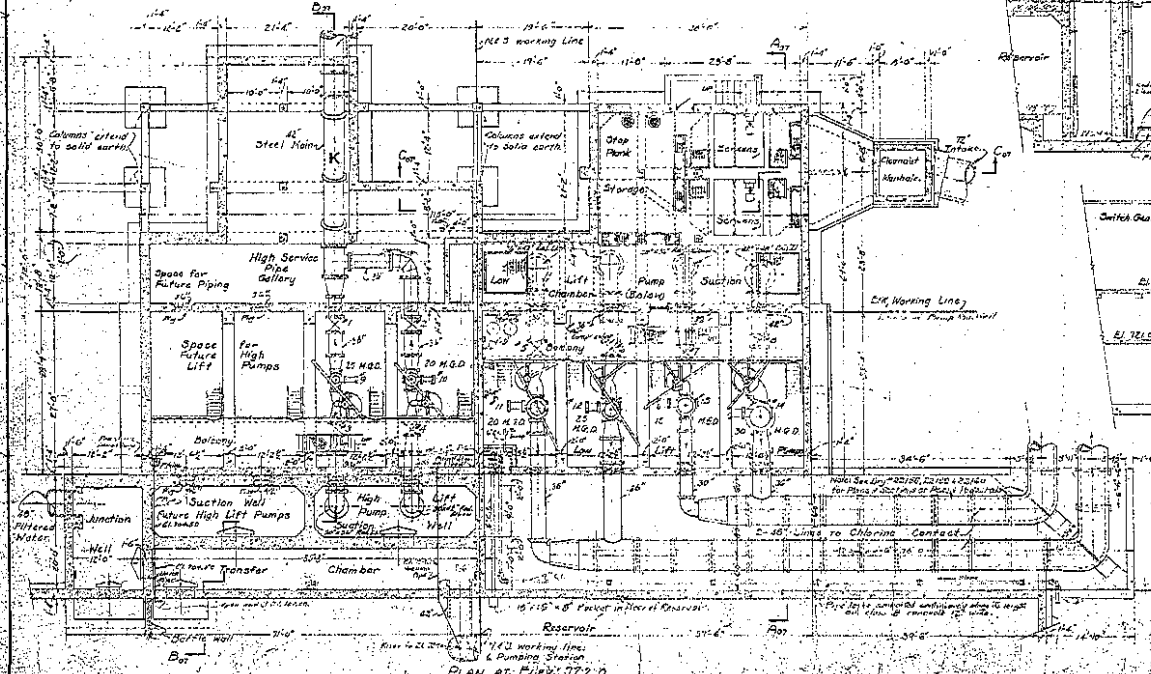


GROUND FLOOR PLAN

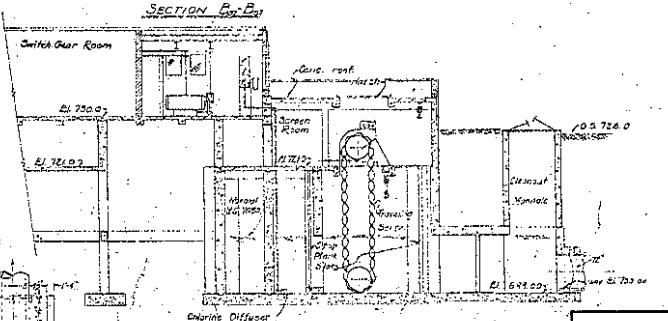


SECTION A-A





PLAN AT ELEV. 722.0



SECTION C-C

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

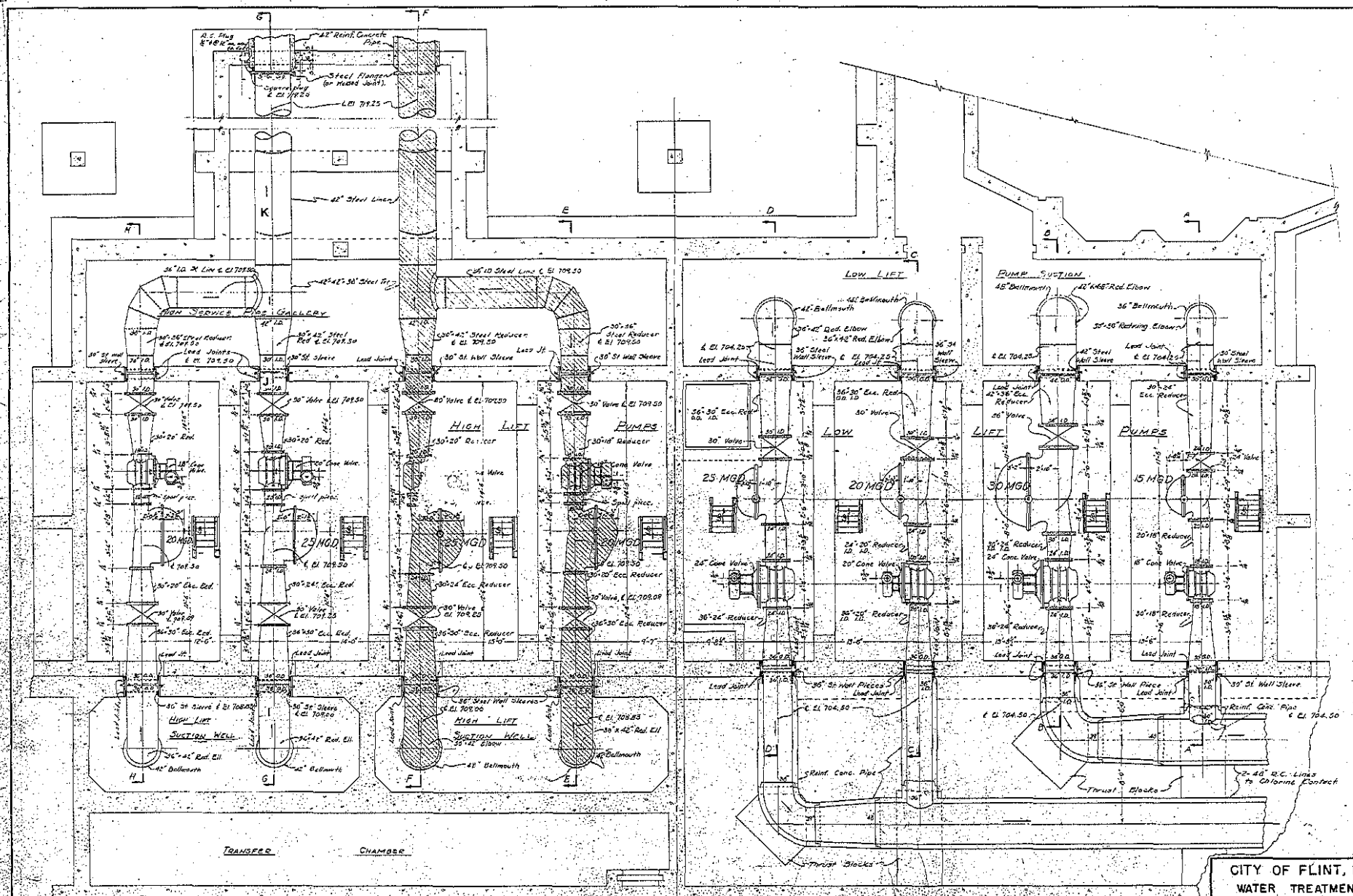
PUMPING STATION NO. 3
GENERAL PLAN

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: 1" = 10'-0" JUNE 1948

22107-2

005738



Pumping Station
(North-South working line)

PARTIAL SECTIONAL PLAN @ El. 711'±
(Showing High & Low Lift Piping)
Scale: ¼"=1'-0"

Note:
Layout of pipe in Pump Station is for Steel pipe.
Denotes Future High Lift Pumps & Pipes

REV. 5	MAR'48	Dimension Changes	J.C.H.
REV. 4	FEB'48	Relocate High Lift Pump	T.G.D.
REV. 3	JAN'48	Relocate Low Lift Valves	T.G.D.
REV. 2	DEC'47	Complete Details	T.G.D.
REV. 1	OCT'47	General Issue	
DRAWN BY		CHECKED BY	

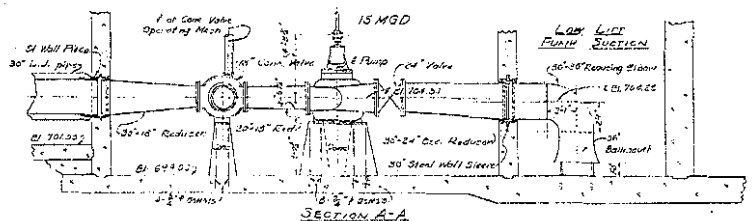
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
PUMPING STATION NO. 3
PLAN OF PUMP PIPING

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

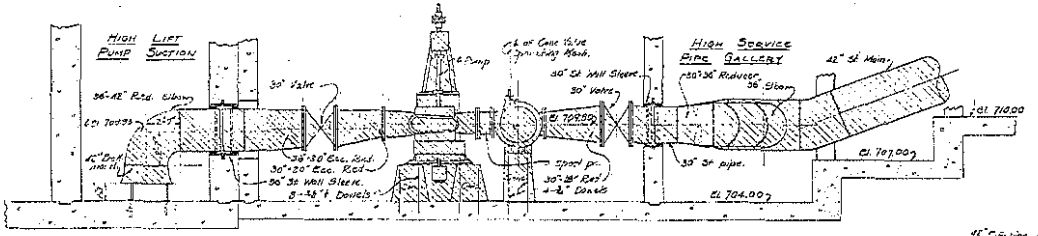
SCALE AS SHOWN NOV. 1946

S 22107-A4

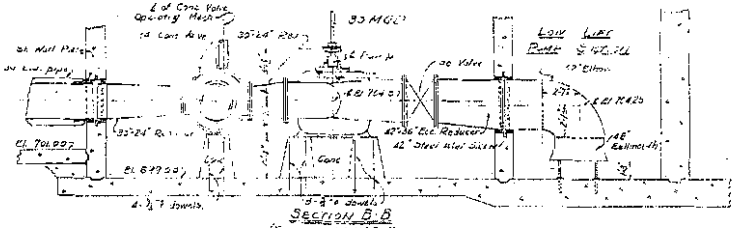
005739



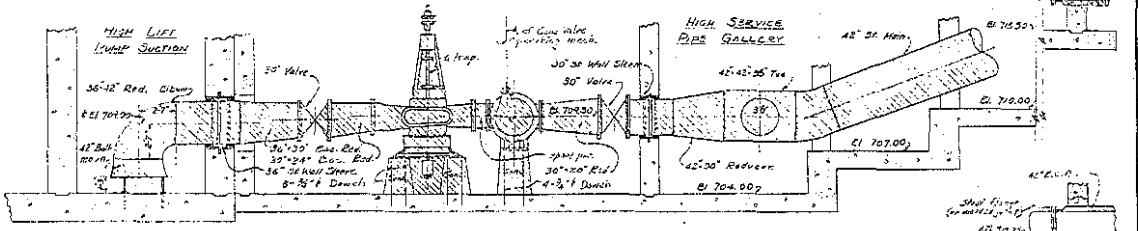
SECTION A-A
(Showing 15 MGD Pump)
Scale ¼"=1'-0"



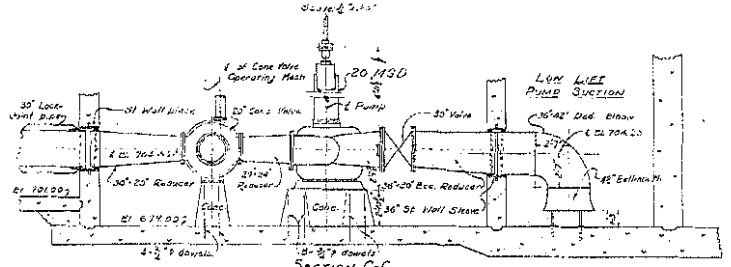
SECTION E-E
(Showing 20 MGD Pump)
Scale: ¼"=1'-0"



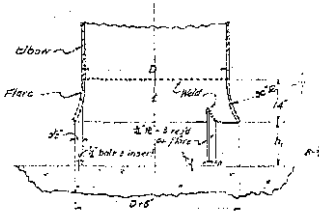
SECTION B-B
(Showing 33 MGD Pump)
Scale ¼"=1'-0"



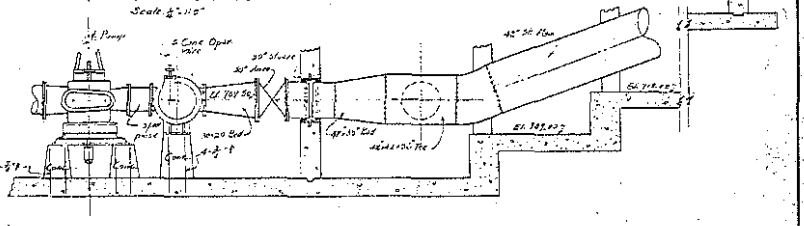
SECTION F-F
(Showing 25 MGD Pump)
Scale ¼"=1'-0"



SECTION C-C
(Showing 20 MGD Pump)
Scale: ¼"=1'-0"

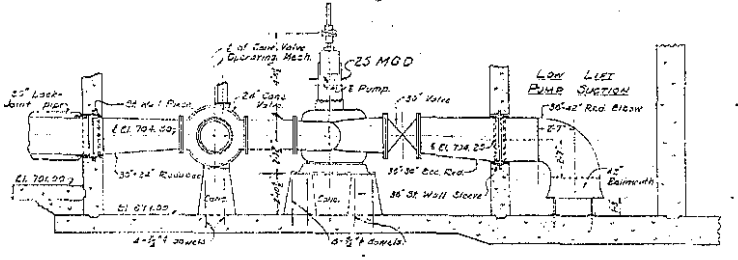


BELLMOUTH & SUPPORT DETAILS
No Scale

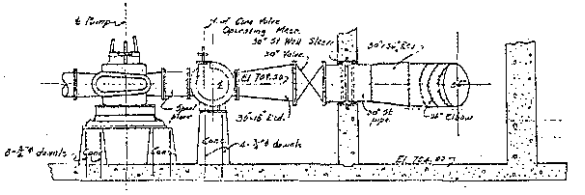


SECTION G-G
(Showing 25 MGD Pump Discharge)
Scale ¼"=1'-0"

High Service	D	D+8"	h
25 MGD Pump	42"	50"	12"
20 MGD Pump	42"	50"	12"
Low Service	D	D+8	h
15 MGD Pump	36"	44"	10"
20 MGD Pump	42"	50"	12"
25 MGD Pump	48"	56"	12"
33 MGD Pump	48"	56"	12"



SECTION D-D
(Showing 25 MGD Pump)
Scale: ¼"=1'-0"



SECTION H-H
(Showing 20 MGD Pump Discharge)
Scale: ¼"=1'-0"

NOTE:
1. ////// Denotes Future High Lift Pumps & Pipes.
2. Suction piping for High Lift Pump is as shown in Sects E-E & F-F.

REV	BY	MARK OF STEEL PIECE NOTATIONS & SEAL
REV	4	Feb 48 Relocate H.L.P. Pumps 7&8
REV	3	Mar 47 Relocate L.L.P. Bellmouths
REV	2	DEC 45 Complete Details Plant
REV	1	DEC 45 Original Issue

DRAWN BY [illegible] CHECKED BY

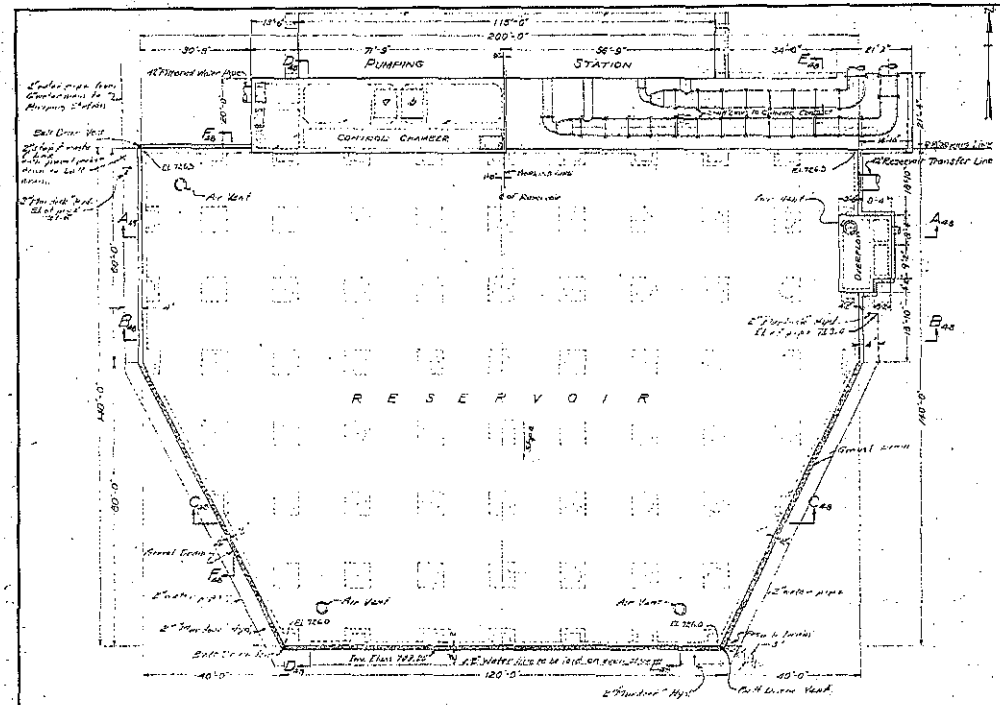
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
PUMPING STATION NO.3
SECTIONS OF PUMP PIPING

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: AS SHOWN NOV. 1948

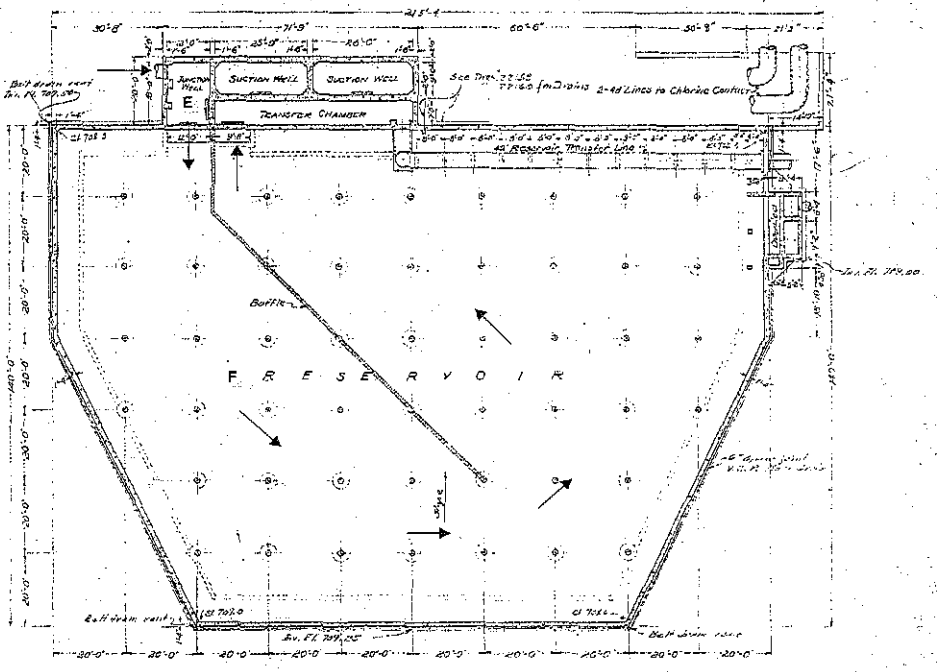
S 22107-84

005740

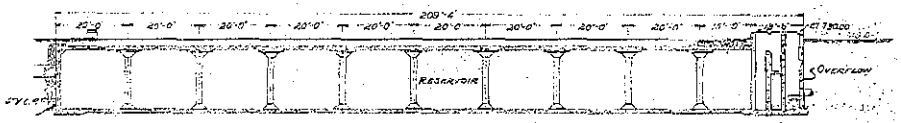


PLAN VIEW OF RESERVOIR

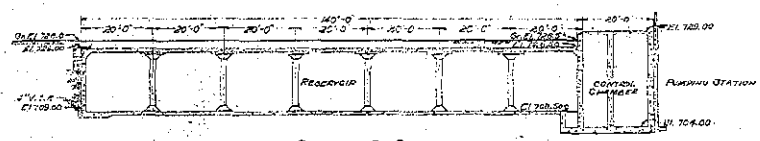
AVG W = $\frac{(200' \times 60') + [(200' + 120')/2 \times (80')]}{140'} = 177'$



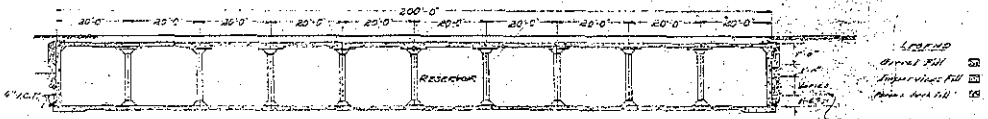
PLAN OF FLOOR SLAB



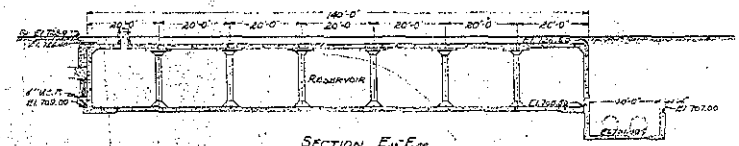
SECTION A_{48}-A_{48}



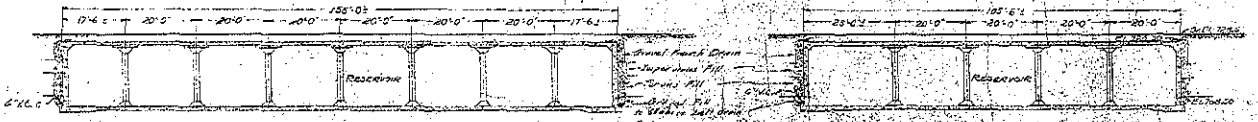
SECTION D_{48}-D_{48}



SECTION B_{48}-B_{48}



SECTION E_{48}-E_{48}



SECTION C_{48}-C_{48} TYPICAL BACKFILL REQUIREMENT SECTION F_{48}-F_{48}

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

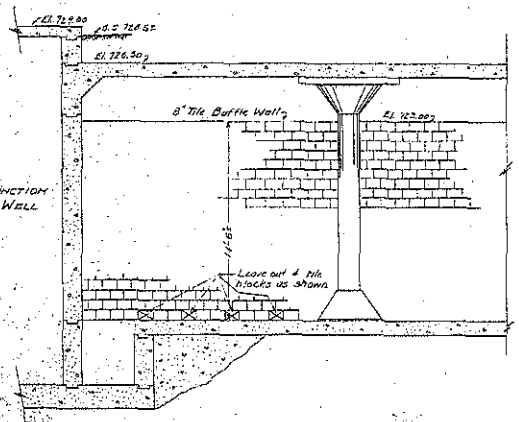
RESERVOIR NO. 3
GENERAL PLANS & SECTIONS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

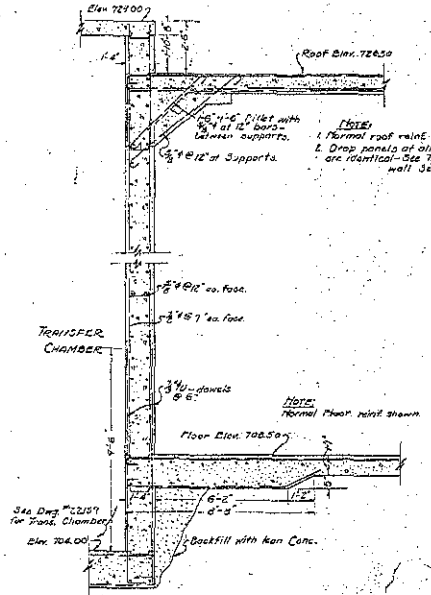
SCALE: 1" = 0" JUNE 1948

22148-2

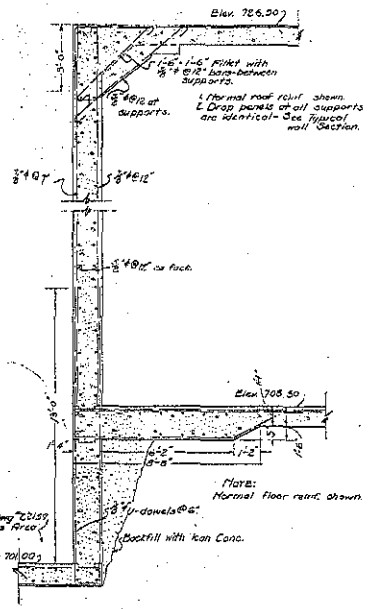
005741



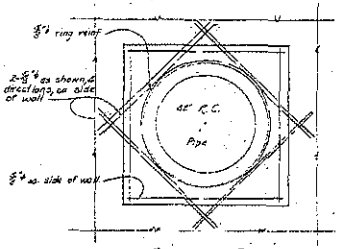
TYPICAL DETAIL OF TILE BAFFLE WALL
Scale: ½"=1'-0"



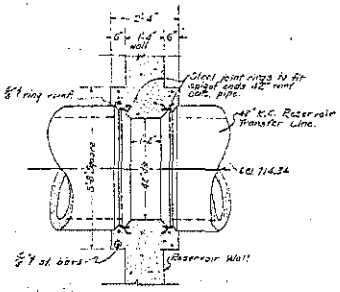
WALL SECTION AT TRANSFER CHAMBER
Scale: ⅜"=1'-0"



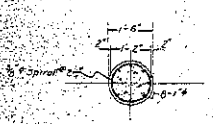
WALL SECTION EAST OF TRANSFER CHAMBER
Scale: ⅜"=1'-0"

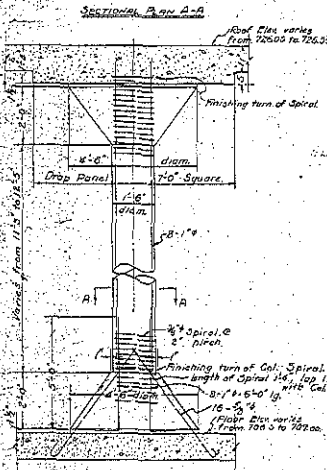


SECTIONAL PLAN
42" TRANSFER LINE AT RESERVOIR WALL
Scale: ½"=1'-0"



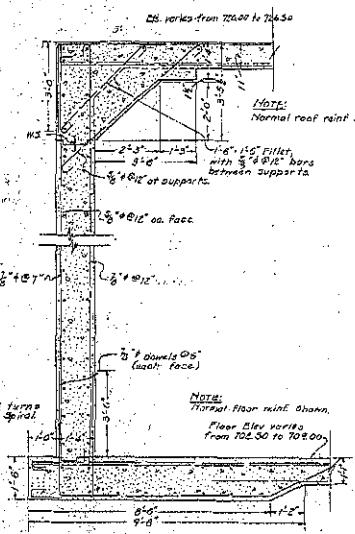
SECTIONAL ELEVATION
DETAIL 42" R.C. TRANSFER LINE AT RESERVOIR WALL
Scale: ½"=1'-0"



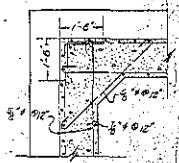


SECTIONAL PLAN A-A

ELEVATION OF TYPICAL COLUMN
Scale: ½"=1'-0"



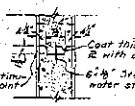
TYPICAL WALL SECTION
(Where wall varies, See other Sections)
Scale: ½"=1'-0"



TYPICAL NORTH CORNER DETAILS
Scale: ½"=1'-0"

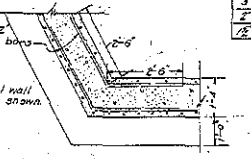


HORIZONTAL WATER STOP
Scale: 1"=1'-0"

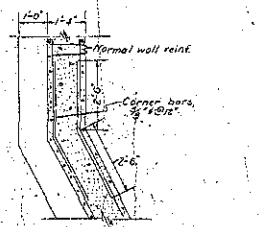


TYPICAL VERTICAL JOINT
Scale: ½"=1'-0"

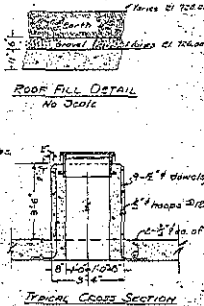
CONCRETE COVER FOR REINFORCING STEEL.	
3"	For bottom face of all footings & pipe sleeves
2"	For all slabs and vertical walls.
1½"	For all faces of exposed dry slabs & beams



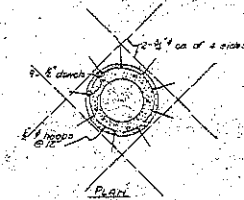
TYPICAL FOR CORNERS 1 & 6
Scale: ½"=1'-0"



TYPICAL FOR CORNERS 2 & 5
Scale: ½"=1'-0"



ROOF FILL DETAIL
No Scale



PLAN

TYPICAL CROSS SECTION

AIR VENT DETAIL
Scale: ¾"=1'-0"

Note: For location of Air Vents, see Dwg. #22148

Note: See concrete cover for reinforcing steel this sheet.

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
DETAILS

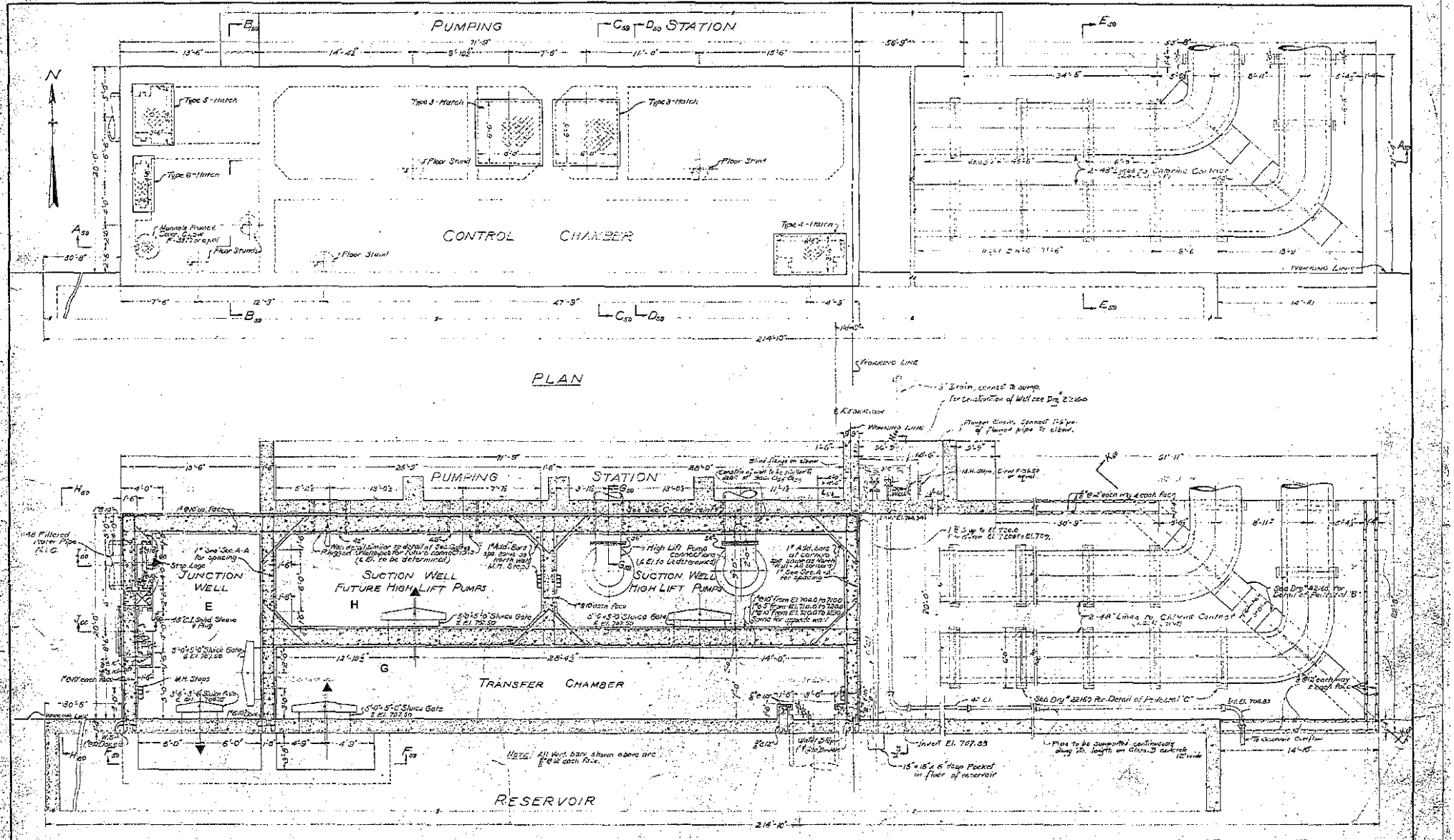
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

REV.	ORIGINAL ISSUE
DRAWN BY: M.A.P.	CHECKED BY:

SCALE AS NOTED JULY 1958

22157

005742



CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

RESERVOIR NO. 3
CONTROL CHAMBER PLANS

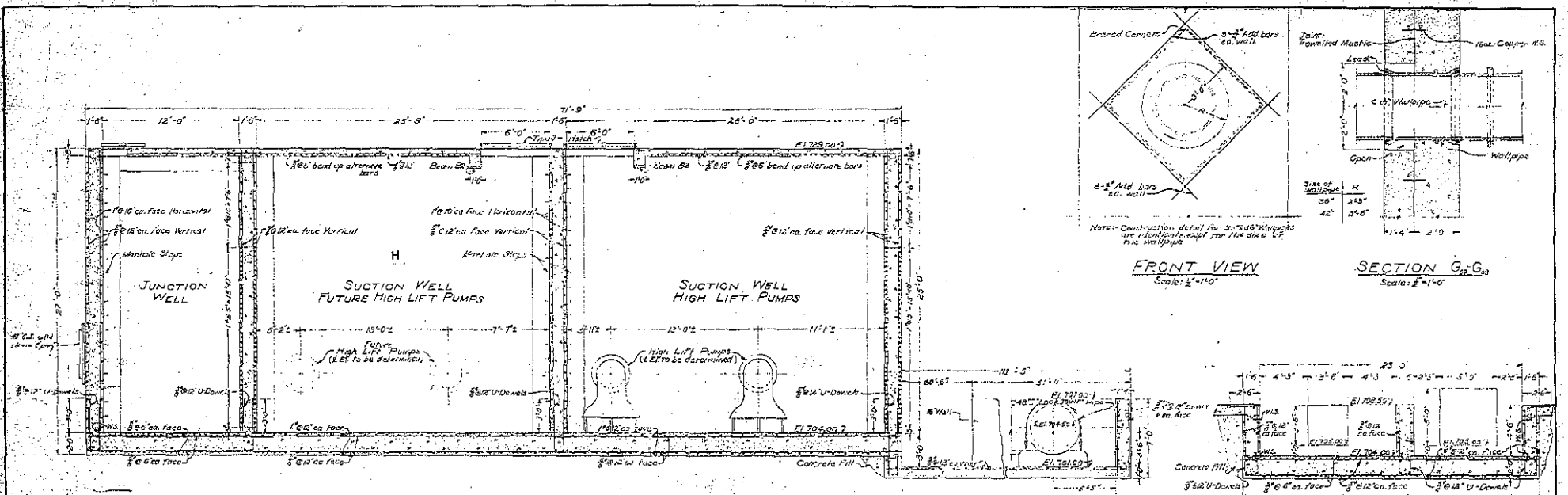
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE 1/8" = 1'-0" JULY, 1948

DRAWN BY: K.T. CHECKED BY:

221-8-2

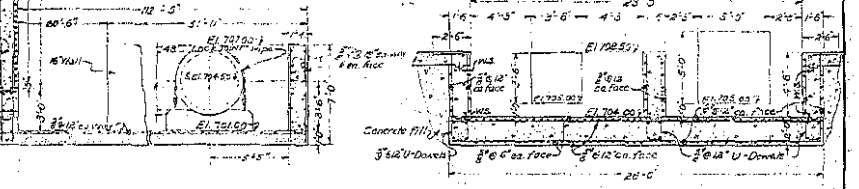
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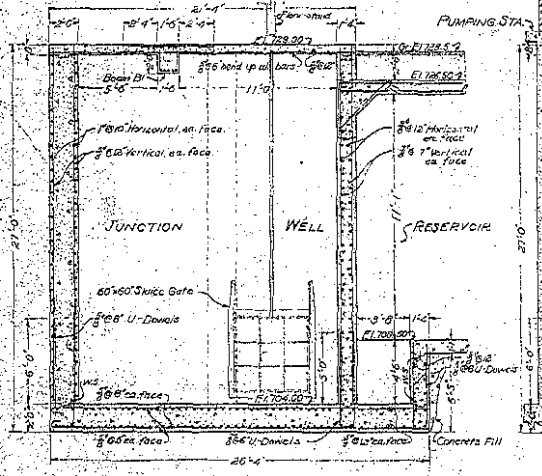
SECTION A_{39}-A_{39}

FRONT VIEW
Scale: 1/4"=1'-0"

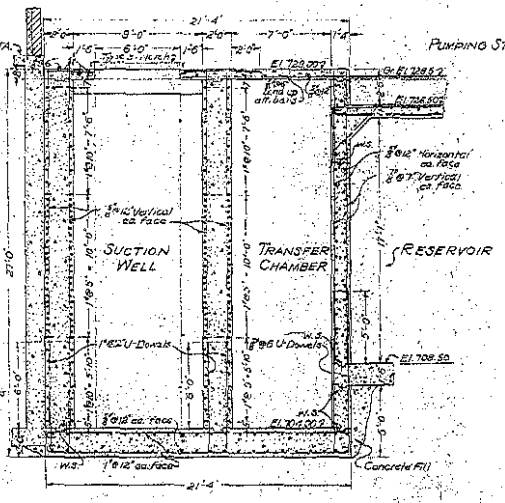
SECTION G_{39}-G_{39}
Scale: 1/4"=1'-0"



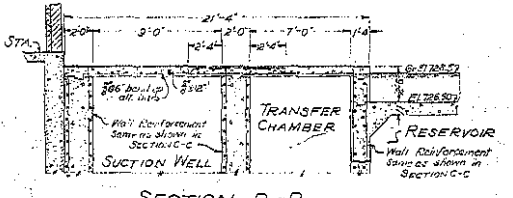
SECTION F_{39}-F_{39}



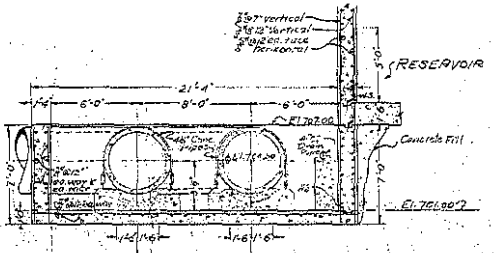
SECTION B_{39}-B_{39}



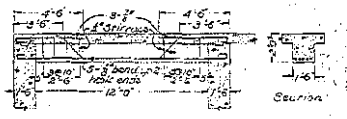
SECTION C_{39}-C_{39}



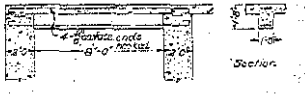
SECTION D_{39}-D_{39}



SECTION E_{39}-E_{39}



DETAIL OF BEAM B1



DETAIL OF BEAM B2

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
CONTROL CHAMBER SECTIONS

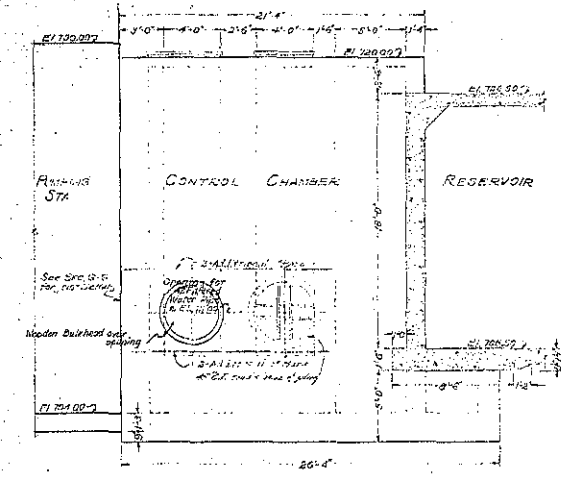
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE 1/4"=1'-0" UNLESS NOTED — JULY, 1948

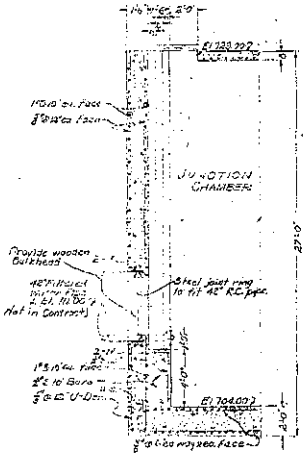
DRAWN BY — CHECKED BY — CHECKED BY

22159-2

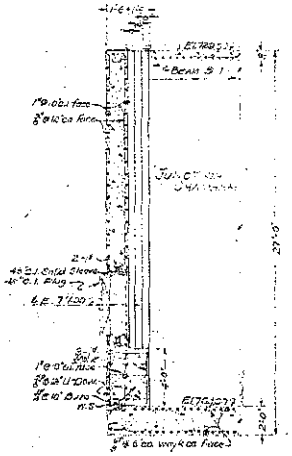
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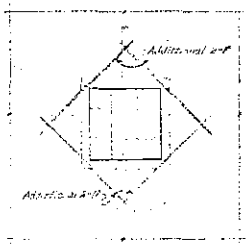
SECTION H_{60}-H_{60}
Scale: $\frac{1}{4}$"=1'-0"



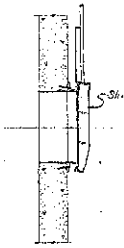
SECTION I_{60}-I_{60}
Scale: $\frac{1}{4}$"=1'-0"



SECTION J_{60}-J_{60}
Scale: $\frac{1}{4}$"=1'-0"

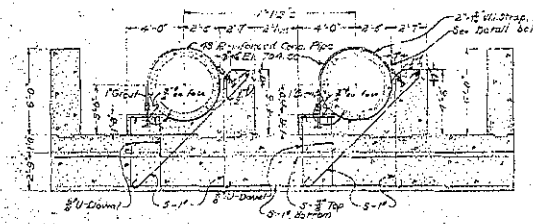


FRONT VIEW

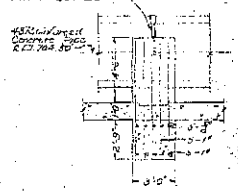


SECTION

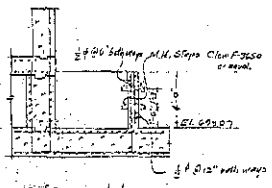
TYPICAL SLUICE GATE INSTALLATION



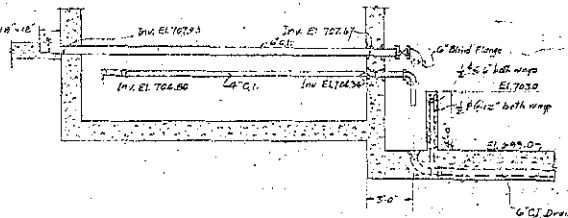
PEDESTAL 'B'
SECTION K_{60}-K_{60}
Scale: $\frac{1}{4}$"=1'-0"



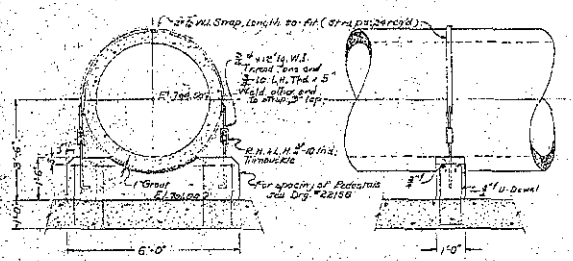
SECTIONAL VIEW
Scale: $\frac{1}{4}$"=1'-0"



SECTION L_{60}-L_{60}
Scale: $\frac{1}{4}$"=1'-0"



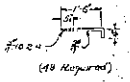
SECTION M_{60}-M_{60}
Scale: $\frac{1}{4}$"=1'-0"



FRONT VIEW

SIDE VIEW

(24 Required)
DETAIL OF PEDESTAL 'B'
Scale: $\frac{1}{4}$"=1'-0"



(48 Required)
ANCHOR BOLT DETAIL
Scale: 3"=1'-0"

Ck'd	5-16-45	Sect. for Stage Hydrants Added	
Rev'd		Original Issue	
Drawn By		Checked By	

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
CONTROL CHAMBER DETAILS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: 1"=1'-0" UNLESS NOTED JULY 1945

22160-2

Rennaker, Joanne (DEQ)

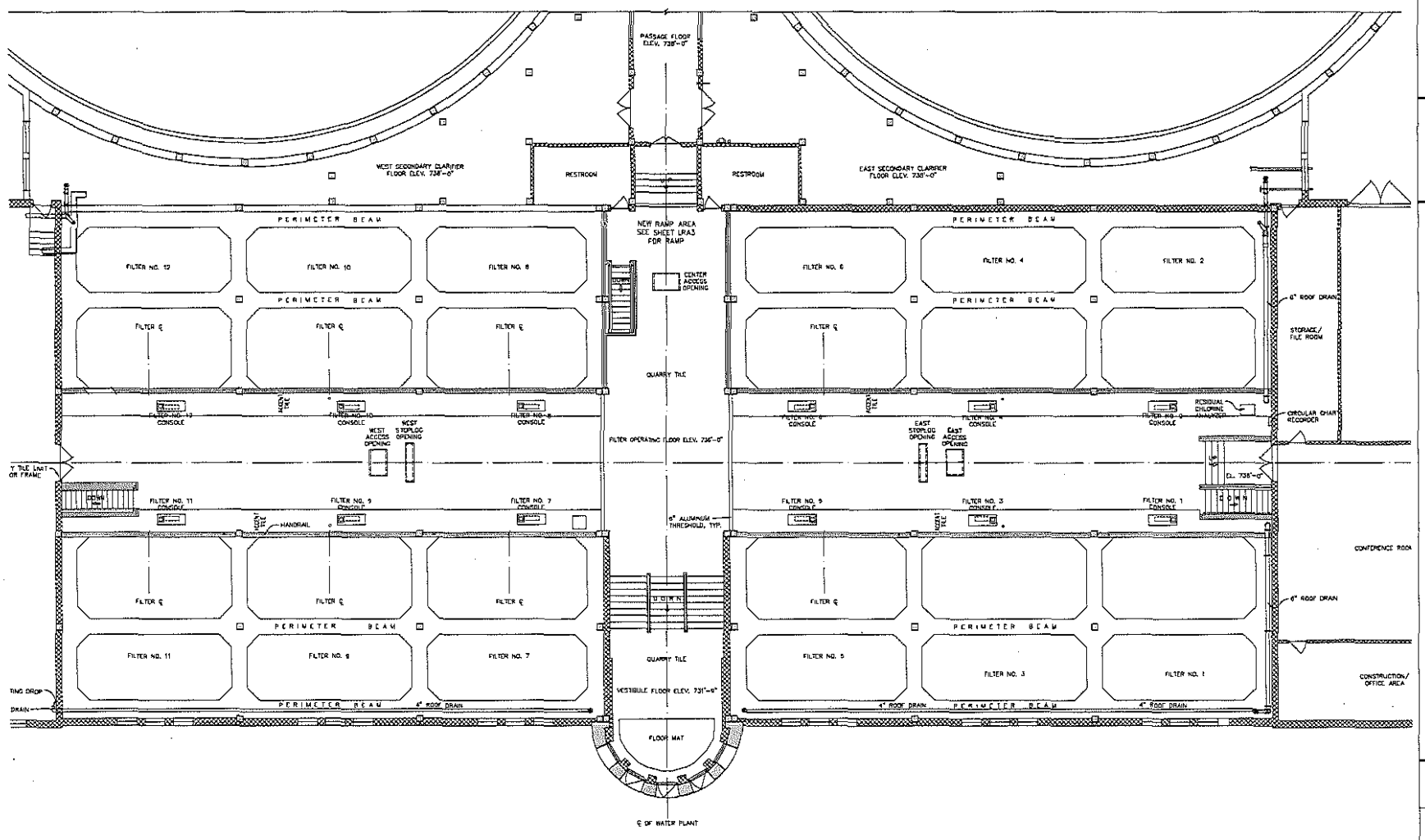
From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Saturday, June 13, 2015 12:52 PM
To: Prysby, Mike (DEQ)
Cc: Busch, Stephen (DEQ); Cook, Pat (DEQ); Matta, Samir; Green, Warren; Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com
Subject: Flint GAC 2 of 2
Attachments: Flint-PRELIM-Drawings.pdf

Preliminary plans.

Jeffrey R. Hansen
Senior Project Manager

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 **C** 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

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1 **FILTER GALLERY**
SCALE: 1/8" = 1'-0"

Flint WTP
Phase II, Segment III - Electrical Improvements
Flint MI, 48505

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B
Flint, MI 48532
Tel 810-820-2682 Fax 810-820-2781

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

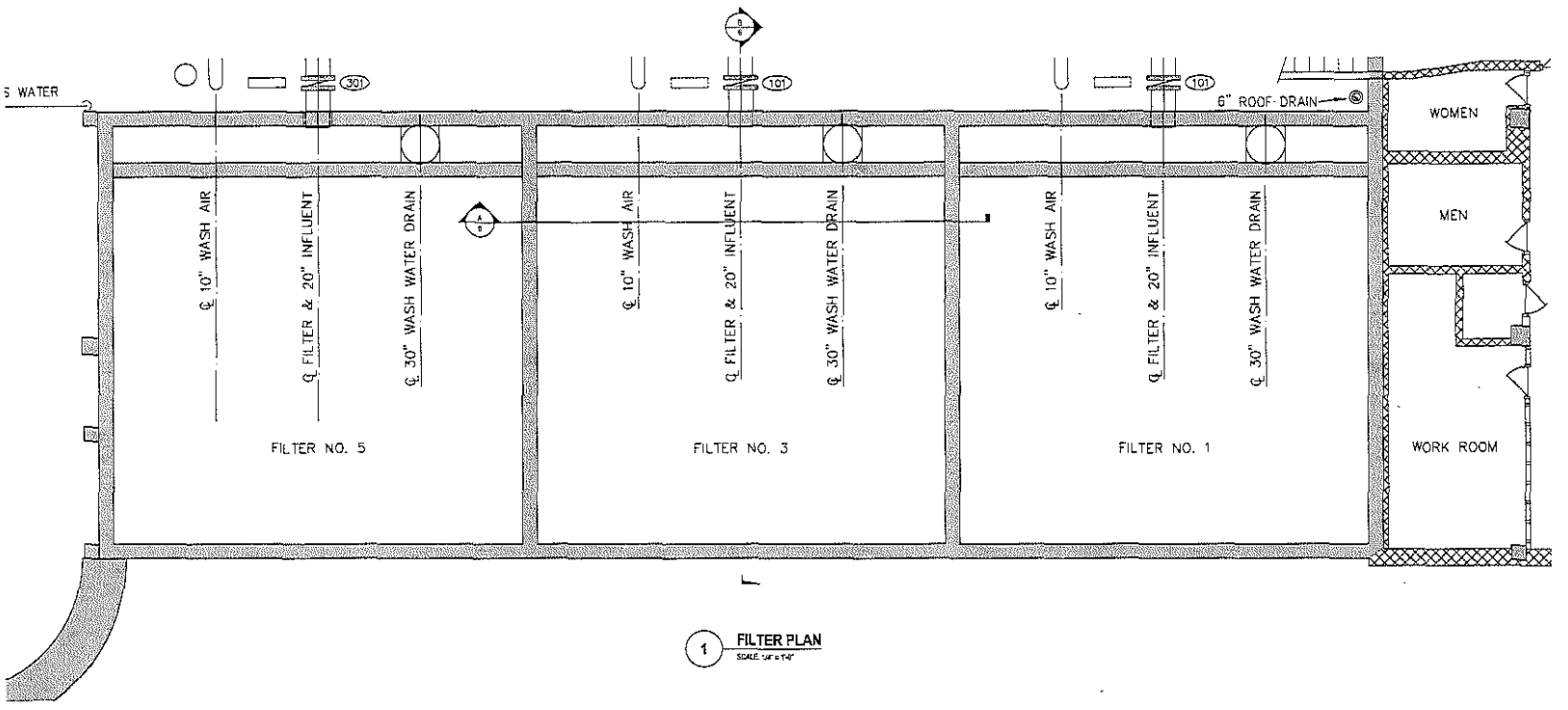
Manager	TM
Design	MH
Draw	GH
Check	
QA/QC	

Project No. 130-10701-001
Date: January 17, 2014

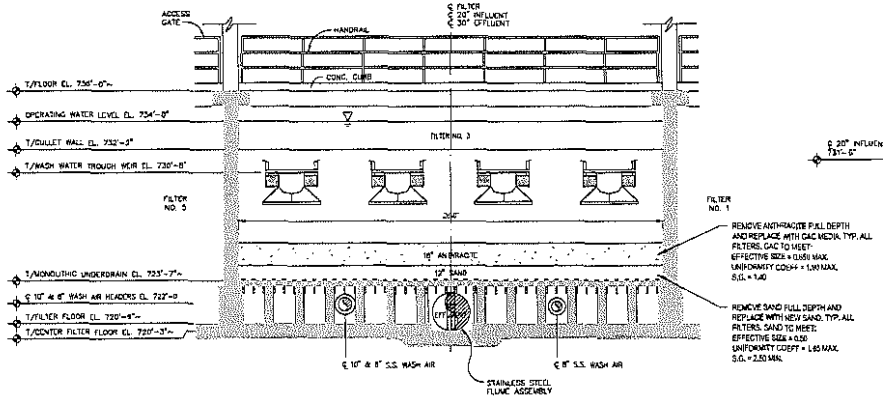
FILTER GALLERY PLAN

C4-101
5 OF XX

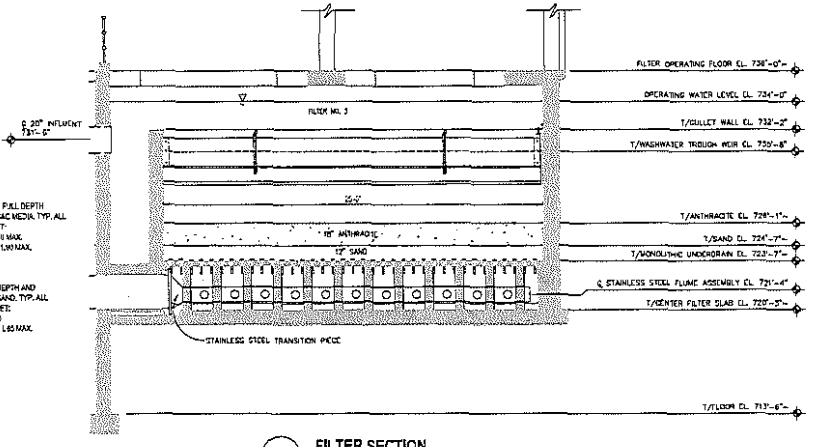
Plotted By: Hossain, Sabi
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1 **FILTER PLAN**
SCALE: 1/4" = 1'-0"



A **FILTER SECTION**
SCALE: 1/4" = 1'-0"



B **FILTER SECTION**
SCALE: 1/4" = 1'-0"

Flint WTP
Phase II, Segment III - Electrical Improvements
Flint MI, 48505

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B
Flint, MI 48532
Tel 810-820-2482 Fax 810-820-2703

KEY PLAN

REVISIONS

NO	DESCRIPTION	DATE

FILE LOG

Manager	
Design	
Drawn	
Check	

Project No. 130-10701-001
Date: January 17, 2014

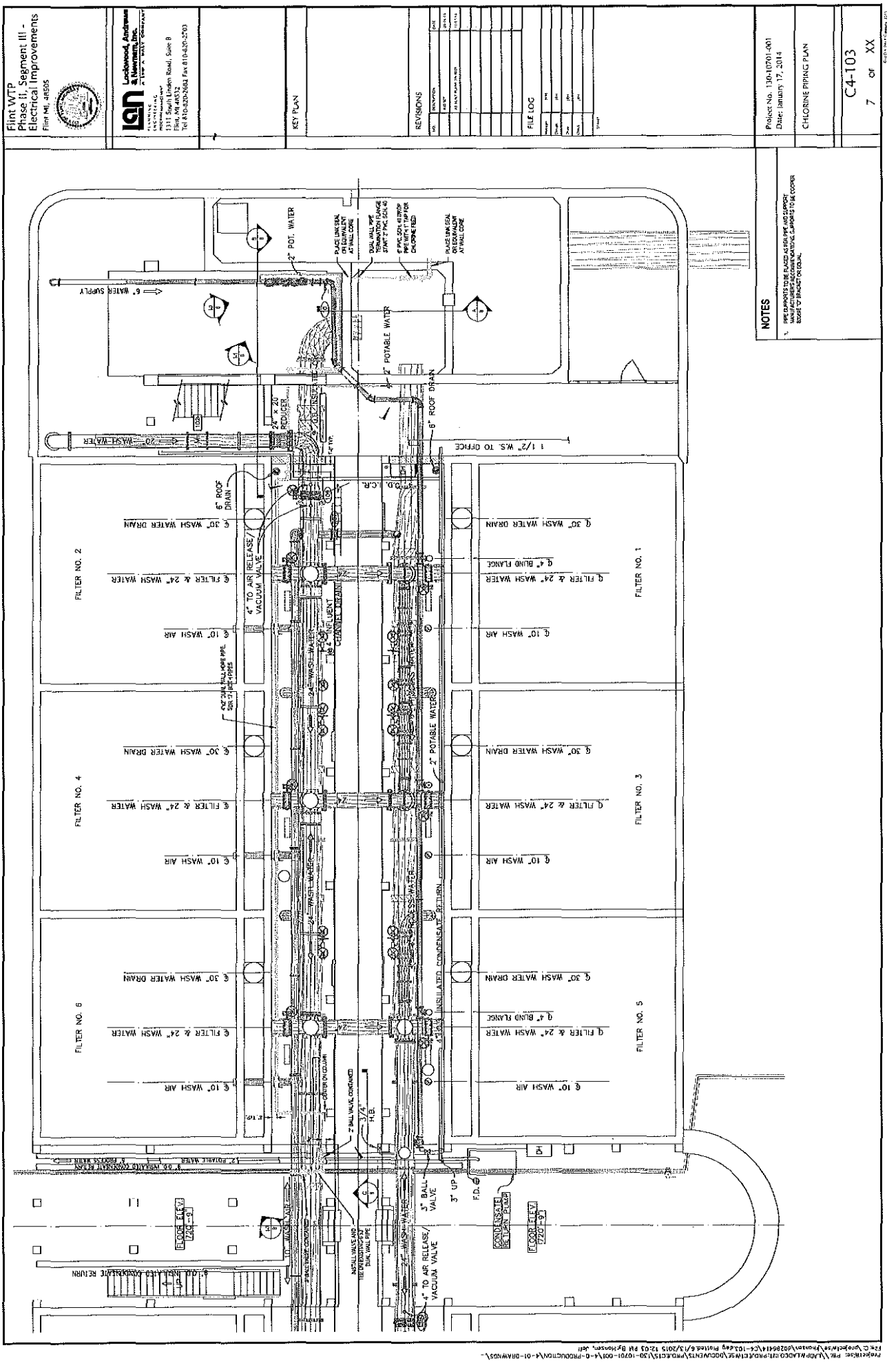
FILTER PLAN & SECTIONS TYPICAL OF TWELVE

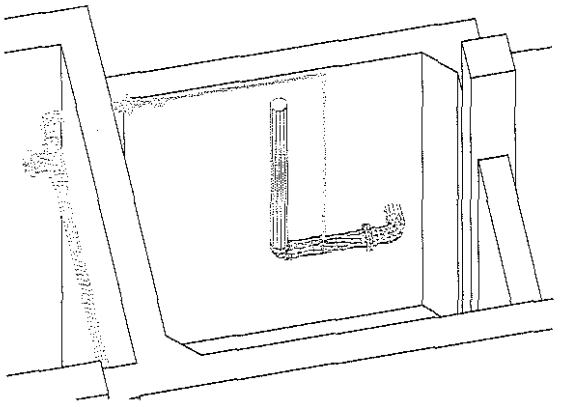
C4-102

6 OF XX

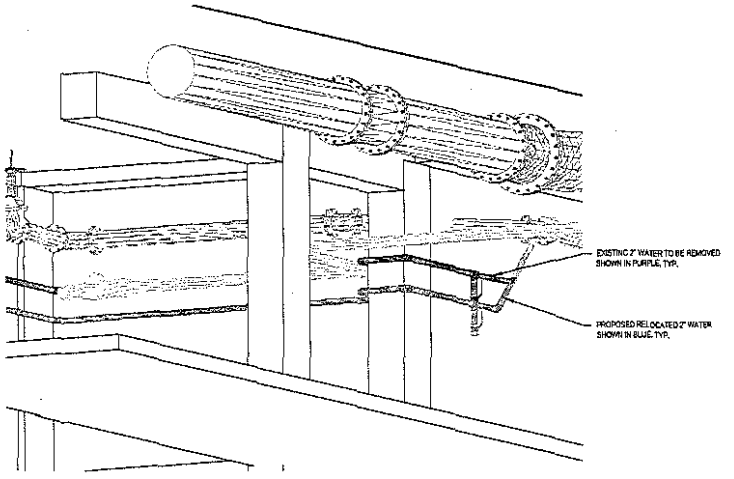
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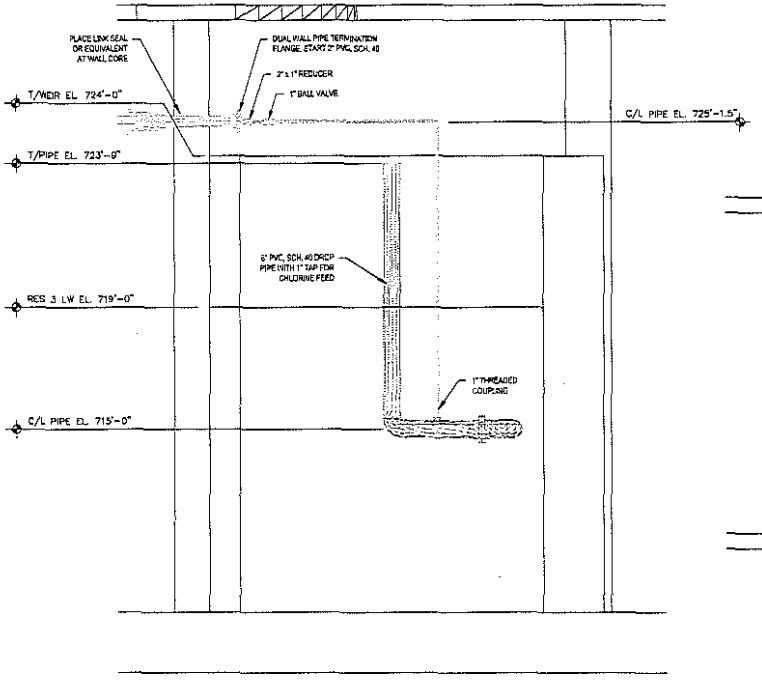

Flint WTP
Phase III, Segment III - Electrical Improvements
Flint MI, 48505
Lockwood, Andrews & Newnam, Inc.
A TEAM A WALT COMPANY
1311 South Linden Road, Suite B
Flint, MI 48532
Tel 810-820-2662 Fax 810-820-2703
KEY PLAN
REVISIONS
FILE LOG
Project No. 130-10701-001
Date: January 17, 2014
CHLORINE PIPING PLAN
C4-103
7 of XX
NOTES
1. PIPE SUPPORTS TO BE PLACED AFTER PIPE AND SUPPORT MANUFACTURER HAS APPROVED INSTALLATION. SUPPORTS TO BE COPPER BOSHE "U" BRACKET OR EQUAL.
FILTER NO. 1
FILTER NO. 2
FILTER NO. 3
FILTER NO. 4
FILTER NO. 5
FILTER NO. 6
2" POT. WATER
2" POTABLE WATER
6" WATER SUPPLY
6" ROOF DRAIN
24" x 20" REDUCER
1 1/2" W.S. TO OFFICE
20" WASH WATER
12" POTABLE WATER
8" INSULATED CONDENSATE RETURN
12" WASH WATER
10" WASH AIR
4" TO AIR RELEASE/ VACUUM VALVE
3" BALL VALVE
3" UP
F.D.
CONDENSATE RETURN PUMP
FLOOR ELEV. 720'-9"
FLOOR ELEV. 729'-9"
INSTALL VALVE AND TEE PERPENDICULAR TO DUAL WALL PIPE
2" BALL VALVE (TYP.)
3/4" H.B.
DUAL WALL PIPE TRANSITION FLANGE (FIRST 5' PVC SCH 80)
PLACE LINK SEAL OR EQUIVALENT AT WALL CORE
5' PVC SCH 40 STOP VALVE FOR CHLORINE FEED
Project No: P:\Lockwood\Projects\J029644\C4-103.dwg Plotted: 6/13/2015 12:03 PM By thomsen, jeff
File: C:\Projects\Projects\J029644\C4-103.dwg Plotted: 6/13/2015 12:03 PM By thomsen, jeff



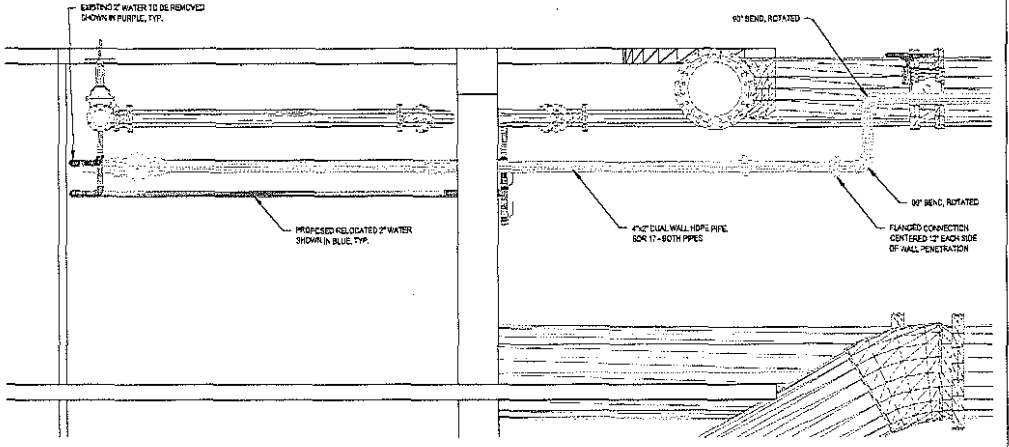
1-1 CHLORINE PIPING ISOMETRIC
SCALE: 1/2" = 1'-0"



1-2 CHLORINE PIPING ISOMETRIC
SCALE: 1/2" = 1'-0"



A CHLORINE PIPING SECTION
SCALE: 1/2" = 1'-0"



B CHLORINE PIPING SECTION
SCALE: 1/2" = 1'-0"

Flint WTP
Phase II, Segment III - Electrical Improvements
Flint MI, 48505

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

KEY PLAN

REVISIONS

NO	DESCRIPTION	DATE

FILE LOG

Designed	
Drawn	
Checked	

Project No. 130-10701-001
Date: January 17, 2014

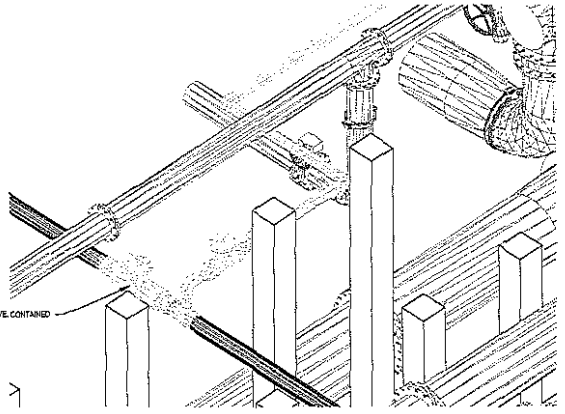
CHLORINE SECTIONS & DETAILS

C4-501

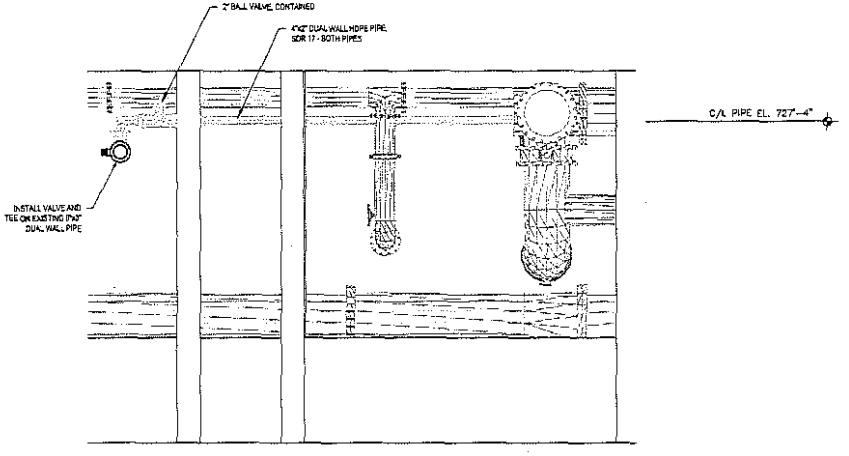
8 OF XX

005749

Project Water File: \\LAN-FLINT-SVR\Projects\130-10701-001\4-0 PRODUCTION\4-01 DRAWINGS\C4-501.dwg Plotted: 6/13/2015 12:07 PM By: Hoover, Jeff



I-3 **CHLORINE PIPING ISOMETRIC**
SCALE: 1/2" = 1'-0"



C **CHLORINE PIPING SECTION**
SCALE: 1/2" = 1'-0"

Flint WTP
Phase II, Segment III - Electrical Improvements
Flint MI, 48505

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

KEY PLAN

REVISIONS

NO	DESCRIPTION	DATE
	ADDIT	
	ADDIT PLANS (IN RED)	

FILE LOG

Manager	SPM
Design	JRH
Draw	JRH
Check	
QA/QC	

Project No. 130-10701-001
Date: January 17, 2014

CHLORINE SECTIONS & DETAILS

C4-502

9 OF XX

005750

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File C:\projectdata\Phases\V02884\V4-502.dwg Plotted: 6/10/2015 12:24 PM By: Hansen, Jeff

Rennaker, Joanne (DEQ)

From:	Krisztian, George (DEQ)
Sent:	Wednesday, October 28, 2015 4:53 PM
To:	Sygo, Jim (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Cc:	Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ)
Subject:	Flint Home Owner's Lead data thru October 28, 2015
Attachments:	Flint Home Owners Data Thru October 28,2015.xlsx

Attached is the latest data for Homeowner's in Flint. The spreadsheet includes samples submitted to the DEQ Lab from September 3rd thru October 26th.

- Of the 306 samples, 238 (77.7%) were at levels of 5ppb and lower for lead
- The 90th percentile value is 10 ppb

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

SAMPNO	Contact	SUBDATE	ACODE	RESULT
LF84899	MIKE GLASGOW	25-Sep-15	PB	0.000
LF85330	MIKE GLASGOW	29-Sep-15	PB	0.000
LF85604	MIKE GLASGOW	30-Sep-15	PB	0.000
LF85613	MIKE GLASGOW	30-Sep-15	PB	0.000
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LF87402	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87409	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87414	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87425	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87430	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87436	MIKE GLASGOW	13-Oct-15	PB	0.003
LF87947	MIKE GLASGOW	16-Oct-15	PB	0.003
LF88957	MIKE GLASGOW	26-Oct-15	PB	0.003
LF82708	MIKE GLASGOW	15-Sep-15	PB	0.004
LF85603	MIKE GLASGOW	30-Sep-15	PB	0.004
LF85609	MIKE GLASGOW	30-Sep-15	PB	0.004
LF85615	MIKE GLASGOW	30-Sep-15	PB	0.004
LF85944	MIKE GLASGOW	02-Oct-15	PB	0.004
LF85953	MIKE GLASGOW	02-Oct-15	PB	0.004
LF87010	MIKE GLASGOW	08-Oct-15	PB	0.004
LF87057	MIKE GLASGOW	08-Oct-15	PB	0.004
LF87387	MIKE GLASGOW	13-Oct-15	PB	0.004
LF87421	MIKE GLASGOW	13-Oct-15	PB	0.004
LF87435	MIKE GLASGOW	13-Oct-15	PB	0.004
LF87943	MIKE GLASGOW	16-Oct-15	PB	0.004
LF88301	MIKE GLASGOW	20-Oct-15	PB	0.004
LF88320	MIKE GLASGOW	20-Oct-15	PB	0.004
LF88949	MIKE GLASGOW	26-Oct-15	PB	0.004
LF88951	MIKE GLASGOW	26-Oct-15	PB	0.004

LF88955	MIKE GLASGOW	26-Oct-15	PB	0.004
LF88961	MIKE GLASGOW	26-Oct-15	PB	0.004
LF82706	MIKE GLASGOW	15-Sep-15	PB	0.005
LF84314	MIKE GLASGOW	23-Sep-15	PB	0.005
LF85856	MIKE GLASGOW	01-Oct-15	PB	0.005
LF85863	MIKE GLASGOW	01-Oct-15	PB	0.005
LF85943	MIKE GLASGOW	02-Oct-15	PB	0.005
LF87011	MIKE GLASGOW	08-Oct-15	PB	0.005
LF87019	MIKE GLASGOW	08-Oct-15	PB	0.005
LF87062	MIKE GLASGOW	08-Oct-15	PB	0.005
LF87374	MIKE GLASGOW	13-Oct-15	PB	0.005
LF87388	MIKE GLASGOW	13-Oct-15	PB	0.005
LF87412	MIKE GLASGOW	13-Oct-15	PB	0.005
LF87931	MIKE GLASGOW	16-Oct-15	PB	0.005
LF87936	MIKE GLASGOW	16-Oct-15	PB	0.005
LF87941	MIKE GLASGOW	16-Oct-15	PB	0.005
LF87945	MIKE GLASGOW	16-Oct-15	PB	0.005
LF88311	MIKE GLASGOW	20-Oct-15	PB	0.005
LF88972	MIKE GLASGOW	26-Oct-15	PB	0.005
LF84898	MIKE GLASGOW	25-Sep-15	PB	0.006
LF85290	MIKE GLASGOW	29-Sep-15	PB	0.006
LF85602	MIKE GLASGOW	30-Sep-15	PB	0.006
LF85801	MIKE GLASGOW	01-Oct-15	PB	0.006
LF85859	MIKE GLASGOW	01-Oct-15	PB	0.006
LF87009	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87021	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87042	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87043	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87048	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87056	MIKE GLASGOW	08-Oct-15	PB	0.006
LF87385	MIKE GLASGOW	13-Oct-15	PB	0.006
LF87407	MIKE GLASGOW	13-Oct-15	PB	0.006
LF88282	MIKE GLASGOW	20-Oct-15	PB	0.006
LF84315	MIKE GLASGOW	23-Sep-15	PB	0.007
LF85798	MIKE GLASGOW	01-Oct-15	PB	0.007
LF85940	MIKE GLASGOW	02-Oct-15	PB	0.007
LF85955	MIKE GLASGOW	02-Oct-15	PB	0.007
LF87036	MIKE GLASGOW	08-Oct-15	PB	0.007
LF87375	MIKE GLASGOW	13-Oct-15	PB	0.007
LF87389	MIKE GLASGOW	13-Oct-15	PB	0.007
LF87406	MIKE GLASGOW	13-Oct-15	PB	0.007
LF88322	MIKE GLASGOW	20-Oct-15	PB	0.007
LF85286	MIKE GLASGOW	29-Sep-15	PB	0.008
LF87018	MIKE GLASGOW	08-Oct-15	PB	0.008
LF87034	MIKE GLASGOW	08-Oct-15	PB	0.008
LF87038	MIKE GLASGOW	08-Oct-15	PB	0.008
LF87928	MIKE GLASGOW	16-Oct-15	PB	0.008
LF88279	MIKE GLASGOW	20-Oct-15	PB	0.008
LF88289	MIKE GLASGOW	20-Oct-15	PB	0.008
LF85949	MIKE GLASGOW	02-Oct-15	PB	0.009
LF85956	MIKE GLASGOW	02-Oct-15	PB	0.009
LF87060	MIKE GLASGOW	08-Oct-15	PB	0.009
LF87065	MIKE GLASGOW	08-Oct-15	PB	0.009
LF85289	MIKE GLASGOW	29-Sep-15	PB	0.010
LF85941	MIKE GLASGOW	02-Oct-15	PB	0.010

LF87008	MIKE GLASGOW	08-Oct-15	PB	0.010
LF87401	MIKE GLASGOW	13-Oct-15	PB	0.010
LF87937	MIKE GLASGOW	16-Oct-15	PB	0.010
LF85929	MIKE GLASGOW	02-Oct-15	PB	0.011
LF87052	MIKE GLASGOW	08-Oct-15	PB	0.011
LF87939	MIKE GLASGOW	16-Oct-15	PB	0.011
LF85607	MIKE GLASGOW	30-Sep-15	PB	0.012
LF85287	MIKE GLASGOW	29-Sep-15	PB	0.013
LF87429	MIKE GLASGOW	13-Oct-15	PB	0.013
LF87373	MIKE GLASGOW	13-Oct-15	PB	0.014
LF88287	MIKE GLASGOW	20-Oct-15	PB	0.015
LF87940	MIKE GLASGOW	16-Oct-15	PB	0.016
LF87366	MIKE GLASGOW	13-Oct-15	PB	0.017
LF87396	MIKE GLASGOW	13-Oct-15	PB	0.017
LF85935	MIKE GLASGOW	02-Oct-15	PB	0.018
LF85329	MIKE GLASGOW	29-Sep-15	PB	0.019
LF87390	MIKE GLASGOW	13-Oct-15	PB	0.019
LF84316	MIKE GLASGOW	23-Sep-15	PB	0.020
LF87416	MIKE GLASGOW	13-Oct-15	PB	0.020
LF87399	MIKE GLASGOW	13-Oct-15	PB	0.021
LF88307	MIKE GLASGOW	20-Oct-15	PB	0.026
LF87403	MIKE GLASGOW	13-Oct-15	PB	0.027
LF81253	MIKE GLASGOW	03-Sep-15	PB	0.028
LF85948	MIKE GLASGOW	02-Oct-15	PB	0.030
LF88954	MIKE GLASGOW	26-Oct-15	PB	0.036
LF85860	MIKE GLASGOW	01-Oct-15	PB	0.041
LF87040	MIKE GLASGOW	08-Oct-15	PB	0.074
LF85611	MIKE GLASGOW	30-Sep-15	PB	0.075
LF87426	MIKE GLASGOW	13-Oct-15	PB	0.078
LF88300	MIKE GLASGOW	20-Oct-15	PB	0.088
LF88960	MIKE GLASGOW	26-Oct-15	PB	0.131
LF84897	MIKE GLASGOW	25-Sep-15	PB	0.327

REPADD1	REPADD2	REPADD3	INVADD1	INVADD2	INVADD3
4500 N DORT HWY		FLINT	1930	FLINT	48503
4500 N DORT HWY		FLINT	1505 W	FLINT	48503
4500 N DORT HWY		FLINT	605	FLINT	48503
4500 N DORT HWY		FLINT	4307	FLINT	48507
4500 N DORT HWY		FLINT	2422	FLINT	48504
4500 N DORT HWY		FLINT	3729	FLINT	48506
4500 N DORT HWY		FLINT	3617	FLINT	48506
4500 N DORT HWY		FLINT	1222	FLINT	48507
4500 N DORT HWY		FLINT	605	FLINT	48503
4500 N DORT HWY		FLINT	1359	FLINT	48504
4500 N DORT HWY		FLINT	3701 N	FLINT	48506
4500 N DORT HWY		FLINT	1359	FLINT	48504
4500 N DORT HWY		FLINT	G3139	FLINT	48532
4500 N DORT HWY		FLINT	G3139	FLINT	48532
4500 N DORT HWY		FLINT	23009	FLINT	48503
4500 N DORT HWY		FLINT	1001	FLINT	48503
4500 N DORT HWY		FLINT	2309	FLINT	48503
4500 N DORT HWY		FLINT	G3376	FLINT	
4500 N DORT HWY		FLINT	1107 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	2013	FLINT	48506
4500 N DORT HWY		FLINT	3447 BARTH	FLINT	48504
4500 N DORT HWY		FLINT	2309	FLINT	48506
4500 N DORT HWY		FLINT	3701	FLINT	48506
4500 N DORT HWY		FLINT	3807 N	FLINT	48506
4500 N DORT HWY		FLINT	3310 E	FLINT	48506
4500 N DORT HWY		FLINT	5813	FLINT	48504
4500 N DORT HWY		FLINT	3810	FLINT	48532
4500 N DORT HWY		FLINT			
4500 N DORT HWY		FLINT	1101 S	FLINT	48502
4500 N DORT HWY		FLINT	3713	FLINT	48506
4500 N DORT HWY		FLINT	4123	FLINT	48506
4500 N DORT HWY		FLINT	4500 N	FLINT	48505
4500 N DORT HWY		FLINT	3514	FLINT	48503
4500 N DORT HWY		FLINT	336	FLINT	
4500 N DORT HWY		FLINT	1160	FLINT	48504
4500 N DORT HWY		FLINT	414	FLINT	48503
4500 N DORT HWY		FLINT	3800	FLINT	
4500 N DORT HWY		FLINT	822 FRANK	FLINT	48504
4500 N DORT HWY		FLINT	2516	FLINT	48504
4500 N DORT HWY		FLINT	3224 N	FLINT	48506
4500 N DORT HWY		FLINT	3741 JOAL	FLINT	48506
4500 N DORT HWY		FLINT	1401	FLINT	48503
4500 N DORT HWY		FLINT	902 E	FLINT	48503
4500 N DORT HWY		FLINT	820	FLINT	48505
4500 N DORT HWY		FLINT	1160	FLINT	48504

4500 N DORT HWY		FLINT	518 MASON	FLINT	48503
4500 N DORT HWY		FLINT	4060	FLINT	
4500 N DORT HWY		FLINT	1705	FLINT	48507
4500 N DORT HWY		FLINT	2010	FLINT	48504
4500 N DORT HWY		FLINT	906	FLINT	48505
4500 N DORT HWY		FLINT	422	FLINT	48503
4500 N DORT HWY		FLINT	3248	FLINT	48504
4500 N DORT HWY		FLINT	2306	FLINT	48503
4500 N DORT HWY		FLINT	3730	FLINT	48506
4500 N DORT HWY		FLINT	932	FLINT	48507
4500 N DORT HWY		FLINT	5714	FLINT	
4500 N DORT HWY		FLINT	555 S	FLINT	48502
4500 N DORT HWY		FLINT	1002	FLINT	48507
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	119 N	FLINT	48503
4500 N DORT HWY		FLINT	987	FLINT	48532
4500 N DORT HWY		FLINT	3813	FLINT	48507
4500 N DORT HWY		FLINT	5905	FLINT	48504
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	3813	FLINT	48507
4500 N DORT HWY		FLINT	317 W	FLINT	
4500 N DORT HWY		FLINT	3821	FLINT	48507
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	3510	FLINT	48506
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	3813	FLINT	48507
4500 N DORT HWY		FLINT	1549 E	FLINT	48507
4500 N DORT HWY		FLINT	4025	FLINT	48507
4500 N DORT HWY		FLINT	3709	FLINT	48532
4500 N DORT HWY		FLINT	3813	FLINT	48507
4500 N DORT HWY		FLINT	914	FLINT	48503
4500 N DORT HWY		FLINT	2761	FLINT	48503
4500 N DORT HWY		FLINT	618 E	FLINT	48505
4500 N DORT HWY		FLINT	705	FLINT	48503
4500 N DORT HWY		FLINT	125 E	FLINT	48502
4500 N DORT HWY		FLINT	418 W	FLINT	48505
4500 N DORT HWY		FLINT	819	FLINT	48503
4500 N DORT HWY		FLINT	3705	FLINT	48506
4500 N DORT HWY		FLINT	4219	FLINT	48504
4500 N DORT HWY		FLINT	533	FLINT	48507
4500 N DORT HWY		FLINT	1005	FLINT	48503
4500 N DORT HWY		FLINT	736	FLINT	48507
4500 N DORT HWY		FLINT	3001 HENRY	FLINT	48506
4500 N DORT HWY		FLINT	2818	FLINT	48506
4500 N DORT HWY		FLINT	1107 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503

4500 N DORT HWY		FLINT	318 BEDE ST	FLINT	48507
4500 N DORT HWY		FLINT	2701	FLINT	48506
4500 N DORT HWY		FLINT	3807 N	FLINT	48506
4500 N DORT HWY		FLINT	1809	FLINT	48503
4500 N DORT HWY		FLINT	3610	FLINT	48506
4500 N DORT HWY		FLINT	1101 S	FLINT	48502
4500 N DORT HWY		FLINT	4910	FLINT	48505
4500 N DORT HWY		FLINT	6707	FLINT	48505
4500 N DORT HWY		FLINT	2565	FLINT	48504
4500 N DORT HWY		FLINT	1920	FLINT	48503
4500 N DORT HWY		FLINT	1221 S	FLINT	
4500 N DORT HWY		FLINT	714 ELLAND	FLINT	
4500 N DORT HWY		FLINT	924 BARRIE	FLINT	48507
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	422 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	1700 S	FLINT	48504
4500 N DORT HWY		FLINT	1856 S	FLINT	48503
4500 N DORT HWY		FLINT	341	FLINT	48507
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	801	FLINT	48503
4500 N DORT HWY		FLINT	225 W	FLINT	48503
4500 N DORT HWY		FLINT	1201	FLINT	48503
4500 N DORT HWY		FLINT	1001	FLINT	48504
4500 N DORT HWY		FLINT	1025	FLINT	48503
4500 N DORT HWY		FLINT		FLINT	
4500 N DORT HWY		FLINT	3513	FLINT	48506
4500 N DORT HWY		FLINT	704	FLINT	48503
4500 N DORT HWY		FLINT	2607	FLINT	48504
4500 N DORT HWY		FLINT	401	FLINT	48507
4500 N DORT HWY		FLINT	1939	FLINT	48507
4500 N DORT HWY		FLINT	2426	FLINT	48504
4500 N DORT HWY		FLINT	2708	FLINT	48503
4500 N DORT HWY		FLINT	4214	FLINT	48504
4500 N DORT HWY		FLINT	612 E 3RD	FLINT	48503
4500 N DORT HWY		FLINT	G3139	FLINT	48532
4500 N DORT HWY		FLINT	927	FLINT	48503
4500 N DORT HWY		FLINT	540 S	FLINT	48502
4500 N DORT HWY		FLINT	3106	FLINT	48504
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	211 W	FLINT	48503
4500 N DORT HWY		FLINT	337	FLINT	48507
4500 N DORT HWY		FLINT	901 W	FLINT	48503
4500 N DORT HWY		FLINT	1305	FLINT	48502
4500 N DORT HWY		FLINT	2938	FLINT	48503
4500 N DORT HWY		FLINT	3409 SANTA	FLINT	48504
4500 N DORT HWY		FLINT	3214 N	FLINT	48506
4500 N DORT HWY		FLINT	360	FLINT	48507
4500 N DORT HWY		FLINT	3840	FLINT	48503
4500 N DORT HWY		FLINT	1310	FLINT	48504
4500 N DORT HWY		FLINT	3156	FLINT	48506
4500 N DORT HWY		FLINT	3200	FLINT	48506
4500 N DORT HWY		FLINT	1805	FLINT	48503

4500 N DORT HWY		FLINT	359	FLINT	48507
4500 N DORT HWY		FLINT	1622 E	FLINT	48506
4500 N DORT HWY		FLINT	3011 N	FLINT	48506
4500 N DORT HWY		FLINT	1906 E	FLINT	48503
4500 N DORT HWY		FLINT	116 W	FLINT	48503
4500 N DORT HWY		FLINT	2302	FLINT	48503
4500 N DORT HWY		FLINT	929	FLINT	48502
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	1914	FLINT	48507
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	1409	FLINT	
4500 N DORT HWY		FLINT	2820 S	FLINT	48503
4500 N DORT HWY		FLINT	325	FLINT	48503
4500 N DORT HWY		FLINT	726	FLINT	48503
4500 N DORT HWY		FLINT	502 CRAPO	FLINT	48503
4500 N DORT HWY		FLINT	3216	FLINT	48503
4500 N DORT HWY		FLINT	926	FLINT	48503
4500 N DORT HWY		FLINT	528 S	FLINT	48503
4500 N DORT HWY		FLINT	1206	FLINT	48503
4500 N DORT HWY		FLINT	2207 HILLS	FLINT	48503
4500 N DORT HWY		FLINT	3014	FLINT	48504
4500 N DORT HWY		FLINT	1002	FLINT	48503
4500 N DORT HWY		FLINT	2131	FLINT	48503
4500 N DORT HWY		FLINT	2602	FLINT	48507
4500 N DORT HWY		FLINT	1651 N	FLINT	48503
4500 N DORT HWY		FLINT	1901 E 2ND	FLINT	48503
4500 N DORT HWY		FLINT	3709	FLINT	48506
4500 N DORT HWY		FLINT	423 S	FLINT	48503
4500 N DORT HWY		FLINT	3010	FLINT	48506
4500 N DORT HWY		FLINT	3719 KENT	FLINT	48503
4500 N DORT HWY		FLINT	1830	FLINT	48503
4500 N DORT HWY		FLINT	2250	FLINT	48504
4500 N DORT HWY		FLINT	340	FLINT	
4500 N DORT HWY		FLINT	1106	FLINT	48503
4500 N DORT HWY		FLINT	1025 E	FLINT	
4500 N DORT HWY		FLINT	2020	FLINT	48504
4500 N DORT HWY		FLINT	801 FLORAL	FLINT	48503
4500 N DORT HWY		FLINT	3110	FLINT	48503
4500 N DORT HWY		FLINT	3901	FLINT	48507
4500 N DORT HWY		FLINT	914	FLINT	48503
4500 N DORT HWY		FLINT	605	FLINT	48503
4500 N DORT HWY		FLINT	125 E	FLINT	48502
4500 N DORT HWY		FLINT	2717	FLINT	48504
4500 N DORT HWY		FLINT	932	FLINT	48503
4500 N DORT HWY		FLINT	1006	FLINT	48503
4500 N DORT HWY		FLINT	3106	FLINT	48504
4500 N DORT HWY		FLINT	629	FLINT	48507
4500 N DORT HWY		FLINT	1001	FLINT	48503
4500 N DORT HWY		FLINT	UNKNOWN	FLINT	
4500 N DORT HWY		FLINT	1025 E	FLINT	48503
4500 N DORT HWY		FLINT	1602	FLINT	48503
4500 N DORT HWY		FLINT	535 LETA	FLINT	48507
4500 N DORT HWY		FLINT	2115	FLINT	48503
4500 N DORT HWY		FLINT	2413	FLINT	48504
4500 N DORT HWY		FLINT	225 W	FLINT	48503

4500 N DORT HWY		FLINT	829	FLINT	48503
4500 N DORT HWY		FLINT	1006 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	2553	FLINT	48503
4500 N DORT HWY		FLINT	2616	FLINT	48507
4500 N DORT HWY		FLINT	1308	FLINT	48503
4500 N DORT HWY		FLINT	904 E 7TH	FLINT	48503
4500 N DORT HWY		FLINT	1210	FLINT	48503
4500 N DORT HWY		FLINT	1112 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	501 W	FLINT	
4500 N DORT HWY		FLINT	2309	FLINT	48507
4500 N DORT HWY		FLINT	311 S	FLINT	48503
4500 N DORT HWY		FLINT	3123	FLINT	48507
4500 N DORT HWY		FLINT	924	FLINT	48507
4500 N DORT HWY		FLINT	913	FLINT	48503
4500 N DORT HWY		FLINT	1728	FLINT	48503
4500 N DORT HWY		FLINT	514	FLINT	48504
4500 N DORT HWY		FLINT	1110	FLINT	48507
4500 N DORT HWY		FLINT	1118	FLINT	48507
4500 N DORT HWY		FLINT	555	FLINT	48503
4500 N DORT HWY		FLINT	5602	FLINT	48505
4500 N DORT HWY		FLINT	1213 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	218	FLINT	48503
4500 N DORT HWY		FLINT	1126	FLINT	48503
4500 N DORT HWY		FLINT	2721	FLINT	48503
4500 N DORT HWY		FLINT	719	FLINT	48503
4500 N DORT HWY		FLINT	725	FLINT	48503
4500 N DORT HWY		FLINT	2925	FLINT	48503
4500 N DORT HWY		FLINT	1820	FLINT	48506
4500 N DORT HWY		FLINT	2018	FLINT	48504
4500 N DORT HWY		FLINT	3702	FLINT	48506
4500 N DORT HWY		FLINT	3622	FLINT	48503
4500 N DORT HWY		FLINT	2101	FLINT	48504
4500 N DORT HWY		FLINT	1310	FLINT	48503
4500 N DORT HWY		FLINT	1422	FLINT	48503
4500 N DORT HWY		FLINT	2430	FLINT	48504
4500 N DORT HWY		FLINT	602 W	FLINT	48505
4500 N DORT HWY		FLINT	1319 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	1013 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	2715	FLINT	48507
4500 N DORT HWY		FLINT	7002	FLINT	48505
4500 N DORT HWY		FLINT	705 SIMCOE	FLINT	48507
4500 N DORT HWY		FLINT	3330	FLINT	48503
4500 N DORT HWY		FLINT	841	FLINT	48504
4500 N DORT HWY		FLINT	839 W	FLINT	48505
4500 N DORT HWY		FLINT	333 BEDE ST	FLINT	48507
4500 N DORT HWY		FLINT	3013	FLINT	48503
4500 N DORT HWY		FLINT	613	FLINT	48503
4500 N DORT HWY		FLINT	2630	FLINT	48503
4500 N DORT HWY		FLINT	2529 N	FLINT	48504
4500 N DORT HWY		FLINT	927	FLINT	48503
4500 N DORT HWY		FLINT	1205	FLINT	48503
4500 N DORT HWY		FLINT	3917 RED	FLINT	48507
4500 N DORT HWY		FLINT		FLINT	
4500 N DORT HWY		FLINT	1426	FLINT	48506
4500 N DORT HWY		FLINT	1329	FLINT	48503

4500 N DORT HWY		FLINT	1112 BEARD	FLINT	48503
4500 N DORT HWY		FLINT	329 W	FLINT	48505
4500 N DORT HWY		FLINT	1201	FLINT	48507
4500 N DORT HWY		FLINT	3120	FLINT	48503
4500 N DORT HWY		FLINT	721 FRANK	FLINT	48504
4500 N DORT HWY		FLINT	1502 S	FLINT	48503
4500 N DORT HWY		FLINT	UNKNOWN	FLINT	
4500 N DORT HWY		FLINT	440 E	FLINT	48507
4500 N DORT HWY		FLINT	329 W	FLINT	48505
4500 N DORT HWY		FLINT	1302	FLINT	48507
4500 N DORT HWY		FLINT	1407	FLINT	48504
4500 N DORT HWY		FLINT	205 W	FLINT	48503
4500 N DORT HWY		FLINT	3200	FLINT	48506
4500 N DORT HWY		FLINT	2001 N	FLINT	48506
4500 N DORT HWY		FLINT	2708	FLINT	48503
4500 N DORT HWY		FLINT	ST JOHN	FLINT	
4500 N DORT HWY		FLINT	3613 LEITH	FLINT	48506
4500 N DORT HWY		FLINT	1614	FLINT	48503
4500 N DORT HWY		FLINT	3405	FLINT	
4500 N DORT HWY		FLINT	4301	FLINT	48507
4500 N DORT HWY		FLINT	3822	FLINT	48532
4500 N DORT HWY		FLINT	5838	FLINT	48505
4500 N DORT HWY		FLINT	1623	FLINT	48503
4500 N DORT HWY		FLINT	1210	FLINT	48503
4500 N DORT HWY		FLINT	225 W	FLINT	48503
4500 N DORT HWY		FLINT	2319	FLINT	48504
4500 N DORT HWY		FLINT	318	FLINT	48507
4500 N DORT HWY		FLINT	224	FLINT	48503
4500 N DORT HWY		FLINT	1220 E	FLINT	
4500 N DORT HWY		FLINT	2540 S	FLINT	48503
4500 N DORT HWY		FLINT	829 E	FLINT	48503
4500 N DORT HWY		FLINT	2801 YALE	FLINT	48503

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, April 24, 2014 9:25 AM
To: Busch, Stephen (DEQ)
Subject: Flint inspection - meeting

Steve,

As we discussed, I will visit the Flint WTP and the Bray Road site this afternoon to confirm that the remaining items discussed during last Friday's visit have been addressed and, more importantly, to confirm that the WTP is ready to distribute water to the Flint distribution system. For tomorrow's "switch-over ceremony", I will plan to drive separately to the WTP. The switch-over ceremony is at noon, so I plan on arriving between 11:30 – 11:45 timeframe. If there is any change in this schedule, I will inform you.

I will also complete and submit my timesheet today. I will make any modifications, as needed, on Monday to reflect earned comp time.

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, March 20, 2013 11:43 AM
To: Busch, Stephen (DEQ)
Subject: Flint KWA capacity

Daugherty,

This email confirms our discussion this morning concerning the possibility of modifying a resolution to purchase 18.0 million gallons per day (MGD) of raw water from the KWA to 15.0 MGD. The MDEQ does not concur with the potential reduction to 15.0 MGD of raw water. This volume of raw water will not be sufficient in meeting Flint's maximum day demands (MDD) and the MDEQ will not support a contract between Flint and the KWA that provides only 15.0 MGD of raw water. The MDEQ is also concerned that an 18.0 MGD contract will only be marginal in meeting Flint's MDD. Our concerns are based on the following:

- Flint's 5-year average day demand: 13.9 MDG
- Flint's 5-year max day demand: 21.6 MGD

Next, R 325.11204 (1) of the Michigan Safe Drinking Water Act, 1976 PA 399, as Amended and the Administrative Rules require a public water supply to provide sufficient capacity in the waterworks system to meet the finished water supply requirements and, in Flint's case, needs to consist of rated capacity from an approved surface water supply. Also, we are basing Flint's capacity needs are based on treated water; thus the capacity of available raw water will need to be slightly higher (2 to 3 percent) to account for the water needed for production at the treatment plant.

While we understand that Flint's population and water use has declined over the past 10 years, there are other important considerations for providing sufficient source capacity and these include:

- Flint has the potential to fill many existing industrial vacancies over the next 20 years. Additional capacity will be needed to meet this need.
- Potential permit bans and/or connection bans if MDD cannot be met
- Residential water reduction or water use restrictions measures if MDD cannot be met
- Flint needs to plan for future capacity requirements. Most future capacity plans allow for some increase in capacity to allow for expansion of residential, commercial, or industrial customer base

- Flint's 2011 Water Reliability Study's 2030 MDD is 24.0 MGD. This MDD is consistent with Flint's most recent water system Sanitary Survey prepared by the MDEQ.

If you have any questions concerning this matter, please call me at your earliest convenience.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122 - office
517 599-5437 – cell

Rennaker, Joanne (DEQ)

From: Kevin Sylvester <K_SYLVESTER@gcdcwws.com>
Sent: Wednesday, May 01, 2013 3:58 PM
To: Kevin Sylvester
Subject: Flint KWA Information
Attachments: Final KWA Decision.05.01.13.pdf

For those not able to attend the press conference today, attached is some information regarding Flint's decision to reject DWSD's final offer and instead partner with KWA.

If you need further information or have any questions please let me know.

Regards,

Kevin A. Sylvester
Communications Director
Genesee County Drain Commissioner's Office
ksylvester@gcdcwws.com
810-701-6514 - Mobile

GENESEE COUNTY DRAIN COMMISSIONER'S OFFICE
JEFFREY WRIGHT
COMMISSIONER
G-4608 BEECHER ROAD, FLINT, MI 48532
PHONE (810) 732-1590 FAX (810) 732-1474

May 1, 2013

To All Interested Parties:

As announced earlier this week by Governor Snyder's office, the City of Flint confirmed in a press conference today that they are rejecting the final offer submitted by DWSD, and are moving forward as a partner with KWA.

The decision for Flint to receive its' drinking water from KWA has now been vetted by the Department of Treasury, Department of Agriculture, and Department of Environmental Quality (DEQ).

Attached are documents relating to the decision, providing reasoning to why KWA is the best financial option for both Flint and Genesee County. Construction is expected to begin in late May or early June.

If you have any questions pertaining to this issue, please feel free to contact me at ksylvester@gcdcwws.com or 810-701-6514.

Regards,

Kevin A. Sylvester
Communications Director
Genesee County Drain Commissioner's Office

EM Press Briefing For Week of 5/01/2013

KWA vs. DWSD Facts & Figures

- The Karegnondi Water Authority (KWA) is regional water authority that would provide raw water to Flint and Genesee County via a direct pipeline.
- This offer has more risk involved than previous proposals. KWA would be responsible for between 20% and 100% of the repair costs on the pipeline and related assets from Port Huron
- The numbers in the offer do not make sense. DWSD indicates savings of over $900 million while KWA's total cost over 30 years is less than $650 million.
- Offer is based on very little capital improvements, no repairs and a 4.7% annual increase over the life of the contract.
- There are no rate guarantees after the first year for capital, O & M or consumption.
- KWA would be responsible for redundancy at a cost of $94.68 million per DWSD's estimate.
- Does not guarantee a rate structure if system regionalizes or DWSD regionalizes, or Detroit enters bankruptcy.
- Flint and Genesee County could have a connected waste/water system that serves all or part of five counties.
- The potential for further consolidation of services between the city and the county i.e...water, wastewater, 911, etc,
- This partnership will give Flint ownership of the city's own water supply system with real representation on its board of directors, making all treatment and delivery system decisions.
- Flint's participation allows the city to utilize its own water treatment facility that it has invested $50 million into and only currently exercises four weeks per year.
- The investment gives Flint and Genesee County a new pipeline with a life expectancy of 75 years, as well as a 2nd product, untreated water. Under DWSD we would have no ownership after the end of the contract, and a new pipeline would still need to be built.

EM Press Briefing For Week of 5/01/2013

- A 30 year contract with DWSD keeps Flint and Genesee County on a system that is 48 years old with a design life of 75 years. There will be necessary major investments or replacement costs that are not accounted for in this DWSD proposal.
- KWA guarantees its capitol rate for 25 years. The capitol rate is 90 % of the total costs.
- The commodity charge of $1.30 per MCF is mainly driven by energy costs. The whole operation will employ 5-7 people.
- A thirty year contract with DWSD will lock Flint into hundreds of employees, labor costs and legacy costs.
- The combination of low financing, labor and material make this the optimal time for this investment. At our meeting with the governor on April 19th Detroit acknowledged a second pipeline had to be built.
- KWA could be used as a backup emergency supply for the existing 48 year old pipeline.
- It brings a total economic package to our community i.e. We have the I-69 corridor, I-75 interchange, the rail system connected to Port Huron, and one of the busiest airports in the state. Owning our own water supply completes that package and keeps $25 million in our community.
- Mr. Fausone's continued insistence on a 12 month timeline to calculate the termination fees leaves a question mark on the costs.

EM Press Briefing For Week of 5/01/2013

Construction Costs

- **Rowe/AECOM/J & H** $272,000,000
- **TYJT** $357,000,000

  Include: 10% bond coverage (dispelled)

  30% additional engineering (dispelled)

  Back-up power (dispelled)

- **DWSD** Starts at: $357,000,000 and adds:

  $134,360,000 for bond sizing

  $11,074,500 for bond sale cost

  For a total of $503,274,500

  Plus need to collect $6,984,000 per year extra for bond coverage 20%)

Now KWA needs:

20% bond coverage

30% additional engineering

38% bond sizing

The KWA dispelled TYJT's numbers; now DWSD starts with those numbers and adds more. They add the same costs to Flint and GCDC construction costs (baseline figures and assumptions – KWA).

Baseline Figures and Assumptions - KWA Scenario

	DWSD Water Rate Structure			
	Fixed	Standby	Commodity	
2014	738,006	#N/A	13.01	Service ceases after 2016

Total Water Service Costs for Flint / Genesee County Drain Commission

Costs of Current Facilities / Operations

Same as DWSD scenario

Costs of Future Facilities / Operations

Financing Costs for New Projects	Flint WTP Improvements	GCDC WTP and Other	KWA System (a)
Project Cost	7,100,000	110,038,554	357,578,060
Bond Sizing Factor	37.65%	37.65%	37.65%
Additional Bond Proceeds Needed	2,670,000	41,430,000	134,630,000
Bond Sale Size	9,800,000	151,500,000	492,200,000
Bond Issuance Expenses - %	2.25%	2.25%	2.25%
Bond Issuance Expenses	220,500	3,408,800	11,074,500
Finance Rate	5.00%	5.00%	5.00%
Finance Term	25	25	25
Bond Reserve Size - %	10.00%	10.00%	10.00%
Bond Reserve Size	980,000	15,150,000	49,220,000
Capitalized Interest term - years	3	3	3
Capitalized Interest	1,470,000	22,725,000	73,830,000
Net Bond Proceeds	7,129,500	110,216,200	358,075,500
Annual Debt Service Payment	695,300	10,749,300	34,922,800
Debt Service Coverage Requirement	120.00%	120.00%	120.00%
Annual Debt Service Coverage	139,100	2,149,900	6,984,600
Replacement?	144,900	2,251,600	(b)
Total Capital Financing Revenue Req't	979,300	15,150,800	41,907,400
Operating Cost Estimate Starting in FY 2017	8,270,000	1,819,900	(c)

(a) excludes raw water reservoir
(b) assume no annual replacement required for pipeline
(c) $1.30 per Mcf inflated to 2017

KWA Construction

Cost Comparison

Description	KWA Estimate	TYT Estimate
Intake/Crib	$ 27,596,063	$ 27,596,063
Pump Stations	$ 30,772,600	$ 71,042,808
Transmission Mains	$ 207,752,895	$ 217,645,389
Power	$ 4,000,000	$ 4,000,000
Redundant Power for PS		$ 1,273,200
Land for LHPS	$ 2,300,000	$ 2,300,000
Design Engineering/PS and Transmission		$ 16,939,581
Construction Management		$ 14,434,410
Administration		$ 349,440
Legal/Easement/Contract Documents		$ 831,000
Easements		$ 1,166,170
Total	**$ 272,421,558**	**$ 357,578,060**
Flint Share @30%	**$81,726,467**	**$107,273,418**

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, July 14, 2015 3:34 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Bair, Rita
Subject: Flint lead sampling results?

Steve/Mike/Pat—Thank you for cluing me in to the fact that Liane and Tinka are talking about Flint next Tuesday. I guess it's just a manager discussion, from what I understand. I understand that Flint didn't get the minimum number of lead samples (100) for the second 6-month monitoring period that ended June 30, so I assume Flint is collecting the remaining samples now. Our Division Director, Tinka Hyde asked today if we will know what the lead results are from the second 6-month monitoring period. Perhaps you don't know what the results are for the remaining samples Flint began taking in July; but do you know what the other 80+ sample results are? Would you be able to share this information with us prior to the call on Tuesday? If not, Liane can share this info regarding the status of the sampling and the sample results with Tinka on Tuesday.

Thank you all for your hard work with Flint and with your management; I know this has not been an easy problem to deal with for anyone.

Jennifer

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, September 01, 2015 3:44 PM
To: Busch, Stephen (DEQ)
Subject: Flint Lead

Steve,

Ron Fonger left me a voicemail concerning questions he has concerning the lead issue in Flint. Specifically, he is aware of the increased discussion of lead in Flint's drinking water and the home tests recently performed at residents request in corroboration with V Tech and concerned groups. Ron discussed this issue w. Mr. Kroft and has the impression that the DEQ has had discussions with the city about the lead issue; however, Mr. Kroft declined to discuss the issue any further. Mr. Fonger wishes to discuss with the DEQ as to what discussions the DEQ has had with the city concerning the lead issue. Our only discussion (written) that I am aware of...is our 90% PB/CU letter sent to the city and the need for the city to install optimal corrosion control. Should I return his call or pass this on to Brad?

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, January 06, 2015 10:22 AM
To: Shekter Smith, Liane (DEQ); Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Willard, Veronica (DEQ)
Subject: Flint NBC News Interview - Flint TTHMs
Attachments: TTHM NBC Interview Jan 5, 2015.doc

Attached is a summary of the interview I had with Flint NBC 25 News late yesterday.....sorry this summary is late as I am receiving incoming calls from Flint residents...

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

Flint NBC 25 News Interview
Flint TTHMs
January 5, 2015

Walter-Smith Randolth, reporter, from Flint NBC 25 News conducted a telephone interview with me for broadcast on Flint local television concerning the TTHM violation in Flint's drinking water. I led the interview and provided Mr. Randolth an opportunity for follow-up questions. Below is a summary of topics that were presented.

<u>TTHM violation – What does this mean for Flint residents?</u> The TTHM violation notice to residents is not an immediate public health emergency since the health-effects posted in the notice require long-term exposure to TTHMs (over a significant portion of an individual's lifespan). TTHMs commonly occur in public water systems that disinfect with chorine due to the reaction between chlorine and naturally occurring organic compounds (total organic carbon) in the source water. Surface water sources, including the Flint River watershed, typically have higher levels of naturally occurring organic compounds.

<u>What is the DEQ's Role?</u> The DEQ is working in collaboration with the city to ensure long-term public health protection and to keep the public informed. We are working with the city to help identify improvements in treatment and operation of the distribution system to reduce the levels of TTHMs. We are assisting the city with public notice requirements (when to post/contents). With our assistance, the city has proceeded with an operational evaluation of the water system ahead of state and federal requirements.

<u>DEQ's perspective of the situation:</u> The Flint River source is more difficult to treat since it requires more disinfection to maintain bacteriological intergrity. Increased disinfection; however, when combined with higher levels of naturally occurring organics results in elevated levels of TTHMs that form over time out in the distribution system. The TTHM concentrations that developed in the system were more than anticipated due to several reasons:

1. **Flint did not immediately change their mode of distribution system operation after switching sources to account for higher TTHM formation potential of treated water from Flint's WTP.**

I explained that TTHMs require time to form and are not fully developed in the treated water that enters the distribution system from the WTP. Water from Detroit; however, is several days old when it reaches Flint; thus the majority of the TTHMs are developed. TTHMs were also lower given the source water (Lake Huron). Flint's historically operated the distribution system in a manner that created conditions favorable for stagnation. This methodology of operation was not changed (initially) when switching to the Flint River; thus, this condition was one of several factors contributing to higher levels of TTHMs. Other factors included; higher TTHM formation potential in the Flint River (already explained above) and higher chlorine application rates at treatment plant to maintain bacteriological integrity.

I further explained that TTHM levels in the most recent quarter have dropped for two main reasons:

1. **Action taken by the city including; improving dist. system operation to reduce stagnation, treatment changes (complete softening), reduced chorination, system flushing, valving improvements**

2. **Seasonal fluctuation of organic compounds in the Flint River. Less organic loading in the winter months.**

END of MY DISCUSSION

Mr. Smith-Randolf asked for my comment to the following questions/statements....Why this problem is occurring in Flint? Is there a problem with the water system? This was not an issue when Flint was on Detroit water.

I responded by summarizing some of the key points discussed above including:

- **Dist system operation (storage facilities and valving)**
- **TTHM formation potential in Flint River vs. Detroit and age of incoming water**
- **High chlorine dosages to maintain bacteriological integrity**
- **Treatment practices at WTP (partial by-pass of softening)**

Rennaker, Joanne (DEQ)

From:	Rosenthal, Adam (DEQ)
Sent:	Monday, July 20, 2015 4:54 PM
To:	Busch, Stephen (DEQ)
Cc:	Prysby, Mike (DEQ)
Subject:	Flint Pb 1st 1/2 2015

68 samples collected by 6/30/15.

90th = 11.4 ppb with 6 samples > AL.

waiting on a sample date for 3 more results, if collected w/in the monitoring period and are less than 10, the 90th would be 10 ppb.

Rennaker, Joanne (DEQ)

From: Groetsch, Kory J. (DCH)
Sent: Thursday, September 24, 2015 1:19 PM
To: Benzie, Richard (DEQ); Bruneau, Michelle (DCH); Busch, Stephen (DEQ); Dawn Hallwood (dhallwood@gchd.us); Dykema, Linda D. (DCH); Henry, James; Houk, Emily (DCH); Lishinski, Karen (DCH); Peeler, Nancy (DCH); Shekter Smith, Liane (DEQ); Valacak, Mark; Wurfel, Brad (DEQ)
Cc: Groetsch, Kory J. (DCH)
Subject: Flint Pb Health Education Conference Call Summary

Hello All,

Below is a summary from our call. Please note the action items. In addition, Karen Lishinski pointed out this EPA website as a good resource: http://water.epa.gov/drink/contaminants/basicinformation/lead.cfm

SUMMARY:
A conference call with the attendees listed below occurred on 9/22/2015 discussing lead (Pb) outreach in the city of Flint. The purpose of the call was to facilitate introductions, and identify Pb health education materials, current Pb outreach efforts in Flint and existing resources. DEQ provided a brief background of the drinking water compliance process in relation to efforts being conducted in Flint. Information sharing occurred between attendees about the Pb in drinking water sampling efforts in Flint.

Each agency/department listed their current health education efforts and available resources that could be made available relative to Pb outreach in Flint. The CLPPP provides some limited funding to prosperity region 6 to conduct Pb outreach. CLPPP is building a Pb Tool Kit for providers. Information about Pb in drinking water does not currently exist in these materials, but they are interested to build that information into the tool kit. DEQ has contacts with the Flint's drinking water program. GCHD has been getting many phone calls and they have had to create factsheets about water hardness and trihalomethanes.

Action Items from the Call:

1. Participants will e-mail their Pb outreach materials and presentations that are in current use to Michelle Bruneau (BruneauM@michigan.gov).
2. GCHD will send Michelle a list of concerns they have been getting from the Flint community.
3. Michelle will to look over the materials to assess what messages are covered, what messages are not covered, and provide suggestions on what work may need to be done to address gaps.
4. Follow-up is needed on the water sampling directions being provided by the city to homeowners that request a Pb in tap water analysis. (There are two sampling procedures depending on the purpose of the water sample.)
5. Karen Lishinski will provide a contact at WIC, so they can be invited to our follow-up conference call.
6. MDHHS-DEH will arrange a follow-up conference call in approximately two weeks.

Attendees:
Dawn Hallwood (Genesse Co HD)
James Henry (GCHD)
Mark Valacak (GCHD)
Brad Wurfel (DEQ)
Liane Shekter-Smith (DEQ)
Richard Benzie (DEQ)
Stephen Busch (DEQ)

Nancy Peeler (DHHS)
Karen Lishinski (DHHS)
Linda Dykema (DHHS)
Kory Groetsch (DHHS)
Michelle Bruneau (DHHS)

Current plan is to schedule another conference call in two weeks. Clearly, this is a dynamic and evolving situation.

FYI- I am currently in St. Ignace participating in an emergency response exercise.

Best Regards,

Kory Groetsch, MS , Manager
Toxicology and Response Section
Michigan Dept of Health and Human Services (MDHHS)
201 Townsend St.
Lansing, MI 48913
517-335-9935
groetschk@michigan.gov

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Rennaker, Joanne (DEQ)

From:	Benzie, Richard (DEQ)
Sent:	Wednesday, September 09, 2015 3:22 PM
To:	Poy, Thomas (poy.thomas@epa.gov)
Cc:	Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject:	Flint Pb&Cu Results
Attachments:	ACLU FOIA - Lab Results for Flint.pdf

Tom,

Here are the scanned analytical results from the latest round of compliance monitoring (January 1 – June 30, 2015) conducted in Flint. They were scanned for the purpose of responding to a Freedom of Information Act request.

I believe you already have a copy of the correspondence from our Lansing District Office notifying the city of Flint of the compliance determination that was based on these results.

If you need more information, contact Adam Rosenthal.

Richard

Richard Benzie, P.E., Chief
Field Operations Section
Office of Drinking Water and Municipal Assistance, MDEQ
517-284-6512

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: (617) 335-8562

Sample Number
LF68790

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3811 BRENTWOOD DR,FLINT	Source:	Single Family Dwelling
Collected By:	REID SANDERS	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/14/2015 09:35
Sample Point:	KITCHEN	Date Received:	06/19/2015 11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (617) 335-8184
FAX: (517) 335-8562

Sample Number
LF63410

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	631 ALVORD AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JANICE BERRYMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/06/2015	07:00
Sample Point:	MAIN BATHROOM	Date Received:	05/13/2015	11:26
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 #
Copper	Not detected	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF68793

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1150 WOODSIDE DR,FLINT	Source:	Single Family Dwelling
Collected By:	DEBORAH CONRAD	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/14/2015 07:30
Sample Point:	KITCHEN	Date Received:	06/19/2015 11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.029	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF63411

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT		WSSN/Pool ID:	2310	
Collection Address:	216 BROWNING AVE,FLINT		Source:	Single Family Dwelling	
Collected By:	DEB		Site Code:		
Township/Well#/Section:	//		Collector:	Private Citizen	
County:	Genesee		Date Collected:	05/07/2015	08:00
Sample Point:	KITCHEN		Date Received:	05/13/2015	11:26
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 #
Copper	0.31	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.022	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF68023

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1807 OREN AVE,FLINT	Source:	Single Family Dwelling
Collected By:	MARK RUSSEL	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/08/2015 07:30
Sample Point:	BATHROOM	Date Received:	06/16/2015 11:11
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 #
Copper	Not detected	06/17/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.021	06/17/2015	0.001	0.015	EPA 200.8	7439-92-1

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
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 Plopor
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
LF68794

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	547 COPEMAN BLVD,FLINT	Source:	Single Family Dwelling	
Collected By:	LINDA LEE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:00
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.018	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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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
LF57728

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1224 DECKER ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LOU ANNE MALIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.10	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.013	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

Sample Number
LF70230

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1205 BLANCHARD AVE,FLINT	Source:	Single Family Dwelling
Collected By:	JOEL ARNOLD	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/24/2015 06:30
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
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 #
Copper	0.05	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.011	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF70222

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	721 EAST ST APT #2,FLINT	Source:	Single Family Dwelling
Collected By:	MELANIE POISSON	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/25/2015 06:30
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
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 #
Copper	0.16	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF54946

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1809 STEVENSON ST,FLINT	Source:	TYPE I	
Collected By:	MIKE TAYLOR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/10/2015	06:30
Sample Point:	KITCHEN SINK	Date Received:	02/19/2015	11:13
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 #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56223

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	4202 CUSTER AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JACQUELINE PEMBERTON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/04/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	0.27	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
810 257-3803

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
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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56225

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	401 E NEWALL ST,FLINT	Source:	Single Family Dwelling	
Collected By:	MARK CROMWELL SR	Site Code:		
Township/Well#/Section:	//	Collector:	Other	
County:	Genesee	Date Collected:	03/02/2015	09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56227

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2615 TRUMBULL AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JENNIFER PEDERSON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/27/2015	10:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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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: Julie 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
LF54663

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2205 FLUSHING RD,FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/15/2015 06:00
Sample Point:	KITCHEN	Date Received:	02/17/2015 10:47
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 #
Copper	0.13	02/18/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	02/18/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

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

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

005798

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
LF57730

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1220 DECKER ST,FLINT	Source:	Single Family Dwelling	
Collected By:	CARMEN PULIDO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57731

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1379 WASHINGTON,FLINT	Source:	Single Family Dwelling	
Collected By:	ROXANNE PUTMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:30
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57733

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1372 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO JR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.14	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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 48502-1640
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
LF57734

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1383 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling
Collected By:	ANTHONY PALLADENO III	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/19/2015 08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
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 #
Copper	0.17	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie Pieper
Systems Mgmt. Unit Mgr: George Krisztian

005802

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
LF57735

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1367 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEAH PALLADENO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	MAIN BATHROOM	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57736

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1701 MARQUETTE DR,FLINT	Source:	Single Family Dwelling	
Collected By:	CHARMA DOMPREH	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/14/2015	09:40
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.19	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminent 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
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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
LF58413

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	778 E BUNDY AVE,FLINT	Source:	TYPE I	
Collected By:	SANDRA HULL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:25
Sample Point:	MAIN BATHROOM	Date Received:	03/31/2015	11:11
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 #
Copper	Not detected	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
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

005805

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
LF58414

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3714 BEECHER RD,FLINT	Source:	TYPE I	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:30
Sample Point:	KITCHEN	Date Received:	03/31/2015	11:11
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 #
Copper	0.52	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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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
LF59749

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1016 INGLESIDE AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JAMES D JARVIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/09/2015	07:00
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.07	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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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) 335-8662

Sample Number
LF59750

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1818 ROCK CREEK LN,FLINT	Source:	Single Family Dwelling	
Collected By:	HELEN HUNTER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/06/2015	08:50
Sample Point:	MAIN BATHROOM	Date Received:	04/14/2015	11:07
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 #
Copper	0.11	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

Sample Number
LF59751

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3010 CHEYENNE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	GERTRUDE MARSHALL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/03/2015	08:50
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.10	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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Flint, MI 48502-1540
810 257-3603

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MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

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

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

005809

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
LF60546

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2606 MOUNTAIN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	MARIBETH PEREZ	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/15/2015	12:00
Sample Point:	KITCHEN	Date Received:	04/21/2015	10:41
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 #
Copper	Not detected	04/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005810

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
LF61845

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2020 CROOKED LN,FLINT	Source:	Single Family Dwelling	
Collected By:	TRACY & M IKE SARGENT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/24/2015	07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015	10:21
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 #
Copper	0.10	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF61846

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	310 E MOORE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	HUSTON BOLDEN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/22/2015	07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015	10:21
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 #
Copper	Not detected	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

005812

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
LF64283

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3714 BEECHER RD,FLINT	Source:	Single Family Dwelling	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/14/2015	06:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	0.15	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

005813

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
LF64285

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	912 LEXINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA HATT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/15/2015	09:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	Not detected	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

005814

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
LF67423

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	344 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	CASSANDRA BROWN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:15
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

005815

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
LF67424

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	357 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	FRANK EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.20	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

005816

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
LF67425

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	328 ROBBIE LN,FLINT	Source:	Single Family Dwelling
Collected By:	WILLIE TURNER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/30/2015 06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015 10:51
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 #
Copper	0.09	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF67427

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	353 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	ZETAN EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/30/2015	06:45
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie 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
LF67428

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	349 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	DORIS NUNN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	Not detected	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF68792

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	853 E 7TH ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA STUDACHER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/12/2015	06:30
Sample Point:	BATHROOM	Date Received:	06/19/2015	11:02
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 #
Copper	0.07	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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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

005820

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
LF68791

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1615 S FRANKLIN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	VIVAN GRIER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:45
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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Flint, MI 48502-1540
810 257-3603

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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
LF68788

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	421 LYON ST,FLINT	Source:	Single Family Dwelling	
Collected By:	SAMUEL J CONDE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	08:34
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	0.14	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005822

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
LF68789

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1528 DELAWARE AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	CAROL PARKER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/12/2015	05:23
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

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

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

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
LF69622

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	920 STOCKER AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	MICHAEL TAYLOR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/21/2015	10:30
Sample Point:	KITCHEN	Date Received:	06/25/2015	11:52
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 #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

005824

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
LF69623

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	742 LINCOLN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	DANA STIF	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/19/2015	07:00
Sample Point:	KITCHEN	Date Received:	06/25/2015	11:52
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 #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3803

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 Ploper
Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF69624

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3517 BENNETT AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	RANDOLPH FREEMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/24/2015	05:05
Sample Point:	KITCHEN	Date Received:	06/25/2015	11:52
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 #
Copper	0.06	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

005826

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

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

Sample Number
LF69625

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1730 OVERHILL DR,FLINT	Source:	Single Family Dwelling	
Collected By:	PETER M BADE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/22/2015	05:30
Sample Point:	KITCHEN	Date Received:	06/25/2015	11:52
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 #
Copper	0.08	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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
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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF69626

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2117 STANFORD AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	CHIMENE HILL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/23/2015	08:20
Sample Point:	MAIN BATHROOM	Date Received:	06/25/2015	11:52
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 #
Copper	0.08	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

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

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

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
LF69627

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2432 BETA LN,FLINT	Source:	Single Family Dwelling
Collected By:	JON KINGEN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/21/2015 07:00
Sample Point:	KITCHEN	Date Received:	06/25/2015 11:52
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 #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie Pieper
Systems Mgmt. Unit Mgr: George Krisztian

005829

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

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

Sample Number
LF69628

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2023 MILLER RD,FLINT	Source:	Single Family Dwelling	
Collected By:	CAROL A HIGGINS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/21/2015	11:00
Sample Point:	KITCHEN	Date Received:	06/25/2015	11:52
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 #
Copper	0.06	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF70223

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3814 WHITTIER,FLINT	Source:	Single Family Dwelling	
Collected By:	BRIAN URCH	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/25/2015	07:33
Sample Point:	BATHROOM	Date Received:	06/30/2015	11:14
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 #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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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
LF70224

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3120 NORWOOD DR,FLINT	Source:	Single Family Dwelling	
Collected By:	TOM HUTCHINGS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/24/2015	06:20
Sample Point:	BATHROOM	Date Received:	06/30/2015	11:14
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring	

TEST INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

005832

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
LF70225

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2122 PIERCE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	KATHLEEN REID	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/21/2015	07:00
Sample Point:	KITCHEN	Date Received:	06/30/2015	11:14
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 #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

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

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

005833

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
LF70226

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3521 BENNETT AVE,FLINT	Source:	Single Family Dwelling
Collected By:	BRENT WRIGHT	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/25/2015 06:35
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
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 #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

005834

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
LF70227

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1602 RASPBERRY LN,FLINT	Source:	Single Family Dwelling	
Collected By:	BRAD FARRAR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/24/2015	07:15
Sample Point:	KITCHEN	Date Received:	06/30/2015	11:14
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 #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

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
LF70228

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1809 LYNBROOK,FLINT	Source:	Single Family Dwelling	
Collected By:	DAWN STEELE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/26/2015	04:35
Sample Point:	KITCHEN	Date Received:	06/30/2015	11:14
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 #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005836

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
LF70229

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2112 SHERFF,FLINT	Source:	Single Family Dwelling	
Collected By:	KAREN EATON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/24/2015	09:30
Sample Point:	KITCHEN	Date Received:	06/30/2015	11:14
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 #
Copper	0.06	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.009	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie 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
LF70231

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	860 SCHAFER ST,FLINT	Source:	Single Family Dwelling
Collected By:	DERRICK JONES	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/26/2015 05:27
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
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 #
Copper	0.06	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005838

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
LF71158

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2110 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	SHELLY SANETRIK	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/30/2015	08:34
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	0.10	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
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

005839

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
LF71159

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2300 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	CONSTANCE VAUGHN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/29/2015	09:30
Sample Point:	BATHROOM	Date Received:	07/07/2015	11:34
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 #
Copper	0.28	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005840

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
LF71160

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2130 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	ROSARIO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/26/2015	17:46
Sample Point:	BASEMENT	Date Received:	07/07/2015	11:34
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 #
Copper	0.05	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
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: Julie 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
LF71162

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2202 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	BARBARA NELSON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/29/2015	06:30
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	0.08	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3803

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

005842

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
LF71163

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2429 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	ROLAND WATSON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/30/2015	08:00
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	0.06	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF71165

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	4013 BROWNELL BLVD,FLINT	Source:	Single Family Dwelling	
Collected By:	ADRIAN AND PHYLLIS JONES	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/29/2015	08:30
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	0.08	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005844

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
LF71166

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2414 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	MICHELLE AND MICHAEL REED	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/30/2015	07:30
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
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
LF71167

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	1914 PENBROOK LN,FLINT	Source:	Single Family Dwelling	
Collected By:	KARL ADKINS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/29/2015	06:00
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005846

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
LF71168

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3901 LEERDA ST,FLINT	Source:	Single Family Dwelling
Collected By:	CARNETTA CARTER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/26/2015 08:25
Sample Point:	KITCHEN	Date Received:	07/07/2015 11:34
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 #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF71169

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	3142 MCCLURE,FLINT	Source:	Single Family Dwelling	
Collected By:	BOB FARRAR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/26/2015	06:20
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julie 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
LF71170

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	2114 FLUSHING RD,FLINT	Source:	Single Family Dwelling	
Collected By:	DAVID PAVLOVICH	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/29/2015	08:00
Sample Point:	KITCHEN	Date Received:	07/07/2015	11:34
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 #
Copper	0.05	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

005849

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
LF72033

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310	
Collection Address:	709 FROST ST,FLINT	Source:	Single Family Dwelling	
Collected By:	MAURCICA GUYNN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/30/2015	08:15
Sample Point:	BATHROOM	Date Received:	07/10/2015	10:36
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 #
Copper	Not detected	07/13/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/13/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
341 ROBBIE LN
FLINT MI 48505

Sample Number: LLF67426

Sample/Collection Information:

WSSN:
County: Genesee
Township:
Section:
Well #:
Collection Date: 5/31/2015 6:00:00 AM
Arrival Date: 6/11/2015 10:51:10 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: FLORISSA STEBBINS

CasNo	Analyte	Result	Detect	Units	Method
7440-50-8	COPPER (RECOVERABLE)	0.05	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	0.003	0.001	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:23:55 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
215 BROWNING AVE
FLINT MI 48507

Sample Number: LLF56226

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 3/2/2015 6:30:00 AM
Arrival Date: 3/6/2015 11:33:07 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: KEVIN & JENNIFER STARNES

CasNo	Analyte	Result	Detect	Units	Method
7440-50-8	COPPER (RECOVERABLE)	0.16	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:17:25 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
201 BROWNING AVE
FLINT MI 48507

Sample Number: LLF56228

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 3/5/2015 9:30:00 AM
Arrival Date: 3/6/2015 11:33:08 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: FLOYD BELL

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

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:17:49 EDT 2015

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, February 27, 2015 9:41 AM
To: Busch, Stephen (DEQ)
Subject: Flint PbCu 90th 2014

Pb 90th = 6.0 ppb with 2 samples <AL (23 & 37 ppb)
Cu 90th = 110 ppb with 0 samples <AL

Leanne Walters @ 212 Browning Ave with an individual sample of 104 ppb for lead did not participate in this 1st 6 month round of monitoring.

Adam

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 10, 2015 11:47 AM
To: Busch, Stephen (DEQ)
Subject: Flint pH
Attachments: Flint pH 2014-2015.doc

Steve,

Attached is a summary of WTP Ptap and Dist. pH values for Flint for the months of April, May, and June. I have not received the July MOR or the 2015 2nd Qtr WQP report from the city....

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

City of Flint
Water System pH

WTP Plant Tap

April 2015 :	**Avg: 7.83**	**Range: 7.54 - 8.02**
May 2015:	**Avg: 7.60**	**Range: 7.35 - 7.88**
June 2015:	**Avg: 7.61**	**Range: 7.40 - 7.76**

WQ Parameter Sites:

25 locations: Routine bacteriological monitoring sites (8 locations) and the Westside and Cedar Street reservoirs. 15 additional sites throughout the city following expansion of the pb/cu monitoring program.

2014 - 3rd Qtr:	**Avg: 7.71**	**Range: 7.56 – 7.86**
2014 - 4th Qtr:	**Avg: 7.88**	**Range: 7.62 – 8.10**
2015 - 1st Qtr	**Avg: 7.81**	**Range: 7.60 – 7.99**

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, October 01, 2015 5:19 PM
To: Busch, Stephen (DEQ)
Subject: Flint Plant Tap Pb
Attachments: 7Laboratory Sample Report.htm; 6Laboratory Sample Report.htm; 5Laboratory Sample Report.htm; 4Laboratory Sample Report.htm; 3Laboratory Sample Report.htm; 2Laboratory Sample Report.htm; 1Laboratory Sample Report.htm

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF44687

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Routine Monitoring
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT TAP
Collection Date:	10/28/2014 8:04:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	10/29/2014 11:15:14 AM	Collected By:	MIKE GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.62	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	143	20	mg/L	SM 2340 C
7440-23-5	SODIUM	18	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.02	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
57-12-5	CYANIDE	ND	0.02	mg/L	OIA-1677
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	60	4	mg/L	SM 4500-Cl E
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8

93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4
93-72-1	2,4,5-TP (SILVEX)	ND	0.0003	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.002	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0003	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00006	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	ND	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2
72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2

50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2
60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
11097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2
108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2

74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
75-25-2	BROMOFORM	0.0014	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0080	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.012	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.012	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2

75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2
91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
98-95-3	NITROBENZENE	ND	0.01	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.033	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0004	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	0.0005	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	0.0005	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	ND	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	ND	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	22	10	mg/L	SM 4500 SO4E
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:
A trip blank was not available for analysis with this sample.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1 17:16:11 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT -WATER PLANT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF19430

Sample/Collection Information:

WSSN:	02310	Site Code:	LAB TAP
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Routine Monitoring
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT LAB
Collection Date:	5/22/2014 8:30:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	5/22/2014 1:19:53 PM	Collected By:	MICHAEL GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.16	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	209	20	mg/L	SM 2340 C
7440-23-5	SODIUM	15	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.03	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
57-12-5	CYANIDE	ND	0.02	mg/L	OIA-1677
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	79	4	mg/L	SM 4500-Cl E
7440-47-					

3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8
93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4
93-72-1	2,4,5-TP (SILVEX)	ND	0.0003	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.002	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0003	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00006	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	ND	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2

72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2
50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2
60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
11097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2

108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2
74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
75-25-2	BROMOFORM	0.0010	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.013	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.022	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.020	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-					

4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2
75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2
91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
98-95-3	NITROBENZENE	ND	0.01	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.056	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0004	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	ND	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	ND	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	0.4	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	ND	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	25	10	mg/L	SM 4500 SO4E
7440-28-					

0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1 17:15:56 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
CITY OF FLINT WATER PLANT
FLINT MI 48505

Sample Number: LLF31222

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Other
Township:		Sample Reason:	Other
Section:		Sample Point:	Other
Well #:		Point Description:	PLANT TAP
Collection Date:	8/6/2014 2:30:00 PM	Collector:	Public Water Supply Operator
Arrival Date:	8/6/2014 4:23:13 PM	Collected By:	MIKE GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.70	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	155	20	mg/L	SM 2340 C
7440-23-5	SODIUM	16	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.03	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	61	4	mg/L	SM 4500-Cl E
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8
93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4

93-72-1	2,4,5-TP (SILVEX)	ND	0.0003	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.002	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0003	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00006	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	0.0003	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2
72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2
50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2

60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
11097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2
108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2
74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2

75-25-2	BROMOFORM	0.0018	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.015	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.045	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.024	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2
75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2

91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
98-95-3	NITROBENZENE	ND	0.01	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.086	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0004	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	ND	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	ND	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	0.5	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	0.001	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	23	10	mg/L	SM 4500 SO4E
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1
17:15:37 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF52712

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Other
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT TAP
Collection Date:	1/22/2015 10:00:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	1/23/2015 8:37:00 AM	Collected By:	MIKE GLASGOW

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

005876

0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1 17:14:07 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF54660

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Routine Monitoring
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT TAP
Collection Date:	2/16/2015 9:40:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	2/17/2015 10:46:51 AM	Collected By:	MIKE GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.57	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	180	20	mg/L	SM 2340 C
7440-23-5	SODIUM	25	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	ND	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
57-12-5	CYANIDE	ND	0.02	mg/L	OIA-1677
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	99	4	mg/L	SM 4500-Cl E
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8

93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4
93-72-1	2,4,5-TP (SILVEX)	ND	0.0002	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.001	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0002	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00004	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	ND	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2
72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2

50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2
60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
11097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2
108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2

74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
75-25-2	BROMOFORM	0.0007	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0025	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.0018	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0030	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2

75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2
91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.008	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0005	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	ND	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	ND	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	1.3	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	0.001	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	40	10	mg/L	SM 4500 SO4E
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

Endrin Aldehyde quality control results were outside allowed limits due to matrix interferences.
Unidentified hydrocarbon peak(s) were detected.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1 17:13:39 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF63412

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Routine Monitoring
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT TAP
Collection Date:	5/12/2015 11:33:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	5/13/2015 11:26:43 AM	Collected By:	MIKE GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.87	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	163	20	mg/L	SM 2340 C
7440-23-5	SODIUM	18	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.03	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
57-12-5	CYANIDE	ND	0.02	mg/L	OIA-1677
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	90	4	mg/L	SM 4500-Cl E
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8

93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4
93-72-1	2,4,5-TP (SILVEX)	ND	0.0002	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.001	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0002	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00004	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	ND	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2
72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2

50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2
60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
I1097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2
108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2

74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
75-25-2	BROMOFORM	0.0013	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0077	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.0072	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0099	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2

75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2
91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.026	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0005	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	ND	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	ND	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	ND	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	ND	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	31	10	mg/L	SM 4500 SO4E
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1
17:13:08 EDT 2015

Michigan Department of Environmental Quality

Replicate Laboratory Report for
Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
4500 N DORT HWY
FLINT MI 48505

Sample Number: LLF77582

Sample/Collection Information:

WSSN:	02310	Site Code:	
County:	Genesee	Water Source:	Public Community Water Supply
Township:		Sample Reason:	Routine Monitoring
Section:		Sample Point:	Treated Public Distribution System
Well #:		Point Description:	PLANT TAP
Collection Date:	8/11/2015 10:00:00 AM	Collector:	Public Water Supply Operator
Arrival Date:	8/12/2015 1:21:17 PM	Collected By:	C BEATENHEAD

CasNo	Analyte	Result	Detect	Units	Method
16984-48-8	FLUORIDE (AUTOMATED)	0.83	0.1	mg/L	SM 4500 FC
7439-89-6	IRON	ND	0.1	mg/L	SM 3500 FeB
HARD-00-C	HARDNESS AS CaCO3	110	20	mg/L	SM 2340 C
7440-23-5	SODIUM	18	5	mg/L	SM 3500 NaB
7440-38-2	ARSENIC (TOTAL)	ND	0.002	mg/L	EPA 200.8
7440-39-3	BARIUM	0.02	0.01	mg/L	EPA 200.8
7440-41-7	BERYLLIUM	ND	0.0004	mg/L	EPA 200.8
57-12-5	CYANIDE	ND	0.02	mg/L	OIA-1677
7440-43-9	CADMIUM (TOTAL)	ND	0.0003	mg/L	EPA 200.8
7647-14-5	CHLORIDE (AUTOMATED)	79	4	mg/L	SM 4500-Cl E
7440-47-3	CHROMIUM (TOTAL)	ND	0.01	mg/L	EPA 200.8

93-76-5	2,4,5-T	ND	0.002	mg/L	EPA 515.4
93-72-1	2,4,5-TP (SILVEX)	ND	0.0002	mg/L	EPA 515.4
94-75-7	2,4-D	ND	0.001	mg/L	EPA 515.4
50594-66-6	ACIFLUORFEN	ND	0.004	mg/L	EPA 515.4
25057-89-0	BENTAZON	ND	0.002	mg/L	EPA 515.4
1918-00-9	DICAMBA	ND	0.002	mg/L	EPA 515.4
88-85-7	DINOSEB	ND	0.0002	mg/L	EPA 515.4
87-86-5	PENTACHLOROPHENOL	ND	0.00004	mg/L	EPA 515.4
1918-02-1	PICLORAM	ND	0.001	mg/L	EPA 515.4
1861-32-1	TOTAL DCPA, MONO & DI-ACID DEGRADATES	ND	0.001	mg/L	EPA 515.4
116-06-3	ALDICARB	ND	0.0005	mg/L	EPA 531.2
1646-88-4	ALDICARB SULFONE	ND	0.0005	mg/L	EPA 531.2
1646-87-3	ALDICARB SULFOXIDE	ND	0.0005	mg/L	EPA 531.2
63-25-2	CARBARYL	ND	0.001	mg/L	EPA 531.2
1563-66-2	CARBOFURAN	ND	0.0005	mg/L	EPA 531.2
16655-82-6	HYDROXYCARBOFURAN,3-	ND	0.001	mg/L	EPA 531.2
2032-65-7	METHIOCARB	ND	0.001	mg/L	EPA 531.2
16752-77-5	METHOMYL	ND	0.001	mg/L	EPA 531.2
23135-22-0	OXAMYL	ND	0.001	mg/L	EPA 531.2
114-26-1	PROPOXUR (BAYGON)	ND	0.001	mg/L	EPA 531.2
34256-82-1	ACETOCHLOR	ND	0.001	mg/L	EPA 525.2
15972-60-8	ALACHLOR	ND	0.0002	mg/L	EPA 525.2
309-00-2	ALDRIN	ND	0.0004	mg/L	EPA 525.2
1912-24-9	ATRAZINE	ND	0.0002	mg/L	EPA 525.2
5103-71-9	CHLORDANE, ALPHA-	ND	0.0002	mg/L	EPA 525.2
5103-74-2	CHLORDANE, GAMMA-	ND	0.0002	mg/L	EPA 525.2
72-54-8	DDD,4,4'-	ND	0.001	mg/L	EPA 525.2
72-55-9	DDE,4,4'-	ND	0.001	mg/L	EPA 525.2

50-29-3	DDT,4,4'-	ND	0.0005	mg/L	EPA 525.2
60-57-1	DIELDRIN	ND	0.0005	mg/L	EPA 525.2
72-20-8	ENDRIN	ND	0.0001	mg/L	EPA 525.2
7421-93-4	ENDRIN ALDEHYDE	ND	0.001	mg/L	EPA 525.2
76-44-8	HEPTACHLOR	ND	0.0002	mg/L	EPA 525.2
1024-57-3	HEPTACHLOR EPOXIDE	ND	0.0001	mg/L	EPA 525.2
118-74-1	HEXACHLOROBENZENE	ND	0.0001	mg/L	EPA 525.2
319-84-6	HEXACHLOROCYCLOHEXANE (ALPHA-BHC)	ND	0.001	mg/L	EPA 525.2
319-85-7	HEXACHLOROCYCLOHEXANE (BETA-BHC)	ND	0.001	mg/L	EPA 525.2
319-86-8	HEXACHLOROCYCLOHEXANE (DELTA-BHC)	ND	0.001	mg/L	EPA 525.2
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	0.0005	mg/L	EPA 525.2
58-89-9	LINDANE (GAMMA-BHC)	ND	0.0001	mg/L	EPA 525.2
72-43-5	METHOXYCHLOR	ND	0.0001	mg/L	EPA 525.2
51218-45-2	METOLACHLOR	ND	0.001	mg/L	EPA 525.2
21087-64-9	METRIBUZIN	ND	0.001	mg/L	EPA 525.2
2212-67-1	MOLINATE	ND	0.0005	mg/L	EPA 525.2
12674-11-2	PCB (AROCLOR 1016)	ND	0.0001	mg/L	EPA 525.2
11104-28-2	PCB (AROCLOR 1221)	ND	0.0001	mg/L	EPA 525.2
11141-16-5	PCB (AROCLOR 1232)	ND	0.0001	mg/L	EPA 525.2
53469-21-9	PCB (AROCLOR 1242)	ND	0.0001	mg/L	EPA 525.2
12672-29-6	PCB (AROCLOR 1248)	ND	0.0001	mg/L	EPA 525.2
11097-69-1	PCB (AROCLOR 1254)	ND	0.0001	mg/L	EPA 525.2
11096-82-5	PCB (AROCLOR 1260)	ND	0.0001	mg/L	EPA 525.2
59536-65-1	POLYBROMINATED BIPHENYLS	ND	0.0001	mg/L	EPA 525.2
122-34-9	SIMAZINE	ND	0.0002	mg/L	EPA 525.2
8001-35-2	TOXAPHENE	ND	0.001	mg/L	EPA 525.2
71-43-2	BENZENE	ND	0.0005	mg/L	EPA 524.2
108-86-1	BROMOBENZENE	ND	0.0005	mg/L	EPA 524.2

74-97-5	BROMOCHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
75-25-2	BROMOFORM	0.0013	0.0005	mg/L	EPA 524.2
74-83-9	BROMOMETHANE	ND	0.001	mg/L	EPA 524.2
104-51-8	BUTYLBENZENE,NORMAL-	ND	0.0005	mg/L	EPA 524.2
135-98-8	BUTYLBENZENE,SEC-	ND	0.0005	mg/L	EPA 524.2
98-06-6	BUTYLBENZENE,TERT-	ND	0.0005	mg/L	EPA 524.2
56-23-5	CARBON TETRACHLORIDE	ND	0.0005	mg/L	EPA 524.2
108-90-7	CHLOROBENZENE	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0052	0.0005	mg/L	EPA 524.2
75-00-3	CHLOROETHANE	ND	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.0015	0.0005	mg/L	EPA 524.2
74-87-3	CHLOROMETHANE	ND	0.0005	mg/L	EPA 524.2
95-49-8	CHLOROTOLUENE,2-	ND	0.0005	mg/L	EPA 524.2
106-43-4	CHLOROTOLUENE,4-	ND	0.0005	mg/L	EPA 524.2
74-95-3	DIBROMOMETHANE	ND	0.0005	mg/L	EPA 524.2
95-50-1	DICHLOROBENZENE,1,2-	ND	0.0005	mg/L	EPA 524.2
541-73-1	DICHLOROBENZENE,1,3-	ND	0.0005	mg/L	EPA 524.2
106-46-7	DICHLOROBENZENE,1,4-	ND	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0036	0.0005	mg/L	EPA 524.2
75-71-8	DICHLORODIFLUOROMETHANE	ND	0.001	mg/L	EPA 524.2
75-34-3	DICHLOROETHANE,1,1-	ND	0.0005	mg/L	EPA 524.2
107-06-2	DICHLOROETHANE,1,2-	ND	0.0005	mg/L	EPA 524.2
75-35-4	DICHLOROETHYLENE,1,1-	ND	0.0005	mg/L	EPA 524.2
156-59-2	DICHLOROETHYLENE,1,2-CIS	ND	0.0005	mg/L	EPA 524.2
156-60-5	DICHLOROETHYLENE,1,2-TRANS	ND	0.0005	mg/L	EPA 524.2
78-87-5	DICHLOROPROPANE,1,2-	ND	0.0005	mg/L	EPA 524.2
142-28-9	DICHLOROPROPANE,1,3-	ND	0.0005	mg/L	EPA 524.2
594-20-7	DICHLOROPROPANE,2,2-	ND	0.0005	mg/L	EPA 524.2
563-58-6	DICHLOROPROPENE,1,1-	ND	0.0005	mg/L	EPA 524.2
10061-01-5	DICHLOROPROPENE,1,3-CIS	ND	0.0005	mg/L	EPA 524.2
10061-02-6	DICHLOROPROPENE,1,3-TRANS	ND	0.0005	mg/L	EPA 524.2
100-41-4	ETHYLBENZENE	ND	0.0005	mg/L	EPA 524.2
75-69-4	FLUOROTRICHLOROMETHANE	ND	0.001	mg/L	EPA 524.2
87-68-3	HEXACHLOROBUTADIENE	ND	0.0005	mg/L	EPA 524.2
98-82-8	ISOPROPYL BENZENE	ND	0.0005	mg/L	EPA 524.2
99-87-6	ISOPROPYL TOLUENE, PARA-	ND	0.0005	mg/L	EPA 524.2
78-93-3	METHYL ETHYL KETONE	ND	0.005	mg/L	EPA 524.2
108-10-1	METHYL ISOBUTYL KETONE	ND	0.005	mg/L	EPA 524.2
1634-04-4	METHYL TERT-BUTYL ETHER	ND	0.001	mg/L	EPA 524.2

75-09-2	METHYLENE CHLORIDE	ND	0.0006	mg/L	EPA 524.2
91-20-3	NAPHTHALENE	ND	0.0005	mg/L	EPA 524.2
103-65-1	PROPYLBENZENE, NORMAL-	ND	0.0005	mg/L	EPA 524.2
100-42-5	STYRENE	ND	0.0005	mg/L	EPA 524.2
630-20-6	TETRACHLOROETHANE,1,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-34-5	TETRACHLOROETHANE,1,1,2,2-	ND	0.0005	mg/L	EPA 524.2
127-18-4	TETRACHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
109-99-9	TETRAHYDROFURAN	ND	0.005	mg/L	EPA 524.2
108-88-3	TOLUENE	ND	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.012	NA	mg/L	EPA 524.2
87-61-6	TRICHLOROBENZENE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
120-82-1	TRICHLOROBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
71-55-6	TRICHLOROETHANE,1,1,1-	ND	0.0005	mg/L	EPA 524.2
79-00-5	TRICHLOROETHANE,1,1,2-	ND	0.0005	mg/L	EPA 524.2
79-01-6	TRICHLOROETHYLENE	ND	0.0005	mg/L	EPA 524.2
96-18-4	TRICHLOROPROPANE,1,2,3-	ND	0.0005	mg/L	EPA 524.2
95-63-6	TRIMETHYLBENZENE,1,2,4-	ND	0.0005	mg/L	EPA 524.2
108-67-8	TRIMETHYLBENZENE,1,3,5-	ND	0.0005	mg/L	EPA 524.2
75-01-4	VINYL CHLORIDE	ND	0.0005	mg/L	EPA 524.2
XYLMP-00-C	XYLENE,META-&PARA-	ND	0.0005	mg/L	EPA 524.2
95-47-6	XYLENE,ORTHO-	ND	0.0005	mg/L	EPA 524.2
1330-20-7	XYLENES (TOTAL)	ND	NA	mg/L	EPA 524.2
7439-97-6	MERCURY	ND	0.0001	mg/L	EPA 200.8
7440-02-0	NICKEL	ND	0.01	mg/L	EPA 200.8
14797-65-0	NITRITE AS N (AUTOMATED)	ND	0.05	mg/L	10-107-04-2-B
14797-55-8	NITRATE AS N (AUTOMATED)	ND	0.4	mg/L	10-107-04-2-B
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8
7440-36-0	ANTIMONY	ND	0.0006	mg/L	EPA 200.8
7782-49-2	SELENIUM (TOTAL)	ND	0.001	mg/L	EPA 200.8
14808-79-8	SULFATE (AUTOMATED)	21	10	mg/L	SM 4500 SO4E
7440-28-0	THALLIUM	ND	0.0002	mg/L	EPA 200.8

Laboratory Comments:
Matrix spike recovery was below the acceptance criteria due to the presence of residual chlorine in the sample. This does not affect the validity of the sample result.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1 17:12:44 EDT 2015

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Saturday, October 18, 2014 7:57 PM
To: Busch, Stephen (DEQ)
Subject: Flint repeat samples Site no. 4

Steve,

All repeat samples collected yesterday in response to the TC positive at Site #4 (taco bell) from Thurs were non detect.

Sent from my iPho

Rennaker, Joanne (DEQ)

From: Henry, James <jhenry@gchd.us>
Sent: Thursday, October 08, 2015 3:14 PM
To: Howard Croft
Cc: Busch, Stephen (DEQ); Hallwood, Dawn
Subject: Flint Restaurants and Retail Food Stores

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

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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: Rosenthal, Adam (DEQ)
Sent: Tuesday, April 01, 2014 11:46 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Flint revised MS letter
Attachments: 2014 Flint revised MS.doc

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

005900

April 1, 2014

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 – 2014
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for calendar year 2014 outlining the minimum requirements for your public water supply. 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 DEQ Laboratory, you can order bottles by calling 517-335-8184. Be certain of the EPA sampling and analysis method requirements for hold times.

Please note that both distribution and entry point to the distribution system monitoring will increase upon plant startup.

Monthly Operation Report Requirements:

In addition to plant operational data collected, the City of Flint will be required to collect Total Organic Compounds (TOC) samples from the source and finish water on a monthly basis. You will also be required to collect Water Quality Parameters (WQPs) at your entry point every 2 weeks. The City must also demonstrate adequate contact time (CT) for disinfection.

Sample Siting Plans:

Since the City of Flint will no longer be subject to the consecutive system approach, a revised Disinfection & Disinfectants By-Product (DDBP) plan must be submitted, which includes 4 additional sites for routine quarterly monitoring.

This also increases your distribution system monitoring for WQPs to 25 samples per 6 months and 100 locations for Lead & Copper for 2 consecutive 6 month rounds of monitoring. Please submit a list of these locations for approval choosing Tier 1 sites if available.

Record Keeping:

Not sure what you wanted to list here.

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 "2014 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us by telephone or email 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

MFP:AR:JR
Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Wednesday, May 27, 2015 1:58 PM
To: Cook, Pat (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Cc: Benzie, Richard (DEQ); Philip, Kris (DEQ); Deltoral, Miguel; Poy, Thomas
Subject: Flint sample results/2 houses for (dw) metals (Cu, Pb, Zn)
Attachments: 1505003_work order.pdf; 1505003,1505004 FINAL EXCEL 26 May 15 0943.xls; 1505003,1505004 FINAL May 26 15 0943.PDF; 1505004_work order.pdf

Importance: High

Pat, Steve, Mike: When Miguel was in Flint observing Ms Walters' service line being replaced, he also sampled 2 homes connected to the water main Ms. Walters' home was connected to. The Excel spreadsheet attached provides the sample results, 15 samples per house. The 5th column, Sample No., is from 1-15 which is Home 1, then the numbers start again at 1 and go through 15, which is Home 2. These are the 2 homes connected to the water main that Ms. Walters' 136 ft service line (iron pipe) was connected to. Her home also had the lead line connecting the shut-off to the main, as does Home 1. I know I talked with Pat about the sequential sampling in late April at Ms. Walters' home, prior to her service line being replaced, but I don't think I sent you those sample results—they were in the thousands of ppb, probably particulate lead. I will get with Miguel and communicate with you his ideas concerning the source of this lead in Ms. Walters' service line. See Miguel's email below regarding these 2 homes' sample results.
If you have questions, please let me or Miguel know.
Jennifer
312-886-0244
Miguel
312-886-5253

From: Deltoral, Miguel
Sent: Tuesday, May 26, 2015 11:42 AM
To: Poy, Thomas
Cc: Porter, Andrea; Marc Edwards; Schock, Michael
Subject: Fw: 1505003 & 1505004; ICP-MS (dw) metals (Cu, Pb, Zn); Flint MI

Here are the results from the two homes sampled in Flint. Nothing horrific which is good. One home does not appear to have a LSL at all (Home 2). The other home (Home 1) appears to have a short LSL, consistent with the practice in Flint (curb to main only). Highest result from the LSL home (Home 1) was 22 ug/L using the standard analytical protocol. They will now get shipped to Marc Edwards at Virginia Tech to see if our protocol is missing particulate lead, which made up the majority of the lead in Ms. Walters sample results.

I forgot to mention that all along the block where Ms. Walters lives, there are patches in the street from non-water-related utility excavation right up to the curb, so fairly recent physical disturbances to Ms. Walters service line are likely. I think it was gas work, but I have to check.

Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

From: Griffin, Sylvia
Sent: Tuesday, May 26, 2015 10:03 AM
To: Deltoral, Miguel
Cc: Wroble, Amanda
Subject: FW: 1505003 & 1505004; ICP-MS (dw) metals (Cu, Pb, Zn); Flint MI

Please see the attached final results reports. Should you have any questions regarding this transmittal, please email or call me.

Thank you.

-Sylvia
3-9073

From: Wroble, Amanda
Sent: Tuesday, May 26, 2015 9:58 AM
To: Griffin, Sylvia
Subject: 1505003 & 1505004; ICP-MS (dw) metals (Cu, Pb, Zn); Flint MI

Amanda Wroble, Ph.D.
Chemist and Sample Coordinator
USEPA Region 5 Chicago Regional Laboratory
536 S. Clark St. ML-10C
Chicago, IL 60605
(312) 353-0375

Environmental Protection Agency Region 5

Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

WORK ORDER

1505003

Printed: 5/18/2015 2:55:56PM

US EPA Region 5 Chicago Regional Laboratory

Client:	**Water Division, Drinking Water**	**Project Manager:**	**Greg Mitsakopoulos**
Project:	**Flint, Michigan**	**Project Number:**	**[none]**

Report To:

Miguel Del Toral	77 West Jackson Boulevard	Phone: (312) 886-5253
Water Division, Drinking Water	Chicago, IL 60604	Fax: (312) 886-2001

Date Due:	Jul-12-15 15:00 (60 day TAT)		
Received By:	Robert Snyder	Date Received:	May-11-15 10:12
Logged In By:	Robert Snyder	Date Logged In:	May-11-15 16:42

Samples Received at:	21.8°C
Sample tags/labels	Yes
Seals Intact	Yes
Received on ice	No
Paperwork Included	Yes

Analysis	Due	TAT	Expires	Comments
1505003-01 1 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-02 2 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-03 3 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-04 4 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-05 5 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	

WORK ORDER

Printed: 5/18/2015 2:55:56PM

1505003

US EPA Region 5 Chicago Regional Laboratory

Client:	**Water Division, Drinking Water**	**Project Manager:**	**Greg Mitsakopoulos**
Project:	**Flint, Michigan**	**Project Number:**	**[none]**

Analysis	Due	TAT	Expires	Comments
1505003-06 6 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-07 7 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-08 8 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-09 9 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-10 10 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-11 11 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-12 12 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-13 13 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
1505003-14 14 [Water] Sampled May-06-15 07:20 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:20	

WORK ORDER

Printed: 5/18/2015 2:55:56PM

1505003

US EPA Region 5 Chicago Regional Laboratory

Client:	**Water Division, Drinking Water**	**Project Manager:**	**Greg Mitsakopoulos**
Project:	**Flint, Michigan**	**Project Number:**	**[none]**

Analysis	Due	TAT	Expires	Comments
1505003-15 15 [Water] Sampled May-06-15 07:25 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-02-15 07:25	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-02-15 07:25	

Reviewed By

Date

SAMPDATA

CLIENT	PROJECT	PROJECT	LabName	SAMPLEN	LABSAMP	MATRIX	RPTMATR	SAMPDAT
Water Divi	Flint, Michi	[none]	US EPA R	1	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	1	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	1	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	2	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	2	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	2	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	3	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	3	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	3	1505003-0	Water	Water	05/06/2015
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Water Divi	Flint, Michi	[none]	US EPA R	5	1505003-0	Water	Water	05/06/2015
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Water Divi	Flint, Michi	[none]	US EPA R	5	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	6	1505003-0	Water	Water	05/06/2015
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Water Divi	Flint, Michi	[none]	US EPA R	8	1505003-0	Water	Water	05/06/2015
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Water Divi	Flint, Michi	[none]	US EPA R	8	1505003-0	Water	Water	05/06/2015
Water Divi	Flint, Michi	[none]	US EPA R	9	1505003-0	Water	Water	05/06/2015
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Water Divi	Flint, Michi	[none]	US EPA R	2	1505004-0	Water	Water	05/11/2015
Water Divi	Flint, Michi	[none]	US EPA R	2	1505004-0	Water	Water	05/11/2015
Water Divi	Flint, Michi	[none]	US EPA R	2	1505004-0	Water	Water	05/11/2015

SAMPDATA

Water Divis	Flint, Michi	[none]	US EPA Re	3	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	3	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	3	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	4	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	4	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	4	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	5	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	5	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	5	1505004-0	Water	Water	05/11/2015
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Water Divis	Flint, Michi	[none]	US EPA Re	7	1505004-0	Water	Water	05/11/2015
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Water Divis	Flint, Michi	[none]	US EPA Re	8	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	8	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	9	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	9	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	9	1505004-0	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	10	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	10	1505004-1	Water	Water	05/11/2015
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Water Divis	Flint, Michi	[none]	US EPA Re	13	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	13	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	14	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	14	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	14	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	15	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	15	1505004-1	Water	Water	05/11/2015
Water Divis	Flint, Michi	[none]	US EPA Re	15	1505004-1	Water	Water	05/11/2015

SAMPDATA

PREPDAT	ANADATE	BATCH	METHODC	METHODN	PREPNAM	ANALYTE	CASNUMB	SURROGA
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E026	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)		200.8/no di	Zinc	7440-66-6	FALSE

SAMPDATA

05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/18/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Lead	7439-92-1	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Copper	7440-50-8	FALSE
05/18/2015	05/19/2015	B15E027	Metals ICP-MS (DW)	200.8/no di	Zinc	7440-66-6	FALSE

SAMPDATA

TIC	Result	DL	RL	UNITS	RPToMDL	BASIS	DILUTION	SPIKELEV
FALSE	2.63	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	40.7	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	132	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	4.77	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	44.4	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	55.3	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	4.79	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	39.3	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	88.8	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	6.26	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	66.8	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	57.2	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.07	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	272	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	34.2	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.70	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	362	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	21.4	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	11.7	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	331	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	19.5	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	22.5	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	69.9	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	16.6	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	12.7	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	42.5	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	15.1	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.94	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	38.4	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	14.4	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.72	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	37.5	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	14.5	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.39	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	34.8	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	13.6	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.23	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	33.1	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	13.1	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.20	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	32.8	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	13.0	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	3.00	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	31.4	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	12.3	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	8.11	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	31.1	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	64.0	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	1.46	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	14.7	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	

FALSE	1.72	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	20.0	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.933	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	13.0	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.862	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	12.3	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.795	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	14.2	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.769	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	14.2	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.691	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	13.3	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.774	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	9.60	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.715	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.57	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.611	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.04	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.655	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.30	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.644	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.37	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.631	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.09	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	
FALSE	0.621	0.0140	0.500	ug/L	FALSE	NA	1	
FALSE	7.05	0.0220	1.00	ug/L	FALSE	NA	1	
FALSE	U	0.190	10.0	ug/L	FALSE	NA	1	

RECOVER	UPPERCL	LOWERCL	ANALYST	PSOLIDS	LNOTE	ANOTE	LATITUDE	LONGITUD
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sComment	SNOTE1	SNOTE2	SNOTE3	SNOTE4	SNOTE5	SNOTE6	SNOTE7	SNOTE8
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SNOTE9	SNOTE10	ANALYTEORDER	
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5 CHICAGO REGIONAL LABORATORY
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605

Date: 5/26/2015

Subject: Review of Region 5 Data for Flint, Michigan

To: Water Division, Drinking Water
77 West Jackson Boulevard
Chicago, IL 60604

From: Amanda Wroble, Chemist
US EPA Region 5 Chicago Regional Laboratory

The data transmitted under this cover memo successfully passed CRL's data review procedures as documented in the current Quality Management Plan and applicable Standard Operating Procedures. In accordance with EPA's *Guidance on Environmental Data Verification and Data Validation* (Document EPA QA/G-8), CRL verified and validated the data but does not perform data quality assessment based on project plans.

This report was reviewed and the information provided herein accurately represents the analysis performed.

X _____

Please contact the analyst with any technical report issues, Amanda Wroble at (312)-353-0375 for sample project concerns, and Sylvia Griffin at (312)-353-9073 with data transmittal questions. Thank you.

Attached are Results for: Flint, Michigan

_____ / /

Data Management Coordinator and DateTransmitted

Analyses included in this report:

Metals ICP-MS (DW)

Environmental Protection Agency Region 5
Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	Reported:
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

ANALYSIS CASE NARRATIVE

GENERAL INFORMATION

CRL received 30 drinking water samples for copper, lead, and zinc analysis by inductively coupled plasma-mass spectrometry (ICP-MS) on 11 May 2015 that were assigned to work orders 1505003 and 1505004. The designated analyst for these samples, Amanda Wroble, can be reached at 312.353.0375.

The samples were received unpreserved. Therefore, 2 mL of nitric acid was added to each 1 L sample. At least twenty-four hours elapsed before subsampling began. All holding times were met.

No digestion is required for drinking water samples. Samples were analyzed in batches B15E026 and B15E027 over three runs using CRL SOP METALS001 (EPA Method 200.8), Revision 3.

Work orders 1505003 and 1505004 were analyzed together. All supporting data are filed under work order 1505003.

SAMPLE ANALYSIS AND RESULTS

The data reported herein meet the data quality objectives referenced in personal email communication with the project manager dated May 12, 2015 and the quality assurance project plan "Impacts on Lead Concentration in Drinking Water Samples Due to Sample Location and Sample Collection Protocols" dated January 20, 2011 referenced therein.

QUALITY CONTROL

All quality control audits were within CRL limits for the requested analytes or did not result in qualification of the data.

Environmental Protection Agency Region 5
Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Environmental Protection Agency Region 5
Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1	1505003-01	Water	May-06-15 07:20	May-11-15 10:12
2	1505003-02	Water	May-06-15 07:20	May-11-15 10:12
3	1505003-03	Water	May-06-15 07:20	May-11-15 10:12
4	1505003-04	Water	May-06-15 07:20	May-11-15 10:12
5	1505003-05	Water	May-06-15 07:20	May-11-15 10:12
6	1505003-06	Water	May-06-15 07:20	May-11-15 10:12
7	1505003-07	Water	May-06-15 07:20	May-11-15 10:12
8	1505003-08	Water	May-06-15 07:20	May-11-15 10:12
9	1505003-09	Water	May-06-15 07:20	May-11-15 10:12
10	1505003-10	Water	May-06-15 07:20	May-11-15 10:12
11	1505003-11	Water	May-06-15 07:20	May-11-15 10:12
12	1505003-12	Water	May-06-15 07:20	May-11-15 10:12
13	1505003-13	Water	May-06-15 07:20	May-11-15 10:12
14	1505003-14	Water	May-06-15 07:20	May-11-15 10:12
15	1505003-15	Water	May-06-15 07:25	May-11-15 10:12
1	1505004-01	Water	May-11-15 07:00	May-11-15 10:12
2	1505004-02	Water	May-11-15 07:00	May-11-15 10:12
3	1505004-03	Water	May-11-15 07:00	May-11-15 10:12
4	1505004-04	Water	May-11-15 07:00	May-11-15 10:12
5	1505004-05	Water	May-11-15 07:00	May-11-15 10:12
6	1505004-06	Water	May-11-15 07:00	May-11-15 10:12
7	1505004-07	Water	May-11-15 07:00	May-11-15 10:12
8	1505004-08	Water	May-11-15 07:00	May-11-15 10:12

Environmental Protection Ageney Region 5
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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

9	1505004-09	Water	May-11-15 07:00	May-11-15 10:12
10	1505004-10	Water	May-11-15 07:00	May-11-15 10:12
11	1505004-11	Water	May-11-15 07:00	May-11-15 10:12
12	1505004-12	Water	May-11-15 07:00	May-11-15 10:12
13	1505004-13	Water	May-11-15 07:00	May-11-15 10:12
14	1505004-14	Water	May-11-15 07:00	May-11-15 10:12
15	1505004-15	Water	May-11-15 07:05	May-11-15 10:12

Environmental Protection Agency Region 5
Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

1 (1505003-01) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**2.63**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**40.7**			1.00	"	"	"	"	"
Zinc	**132**			10.0	"	"	"	"	"

2 (1505003-02) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**4.77**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**44.4**			1.00	"	"	"	"	"
Zinc	**55.3**			10.0	"	"	"	"	"

3 (1505003-03) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**4.79**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**39.3**			1.00	"	"	"	"	"
Zinc	**88.8**			10.0	"	"	"	"	"

4 (1505003-04) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**6.26**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**66.8**			1.00	"	"	"	"	"
Zinc	**57.2**			10.0	"	"	"	"	"

5 (1505003-05) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.07**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**272**			1.00	"	"	"	"	"
Zinc	**34.2**			10.0	"	"	"	"	"

Environmental Protection Agency Region 5
Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

6 (1505003-06) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.70**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**362**			1.00	"	"	"	"	"
Zinc	**21.4**			10.0	"	"	"	"	"

7 (1505003-07) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**11.7**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**331**			1.00	"	"	"	"	"
Zinc	**19.5**			10.0	"	"	"	"	"

8 (1505003-08) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**22.5**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**69.9**			1.00	"	"	"	"	"
Zinc	**16.6**			10.0	"	"	"	"	"

9 (1505003-09) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**12.7**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**42.5**			1.00	"	"	"	"	"
Zinc	**15.1**			10.0	"	"	"	"	"

10 (1505003-10) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.94**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**38.4**			1.00	"	"	"	"	"
Zinc	**14.4**			10.0	"	"	"	"	"

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Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

11 (1505003-11) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.72**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**37.5**			1.00	"	"	"	"	"
Zinc	**14.5**			10.0	"	"	"	"	"

12 (1505003-12) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.39**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**34.8**			1.00	"	"	"	"	"
Zinc	**13.6**			10.0	"	"	"	"	"

13 (1505003-13) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.23**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**33.1**			1.00	"	"	"	"	"
Zinc	**13.1**			10.0	"	"	"	"	"

14 (1505003-14) Water Sampled: May-06-15 07:20 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.20**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**32.8**			1.00	"	"	"	"	"
Zinc	**13.0**			10.0	"	"	"	"	"

15 (1505003-15) Water Sampled: May-06-15 07:25 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**3.00**			0.500	ug/L	1	B15E026	May-18-15	May-18-15
Copper	**31.4**			1.00	"	"	"	"	"
Zinc	**12.3**			10.0	"	"	"	"	"

Environmental Protection Agency Region 5
Chicago Regional Laboratory

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

1 (1505004-01) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**8.11**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**31.1**			1.00	"	"	"	"	"
Zinc	**64.0**			10.0	"	"	"	"	"

2 (1505004-02) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**1.46**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**14.7**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

3 (1505004-03) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**1.72**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**20.0**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

4 (1505004-04) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.933**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**13.0**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

5 (1505004-05) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.862**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**12.3**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

6 (1505004-06) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.795**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**14.2**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

7 (1505004-07) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.769**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**14.2**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

8 (1505004-08) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.691**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**13.3**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

9 (1505004-09) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.774**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**9.60**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

10 (1505004-10) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.715**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**7.57**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified)
US EPA Region 5 Chicago Regional Laboratory

11 (1505004-11) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.611**			0.500	ug/L	1	B15E027	May-18-15	May-18-15
Copper	**7.04**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

12 (1505004-12) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.655**			0.500	ug/L	1	B15E027	May-18-15	May-19-15
Copper	**7.30**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

13 (1505004-13) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.644**			0.500	ug/L	1	B15E027	May-18-15	May-19-15
Copper	**7.37**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

14 (1505004-14) Water Sampled: May-11-15 07:00 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.631**			0.500	ug/L	1	B15E027	May-18-15	May-19-15
Copper	**7.09**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

15 (1505004-15) Water Sampled: May-11-15 07:05 Received: May-11-15 10:12

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	**0.621**			0.500	ug/L	1	B15E027	May-18-15	May-19-15
Copper	**7.05**			1.00	"	"	"	"	"
Zinc	**U**			10.0	"	"	"	"	"

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Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified) - Quality Control
US EPA Region 5 Chicago Regional Laboratory

Batch B15E026 - 200.8/no digestion

Blank (B15E026-BLK1) — Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	U			0.500	ug/L						
Copper	U			1.00	"						
Zinc	U			10.0	"						

LCS (B15E026-BS1) — Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	19.3			0.500	ug/L	20.00		96.6%	85-115		
Copper	19.1			1.00	"	20.00		95.4%	85-115		
Zinc	19.0			10.0	"	20.00		95.2%	85-115		

Duplicate (B15E026-DUP1) — Source: 1505003-01 — Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	2.60			0.500	ug/L		2.63			1.27	20
Copper	40.9			1.00	"		40.7			0.294	20
Zinc	131			10.0	"		132			0.892	20

Duplicate (B15E026-DUP2) — Source: 1505003-11 — Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	3.55			0.500	ug/L		3.72			4.68	20
Copper	36.4			1.00	"		37.5			2.94	20
Zinc	14.1			10.0	"		14.5			2.36	20

Matrix Spike (B15E026-MS1) — Source: 1505003-01 — Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	22.9			0.500	ug/L	20.00	2.63	101%	75-125		
Copper	61.0			1.00	"	20.00	40.7	101%	75-125		
Zinc	153			10.0	"	20.00	132	105%	75-125		

Environmental Protection Agency Region 5
Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified) - Quality Control
US EPA Region 5 Chicago Regional Laboratory

Batch B15E026 - 200.8/no digestion

Matrix Spike (B15E026-MS2) Source: 1505003-11 Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	23.5			0.500	ug/L	20.00	3.72	98.8%	75-125		
Copper	56.3			1.00	"	20.00	37.5	93.9%	75-125		
Zinc	33.8			10.0	"	20.00	14.5	96.9%	75-125		

Batch B15E027 - 200.8/no digestion

Blank (B15E027-BLK1) Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	U			0.500	ug/L						
Copper	U			1.00	"						
Zinc	U			10.0	"						

LCS (B15E027-BS1) Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	19.4			0.500	ug/L	20.00		97.2%	85-115		
Copper	18.3			1.00	"	20.00		91.6%	85-115		
Zinc	18.6			10.0	"	20.00		93.1%	85-115		

Duplicate (B15E027-DUP1) Source: 1505004-01 Prepared & Analyzed: May-18-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	8.13			0.500	ug/L		8.11			0.278	20
Copper	31.4			1.00	"		31.1			1.09	20
Zinc	64.7			10.0	"		64.0			1.01	20

Duplicate (B15E027-DUP2) Source: 1505004-11 Prepared: May-18-15 Analyzed: May-19-15

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	0.734			0.500	ug/L		0.611			18.3	20
Copper	7.43			1.00	"		7.04			5.32	20
Zinc	3.23			10.0	"		3.04			6.13	20

Environmental Protection Agency Region 5
Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Metals by ICP-MS using EPA 200.8 (modified) - Quality Control
US EPA Region 5 Chicago Regional Laboratory

Batch B15E027 - 200.8/no digestion

Matrix Spike (B15E027-MS1) **Source: 1505004-01** **Prepared & Analyzed: May-18-15**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	28.4			0.500	ug/L	20.00	8.11	101%	75-125		
Copper	50.7			1.00	"	20.00	31.1	98.2%	75-125		
Zinc	84.3			10.0	"	20.00	64.0	101%	75-125		

Matrix Spike (B15E027-MS2) **Source: 1505004-11** **Prepared: May-18-15 Analyzed: May-19-15**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Lead	21.1			0.500	ug/L	20.00	0.611	102%	75-125		
Copper	26.6			1.00	"	20.00	7.04	97.8%	75-125		
Zinc	23.1			10.0	"	20.00	3.04	100%	75-125		

Environmental Protection Agency Region 5
Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, Drinking Water	Project: Flint, Michigan	
77 West Jackson Boulevard	Project Number: [none]	**Reported:**
Chicago IL, 60604	Project Manager: Miguel Del Toral	May-26-15 09:43

Notes and Definitions

U	Not Detected
NR	Not Reported

Environmental Protection Agency Region 5

Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

WORK ORDER **Printed: 5/18/2015 2:56:59PM**

1505004

US EPA Region 5 Chicago Regional Laboratory

Client:	**Water Division, Drinking Water**	**Project Manager:**	**Greg Mitsakopoulos**
Project:	**Flint, Michigan**	**Project Number:**	**[none]**

Report To:

Miguel Del Toral	77 West Jackson Boulevard	Phone: (312) 886-5253
Water Division, Drinking Water	Chicago, IL 60604	Fax: (312) 886-2001

Date Due:	Jul-12-15 15:00 (60 day TAT)		
Received By:	Robert Snyder	Date Received:	May-11-15 10:12
Logged In By:	Robert Snyder	Date Logged In:	May-11-15 17:00

Samples Received at:	22°C
Sample tags/labels	Yes
Seals Intact	Yes
Received on ice	No
Paperwork Included	Yes

Analysis	Due	TAT	Expires	Comments
1505004-01 1 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-02 2 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-03 3 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-04 4 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-05 5 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	

WORK ORDER

Printed: 5/18/2015 2:56:59PM

1505004

US EPA Region 5 Chicago Regional Laboratory

Client:	Water Division, Drinking Water	Project Manager:	Greg Mitsakopoulos
Project:	Flint, Michigan	Project Number:	[none]

Analysis	Due	TAT	Expires	Comments
1505004-06 6 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-07 7 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-08 8 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-09 9 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-10 10 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-11 11 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-12 12 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-13 13 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
1505004-14 14 [Water] Sampled May-11-15 07:00 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:00	

WORK ORDER

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1505004

US EPA Region 5 Chicago Regional Laboratory

Client:	**Water Division, Drinking Water**	**Project Manager:**	**Greg Mitsakopoulos**
Project:	**Flint, Michigan**	**Project Number:**	**[none]**

Analysis	Due	TAT	Expires	Comments
1505004-15 15 [Water] Sampled May-11-15 07:05 (GMT-06:00) Central Time (US & Canada)				**pH = 7**
Metals ICP-MS (DW)	Jul-12-15 12:00	60	Nov-07-15 07:05	
Metals ICP (DW)	Jul-12-15 12:00	60	Nov-07-15 07:05	

Reviewed By

Date

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Friday, October 02, 2015 12:46 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ); Benzie, Richard (DEQ)
Cc: Poy, Thomas
Subject: Flint schematic in OEL

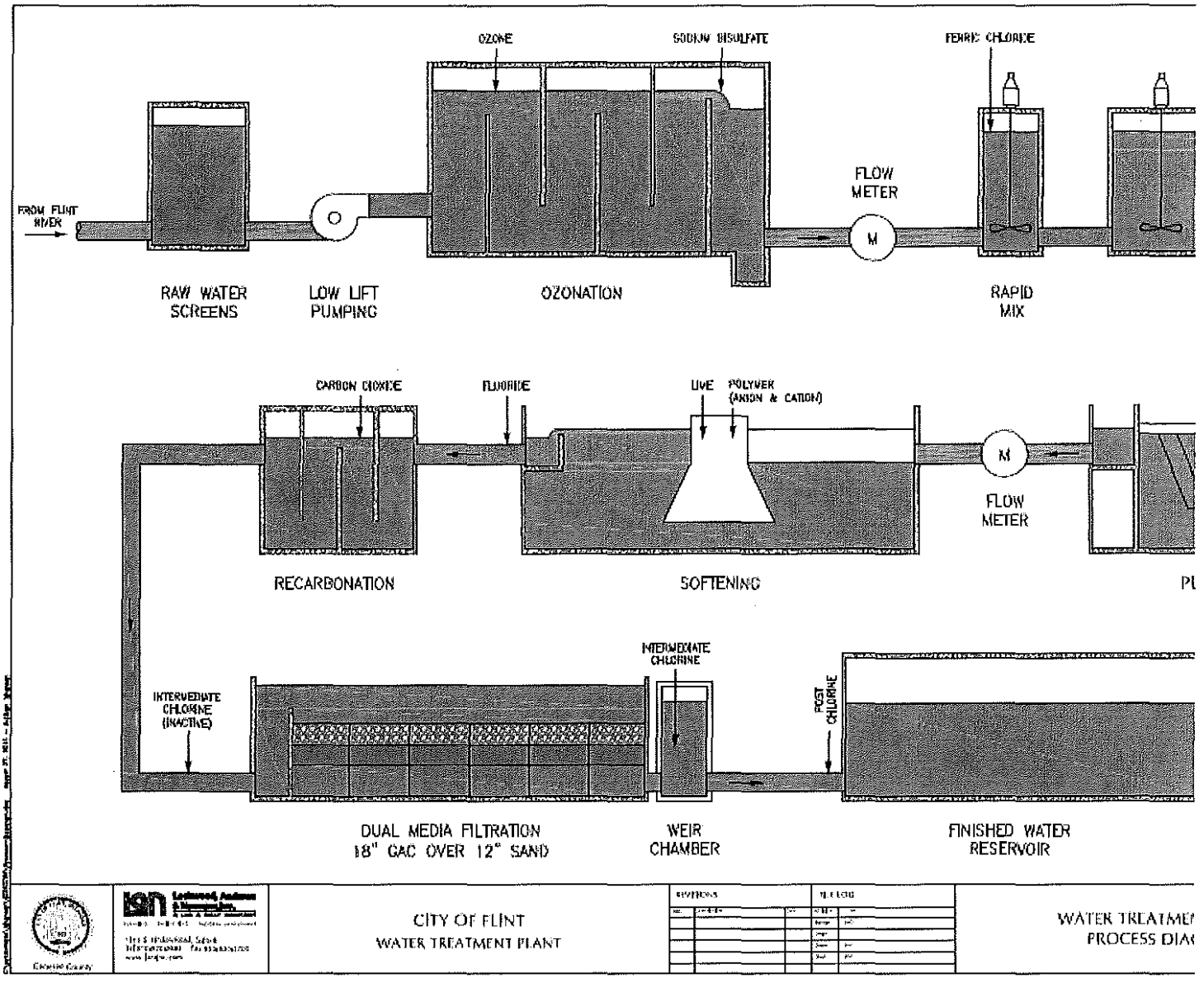
Hi, all. Sorry to have bugged you about this; I thought Mike and Darren wanted something more in detail that what was provided in the OEL, and they have the OEL. I asked if they need further detail than this. We'll find out.
Jennifer

From: Porter, Andrea
Sent: Friday, October 2, 2015 9:56 AM
To: Crooks, Jennifer; Schock, Michael; Lytle, Darren
Cc: Poy, Thomas; Deltoral, Miguel
Subject: RE: Flint schematic

Hi All,

If you need a schematic for the Flint water treatment plant, there's one included in the August 2015 OEL report posted on City of Flint's website.

Source = https://www.cityofflint.com/wp-content/uploads/Flint-TTHM-Operational-Evaluation-Report-August-2015.pdf



Hope that helps,
Andrea Porter

Environmental Engineer
Ground Water & Drinking Water Branch
U.S. EPA, Region 5 (WG-15J)
77 W. Jackson Blvd.
Chicago, IL 60604
Phone: 312-886-4427
Fax: 312-697-2656

From: Crooks, Jennifer
Sent: Thursday, October 01, 2015 5:02 PM
To: Schock, Michael; Lytle, Darren
Cc: Poy, Thomas; Deltoral, Miguel; Porter, Andrea
Subject: no Flint schematic yet

I think MI DEQ has been hit hard this week with public inquiries, congressional inquiries, etc., so I have not heard back from them today. Tomorrow is a press release with MI DEQ and EPA. I did send them an email just now to say if they have the schematic, they should email it to you directly since I'm out of the office tomorrow. But I'll be back on Monday, so I'll continue to follow up with them.
Jennifer

Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Monday, December 01, 2014 4:18 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ)
Cc: Brent Wright (bwright@cityofflint.com); Daugherty Johnson (djohnson@cityofflint.com); hcroft@cityofflint.com; Green, Warren; Matta, Samir; mglasgow@cityofflint.com
Subject: Flint THM Operational Evaluation Report Draft
Attachments: Flint-TTHM-OER-DRAFT_toMDEQ.pdf

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
1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 **C** 810.333.3201
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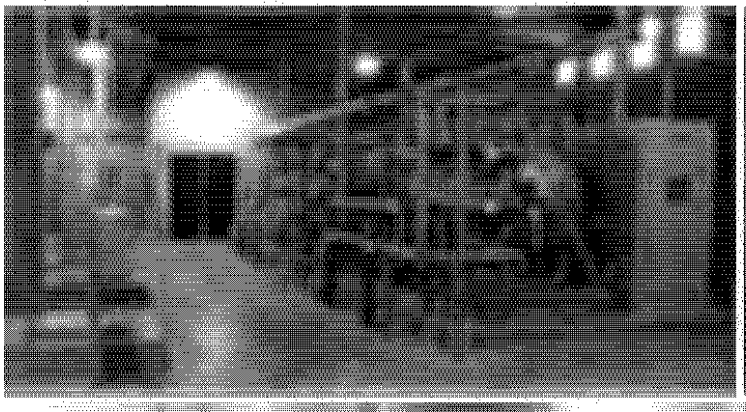
DRAFT

Operational Evaluation Report

City of Flint

Trihalomethane Formation Concern

November 2014





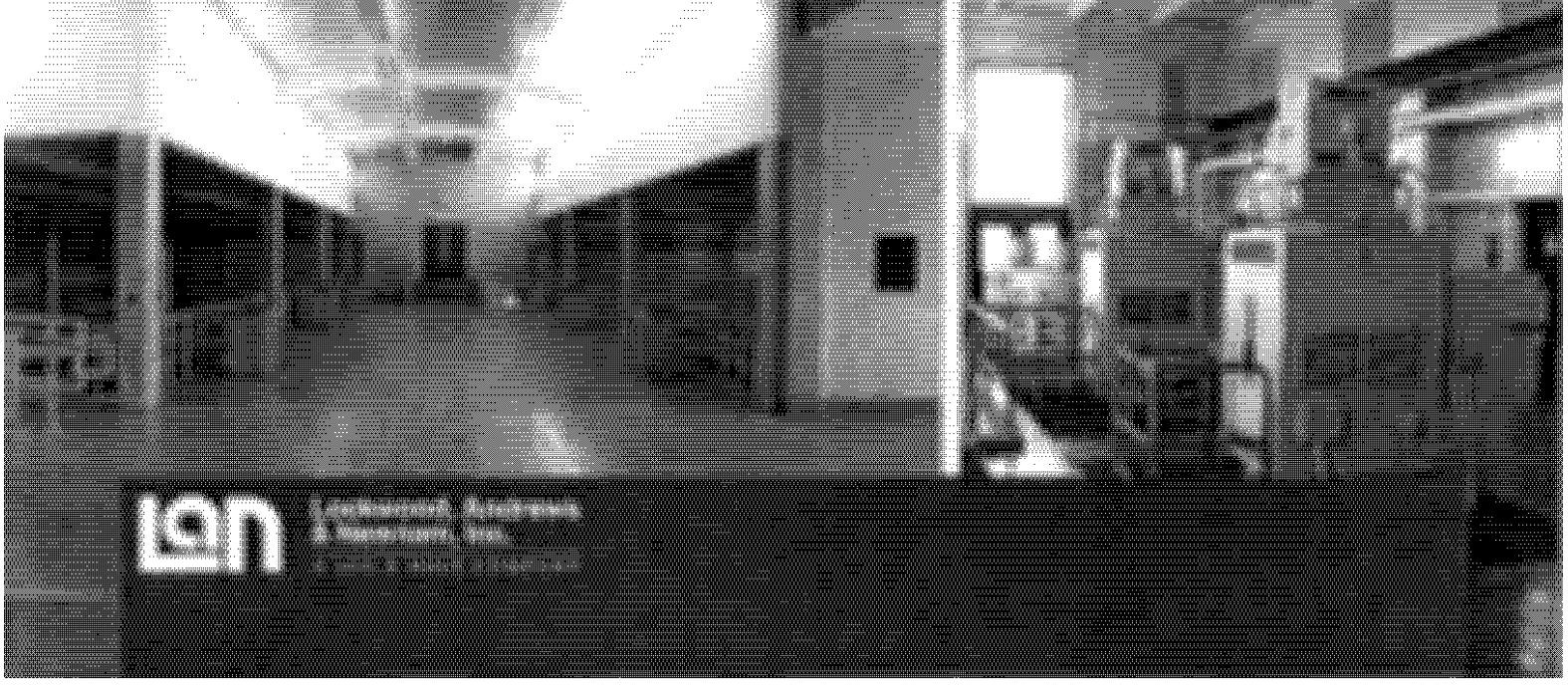


TABLE OF CONTENTS

Executive Summary	1
I. Background	3
A. Water Supply Transition	3
1. Detroit Water & Sewer Department	3
2. Karegnondi Water Authority	3
3. Flint River – Interim Period	3
B. TTHM Pending Violations	3
C. WTP Recent Improvements and Status	4
1. Phase I WTP Improvements	4
2. Past Pilot Study & Testing	4
3. Phase II WTP Improvements for Full Time Operation	5
II. Source Water Evaluation	6
A. Data Analysis	6
B. Conclusions	6
III. Treatment Process Evaluation	7
A. Existing Process Description	7
1. Intake	7
2. Ozone	7
3. Rapid Mix	7
4. Coagulation / Flocculation	7
5. Settling	7
6. Softening	7
7. Recarbonation	8
8. Filtration	8
9. Disinfection	8
10. Clear Well and Pumping	8
B. Jar Testing / Experiments	8
1. Approach	8
2. Protocol	8
3. Considerations	10
4. Results	10
5. Conclusions	10
IV. Distribution System Evaluation	11
A. Infrastructure	11
1. Piping	11
2. Storage	11
3. Pump Stations	11
B. Operations & Maintenance	11
1. Pump Station & Storage Operations	11
2. Booster Disinfection Practices	12
3. Changes in System Demands	12
C. Water System Hydraulic Modeling	12
1. Simulation of Existing System	12
2. Identification of Deficiencies	12

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TABLE OF CONTENTS

V. Recommendations to Minimize Future OEL Exceedances 13
A. Source 13
1. Watershed Management 13
2. Monitoring 13
3. Intake Operations 13
4. Seasonal Strategies 13
5. Upstream Contamination Issues 13
B. Treatment Process 14
1. Operational Recommendations 14
2. Infrastructure Change Recommendations 14
C. Distribution System 15
1. Manage Water Age 15
a. Storage Tanks 15
b. Residence Time in Pipes 15
2. Reduce Disinfectant Demand 15
a. Flushing 15
b. Cast Iron Pipes 15
3. Water Modeling of Recommendations 15
D. Booster Disinfection 15
E. Categorization of Actions 15

VI. Figures
1. Flint WTP Process Diagram

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List of Tables

1. 2014 DBP Test Results 4
2. 2002 WTP Treatment Recommendations 4
3. Flint River Water Quality Characteristics 6
4. Bench Scale Test Mixing Intensities 9
5. Bench Scale Test Chemical Feed Rates 9
6. Action Plan 16

EXECUTIVE SUMMARY

Environmental Protection Agency (EPA) and Michigan Department of Environmental Quality (MDEQ) regulations require that public water suppliers test drinking water quarterly throughout the distribution system for disinfectant by-products (DBP's). Two categories of DBP's, tri-halomethanes (THM) and halo-acetic acids (HAA5), are regulated and must be tested for. The City of Flint began operation of their water treatment plant (WTP) full time with the Flint River as the source on April 25, 2014. Since that time, two quarters of samples taken indicate that future violations are inevitable for total THM without some modifications to the water system. In response, the City hired Lockwood, Andrews & Newnam, Inc. (LAN) to complete this Operational Evaluation Report (OER) in conformance with EPA guidelines with the goal to determine the cause(s) of high levels of THM and evaluate possible solutions.

The EPA promulgated the Stage 2 Disinfectants and Disinfection By-Products Rule (DBPR) in January 2006 which set maximum contaminant levels (MCLs) for total trihalomethanes (TTHM) and HAA5 based on an annual running average, tested quarterly, for a given sampling location. The City of Flint reports levels from 8 sampling test locations. Of the two quarterly sampling cycles since Flint began operating the WTP full time, HAA5 levels have been acceptable but TTHM levels have been high at all 8 sampling sites.

According to the Stage 2 DBPR, the annual average value requires 3 quarters of sampling data with the most current period counting twice. Therefore, the City of Flint has not yet experienced a violation of the TTHM MCL because only 2 quarters of data have been obtained. However, levels recorded indicate the likelihood of an MCL exceedance later this year.

A number of issues have been identified as possibly contributing to the high THM levels measured.

1. Inefficient ozone system functionality which has resulted in increased chlorine feed.
2. Upstream influences in terms of increased chlorine demand.
3. Bypass stream around softening contributed to chlorine demand.
4. Unlined cast iron pipes in the distribution system contributing to chlorine demand.
5. Recirculating water in the distribution system due to less than ideal configuration of Cedar Street and West Side pump stations.
6. Broken valves resulting in stagnant water in some areas.
7. High chlorine demand in filters.
8. High THM formation potential (THMFP) in source water.
9. Less than optimal removal of THM precursors

ACTION PLAN

The City of Flint has signed an agreement with the Karegnondi Water Authority (KWA) to purchase raw water drawn from Lake Huron. The KWA system is currently under construction and expected to be operational by late 2016. The water supply from Lake Huron will have entirely different water quality characteristics from the Flint River and those characteristics are expected to yield drastically reduced DPB formation. With that, non-structural options to help reduce THM levels are much preferred over solutions requiring new construction. Therefore, two categories of actions have been devised: Stage 1 being actions that can be completed relatively quickly without major construction and Stage 2 consisting of either long term actions or solutions requiring major construction. The City has completed or intends to complete Stage 1 Actions by February 16, 2015, the week in which the next quarterly sampling is to be done. Stage 2 actions are to be implemented only if Stage 1

actions are ineffective in adequately reducing TTHM levels and therefore Stage 2 is contingent upon the outcome of Stage 1.

Stage 1 – Immediate Actions

- Hire ozone system manufacturer to troubleshoot ozone system
- Bench scale jar testing
  - Match existing process and access possible areas of improvement
  - Simulate potential modifications to treatment process
  - Evaluate coagulation and flocculation polymer aid feeds to assist with TOC removal
- WTP operational changes
  - Discontinue softening bypass stream to reduce chlorine demand
  - Disinfection of filter beds to reduce chlorine demand
  - Possibly begin coagulation and flocculation polymer aid feeds to assist with TOC removal depending on bench scale test results
- Increase water main flushing efforts to minimize stagnant water
- Water system modeling to identify areas with high water age and potential solutions
  - Cedar Street Pump Station potential recirculation
  - West Side Pump Station potential recirculation
  - Storage tank volume use
  - Possible broken closed valve locations
  - Locations in need of flushing
  - Lower high water levels in storage tanks

Stage 2 – Contingent Actions

- Fix ozone system
- Start feeding coagulation and flocculation polymer aids to lower TOC, if not completed in Stage 1
- Convert to lime and soda ash softening
- Change disinfectant to chloramine or chlorine dioxide until KWA
- Install pre-oxidant feed at intake to optimize ozone disinfection
- Implement advanced treatment for THM precursor removal
- Increased main flushing based on water modeling results
- Continue valve replacements with water model assistance
- Emphasize cast iron pipes on water main replacement priority list

DRAFT

I. BACKGROUND

The City of Detroit Water and Sewer Department (DWSD) has historically provided drinking water for the City of Flint and Genesee County. In the late 1990's growing concern regarding the reliability of the DWSD supply prompted the City of Flint to upgrade their existing water treatment plant (WTP). Those improvements, defined as Phase I, were completed in 2005 and were intended to allow the Flint WTP to operate, using the Flint River as the source, for an extended period of time in the event that supply from the DWSD was temporarily interrupted. Additionally, the Phase I improvements set the stage for Flint to break free from dependence on the DWSD supply and water charges over which they had no control.

A. WATER SUPPLY TRANSITION

1. Detroit Water and Sewer Department (DWSD)

Until recently the Genesee County and Flint region had been provided drinking water by the DWSD. However, due to excessive cost increases and reliability issues with the DWSD system other options had to be explored.

2. Karegnondi Water Authority (KWA)

In 2010 the Karegnondi Water Authority (KWA) was formed for the purpose of developing a new water supply from Lake Huron to serve the region in lieu of the DWSD supply and the City of Flint elected to join. The KWA expects the new system which is currently being constructed to become operational in the fall of 2016.

3. Flint River – Interim Period

With a renewing water supply agreement between Flint and the DWSD being terminated by the DWSD (effective April 30, 2014) and the KWA system not expected to be operational until late 2016, the City of Flint decided to initiate operation of the existing WTP full time utilizing the Flint River as the interim water source. A variety of WTP improvements were necessary for the Flint plant to become a full time plant. For purposes of this report, Phase II improvements to the Flint WTP are improvements which have been made to allow the plant to operate full time with either the Flint River as the source or the KWA supply as the source.

B. TTHM PENDING VIOLATIONS

The calculation for determining if the MCL has been violated for TTHM is:

(2 x current quarter value + previous 2 quarter values) / 4

Flint has completed tests for 2 quarters and therefore has not violated an MCL limit to date. However, the third quarter of sample data is likely to provide MCL exceedances at all 8 sampling sites. Test results are tabulated below.

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TABLE 1 – 2014 DBP TEST RESULTS						
Sample Location	TTHM			HAA5		
	1st Qrt 5/21/14	2nd Qrt 8/21/14	3rd Qrt	1st Qrt 5/21/14	2nd Qrt 8/21/14	3rd Qrt
1) 3719 Davison - McDonalds	162.4	145.3		64	43	
2) 822 S. Dort Hwy - BP Gas Sta.	111.6	112.0		52	40	
3) 3302 S. Dort Hwy – Liquor Pal.	96.5	127.2		48	31	
4) 3606 Corunna – Taco Bell	106.4	181.3		55	24	
5) 2501 Flushing – Univ. Market	75.1	196.2		38	17	
6) 3216 MLK – Salem Housing	82.2	112.4		41	25	
7) 5018 Clio – Rite Aid	88.2	144.4		49	30	
8) 6204 N. Saginaw – N. Flint Auto	79.2	118.3		50	37	

TTHM MCL = 80 ug/l
HAA5 MCL = 60 ug/l

C. WATER TREATMENT PLANT RECENT IMPROVEMENTS & STATUS

1. Phase I WTP Improvements

Since 1965, the Flint WTP has remained a secondary or backup supply system to the DWSD primary supply. Typically the secondary supply for a public water system is expected to be needed only during emergency situations and normally is designed for short term operation such as providing the average daily demand for a few days. Conversely, Phase I improvements were designed with the intent to upgrade the Flint WTP in order to allow for an extended short term period (6 weeks) because of the perceived high risk that the DWSD supply would fail and remain out of service for an extended duration. Regardless, the Flint WTP was still intended to serve as a standby plant and as such the Phase I improvements lacked redundancies that would be required for a primary supply WTP.

2. Past Pilot Study & Testing

During design of the Phase I improvements a treatability study was completed by Alvord, Burdick & Howson, LLC (AB&H) in 2002. The Treatability Study evaluated the current treatment processes that are in place at the Flint WTP today with the Flint River as the source. The report recommended the following:

TABLE 2 – 2002 WTP TREATMENT RECOMMENDATIONS			
Treatment	Purpose	Point of Application	Dosage (mg/l)
Sodium permanganate	Zebra mussel control	Intake	0.3
Ozone	Taste & odor removal, disinfection	Diffusor basin	1.5
Ferric chloride	Coagulation	Rapid mix	40
Coag aid polymer	Turbidity & TOC removal	Rapid mix	2.0
Floc aid polymer	Turbidity & TOC removal	Floc basin	0.05
Lime	Softening	Softening basin	175
Soda ash	Softening	Softening basin	52
Carbon dioxide	pH adjustment	Recarb basin	37
Media filters	Filtration	Na	Na
Chlorine	Disinfection	Filter effluent	1.0

Of the recommended items, zebra mussel control, coagulant and flocculation polymer aids, and soda ash feed have not been incorporated into the treatment process.

3. Phase II WTP Improvements for Full Time Operation

Phase II WTP improvements are those needed to convert the Flint WTP from a back-up supply to a primary supply plant. A number of improvements have already been constructed as they were necessary to operate full time, treating water from the Flint River. The improvements under the title of Phase II that have been completed or are nearly complete include upgrades to the lime sludge lagoon, the lime sludge lagoon decant and disposal system, decant pump station and force main, installation of mid-point chlorination before filtration, and upgrade of the electric feed sub-station.

Additional improvements to the Flint WTP that are to be completed to become part of the normal treatment process using water supplied by the KWA are:

- New oxygen and nitrogen storage facilities for the ozone system (under construction)
- New coagulant feed system
- Electrical
  - Pump Station #4 upgrades (under construction)
  - SCADA and controls upgrades
  - Filter transfer pump station feeders
- Installation of the future raw water feed connection point for the KWA (under construction)
- Pump replacements and VFD installation in the low and high service pump station (under construction)
- Filter transfer pump station to Dort Reservoir
- Facility security improvements

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II. SOURCE WATER EVALUATION

A. DATA ANALYSIS

Based on past data collected and the 2002 Treatability Study by AB&H, the Flint River water quality varies seasonally with higher hardness and alkalinity experienced in the winter. Higher magnesium concentrations are also experienced in the winter, adding difficulty to the settling process due to neutrally buoyant floc. General water quality average characteristics recorded for the 2002 Treatability Study as compared with average characteristics recorded this year are shown in Table 3 below.

TABLE 3 – FLINT RIVER WATER QUALITY CHARACTERISTICS

Period	Turbidity NTU	TOC Mg/l	Alkalinity Mg/l	Hardness Mg/l as CaCO3	pH	Total Col. Count/day
2001 Apr–Oct	7.9	9.4	215	272	8.1	870-1230 (7300 max)
2014 May–Oct	8.3	10.3 5/22/14	207	252	8.2	1900-9000 (48,300 max)

Other than total Coliform, the Flint River characteristics do not appear to have changed significantly over the past 10+ years. Note that further investigation by City staff revealed a sewer leak upstream of the plant that may have contributed to the total Coliform count. The leak was subsequently repaired.

B. CONCLUSIONS

Considering the minor changes in Flint River water quality, much of the information contained in the 2002 Treatability Study by AB&H remains relevant today. Data from that report assumed to be consistent today include the following:

- Flint River is influenced by groundwater from a dolomitic aquifer
- Hardness varies seasonally with higher hardness and alkalinity in the winter
- Hardness, alkalinity, magnesium concentrations tend to be reduced by run-off
- Total THMFP is likely 380-440 micrograms per liter as measured between April 2001 and January 2002. The City intends to re-test the raw water to confirm the THMFP has not changed. Results are pending.

In development of the 2002 Treatability Study, processes were simulated which resulted in low THMFP. Therefore, information contained in that report will be used to assist with establishing a baseline jar testing procedure as discussed further in Section III.

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III. TREATMENT PROCESS EVALUATION

A. EXISTING PROCESS DESCRIPTION

The existing WTP consists of an intake with screening from the Flint River, low lift pumping, ozonation, rapid mix, flocculation, settling, softening, recarbonation, filtration, storage and high service pumping. A process diagram is shown as Figure 1.

1. Intake

A 72" diameter pipe draws water from the Flint River through 2 traveling screens to the low lift pump structure. No chemicals are currently fed for Zebra mussel control or pre-oxidation as recommended by the 2002 Treatability Study. Manual removal of zebra mussels proved to be more economical than installation of chemical feed equipment considering the short term need.

2. Ozone

There are 2 ozone generators designed to provide adequate ozone for a WTP flow of up to 36 mgd. There are 3 ozone contact basins. The ozone generators were designed to produce 900 lbs/day at 10% concentration and up to 1300 lbs/day at 6% concentration each. Recent readings have indicated a production rate of approximately 700 lbs/day at 4% concentration. While serving the purposes of taste and odor control and disinfection, it is possible the current ozone feed might not be optimized to realize additional TOC removal benefits demonstrated by previous tests. Also, less than optimal ozonation has led to increased chlorine feed.

3. Rapid Mix

East and West rapid mix chambers allow chemical feed prior to the flocculation basins. Each rapid mix chamber is equipped with a 5 hp mixer.

4. Coagulation / Flocculation

The WTP contains two equally sized flocculation basins, east and west, and each basin provides tapered or gradually slowed mixing from inlet to outlet. There are fifteen 2 hp mixers for each basin with VFDs to control mixing speed. The 2002 Treatability Study recommended feeding both coagulation and flocculation polymer aids. Neither polymer aid is being used today because turbidity and TOC removals have been sufficient to meet regulatory requirements.

5. Settling

Primary clarification takes place within 3 basins containing plate settlers. The settlers are operating as designed.

6. Softening

Again, there are two basins for softening: east and west. Each basin is 120' in diameter and contains a solids contact softening unit. Each softening basin/unit has a design capacity of 18 mgd. Low lift pumping limitations, flow control to the basins, and fluctuating demands have made it difficult for WTP staff to stabilize the softening process. Softening is accomplished by feeding lime. The decision was made by the City not to feed soda ash in order to remove non-carbonate hardness because acceptable hardness levels could be achieved with lime feed only and softening is short term until Lake Huron water becomes available.

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7. Recarbonation

Recarbonation for pH adjustment is accomplished in east and west recarbonation basins between and to the north of the softening basins. Carbon dioxide storage and feed equipment is located west of the recarbonation basins.

8. Filtration

Filtration is accomplished with 12 dual media filters, equally sized and designed to filter 3.0 mgd each. Media consists of 12" of sand and 18" of anthracite. The filters have been operated intermittently over the years due to the standby nature of the WTP and until recently, chlorine injection took place downstream of the filters. It is possible some microbial growth has developed in the filters.

9. Disinfection

Limited disinfection is provided by ozonation, but the primary form of disinfection is chlorine fed prior to filtration and prior to finish water storage / high service pumping. The intermediate chlorine injection location was recently constructed under the Phase II, Segment 1 contract.

10. Clear Well & Pumping

The pump building sits adjacent to a 3 MG clear well and contains both low and high service pumps.

B. JAR TESTS / EXPERIMENTS

1. Approach

There are several well practiced methods by which DBPs can be reduced. First, the disinfectant can be changed to an alternate that has a lower tendency to form DBPs. Second, additional treatment systems such as activated carbon or air stripping (depending on the nature of the precursors) can be added to remove DBP precursors. Lastly, the existing treatment processes can be optimized to remove as much DBP precursor as possible. Of these options, optimizing existing treatment processes is the only strategy that does not require the construction of new and expensive facilities. It is anticipated that Flint will be receiving Lake Huron water in approximately two years and this water will have a completely different chemistry from the Flint River. Major process changes instituted to address THM levels using Flint River water are likely to be unnecessary for Lake Huron water and may even be inappropriate. Therefore, those options which require addition of new treatment processes are undesirable at this time. In recognition of this upcoming change in water source, this study will concentrate on improving the existing processes, rather than adding new ones. New treatment processes will only be recommended if operational changes to the existing treatment train prove ineffective.

Recent sample test results suggest that most of the DBPs are formed in the distribution system rather than within the treatment plant. Therefore, the most logical approach is to reduce the DBP formation potential (DBPFP) rather than simply lowering the levels of DBPs leaving the plant. During bench scale testing, formation potential (FP) levels will be the primary indicator of success or failure of any proposed process modifications.

2. Protocol

Bench scale pilot testing is intended to reflect actual plant operating and hydraulic conditions so the bench scale treatment units will be sized based on various dimensionless factors to ensure the pilot treatment matches the actual system. Bench scale ozonation is not practical due to time and cost limitations. Therefore, water

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samples will be withdrawn following the plant ozone basin. These samples will be transported to the laboratory where they will be dispensed into square testing jars. The jars will act as rapid mix, three-stage flocculation, and settling. Rapid mix and flocculation conditions will be matched to the plant based on "Gt" values. The "G" value is a measure of the mixing intensity and is a function of mix time, viscosity of the liquid, and mixing power applied to the water. "Gt" then, is a size scaling factor where time has been accounted for. Settling time will be scaled to match the shorter settling depth of the testing jars. After settling, samples will be decanted from the test jars. The decanted samples will then be lime softened; softening conditions will be similarly matched on the basis of "Gt". Fluoride will be added and carbon dioxide sparged into the samples to reduce the pH. The water will then be vacuum filtered through filter paper, sized to simulate the plant's dual media filters. The samples will be dosed with excess chlorine and allowed to react for seven days before testing for DBPs to determine the formation potential.

Although these conditions may be refined based on new information, we anticipate the following:

TABLE 4 – BENCH SCALE TEST MIXING INTENSITIES

Process	G	Duration
Ozonation	Plant	-
Rapid Mix	350	25 sec
Flocculation, Stage 1	50	9 min
Flocculation, Stage 1	25	9 min
Flocculation, Stage 1	12	9 min
Settling	na	10 min
Softening	TBD	10 min
Recarbonation	na	na

It is expected that the primary variables during the testing will be chemical additions and chemical dosages. Specific chemicals and dosages used for initial testing conditions will be selected to reflect current plant usage and the recommendations of the 2002 Treatability Study:

TABLE 5 – BENCH SCALE TEST CHEMICAL FEED RATES

Chemical	Current Usage	2002 Study
Ozonation	4.66 mg/l	1.5 mg/l
Ferric Chloride	7.7 mg/l	40 mg/l
Coagulant Aid Polymer	Not used	2.0 mg/l
Flocculation Aid Polymer	Not used	0.05 mg/l
Lime	120 mg/l	175 mg/l
Soda Ash	Not used	52 mg/l
Cationic Softening Polymer	3.13 mg/l	Not used
Anionic Softening Polymer	0.88 mg/l	Not used
Fluoride	0.45 mg/l	1 mg/l
Carbon Dioxide	32 mg/l	37 mg/l
Chlorine	6.3 mg/l	1 mg/l

3. Considerations

The 2002 Treatability Study did not note significant formation of DBPs. This may be a function of different Flint River water chemistry at that time. However, recognizing the considerable differences in chemical usage and dosages between that study and current operations, those differences in chemical use and dosage are an obvious starting point for optimizing treatment to prevent DBP limit exceedance.

Although it is believed that optimization of current treatment can correct the DBP issue, should optimization of present treatment prove insufficient, alternate residual disinfectants (chloramines and chlorine dioxide) will be investigated as additional treatment measures.

4. Results

[To be completed following jar testing and experimentation]

5. Conclusions

[To be completed following jar testing and experimentation]

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IV. DISTRIBUTION SYSTEM EVALUATION

EPA guidance for the distribution evaluation portion of an OER is focused on identification and isolation of a specific portion of the distribution system that led to the exceedance. The circumstances of Flint's apparent pending TTHM exeedances are unusual in that a new supply has been implemented which clearly corresponds to the high TTHM sample results. Despite obvious implications to the primary cause of increased TTHM levels, value remains in evaluating the distribution system as there may still be distribution improvements that can be made to help alleviate the problem.

Evaluation of the distribution system, including modeling, was recently added to LAN's scope of services. When finished, information will be provided to complete the following topics in this section.

A. INFRASTRUCTURE

1. Piping

According to the most recent MDEQ Sanitary Survey, the distribution system is estimated to contain 70% cast iron, 20% ductile iron, 2% concrete and 8% steel water mains. Unlined cast iron pipe can become pitted, allowing colonization sites for microorganisms leading to chlorine demand. Additionally, much of the piping in the system is aged and in poor condition. Increased chlorine demand could be resulting from biofilm in older pipes and from main breaks/repairs.

The City utilizes City Point software and GPS equipment to document main breaks and prioritize replacements. Areas that have been targeted for main replacements include Fenton Road, Atherton Road, Dort Highway, Averil Street, and Boulevard Drive. The extent of contribution is not known but any water main replacement project will contribute to decreasing chlorine demand somewhat if constructed properly.

2. Storage

[To be completed]

- *Appropriate capacity*
- *Mixing, baffling, other provided to prevent stagnant water*
- *Condition*

3. Pump Stations

[To be completed]

- *Condition*
- *Pump capacity evaluation*
- *Valve condition and pressure zones*

B. OPERATIONS AND MAINTENANCE

1. Pump Station & Storage Operations

[To be completed]

- *Control of pressure districts*
- *WTP Pump Station (No. 4)*
- *Cedar Street Pump Station*
- *Westside Pump Station*

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- *Torrey Road Pump Station*
- *High and low levels in tanks*

2. Booster Disinfection Practices

Booster disinfection is provided at the Cedar Street and Westside pump stations. Sodium hypochlorite is applied while the reservoirs are being filled.

3. Changes in System Demands

[To be competed]

- *Long term decline in demands*
- *Short term fluctuations – max day in winter due to high volume of main breaks*

C. WATER SYSTEM HYDRAULIC MODELING

[To be completed]

1. Simulation of Existing System

Match existing conditions, particularly chlorine residual. We have chlorine feed data at plant and residuals at 10 locations in each MOR, May-October.

2. Identification of Deficiencies

Specific issues to look at:

Worst case at minimum daily demands
Water age in entire system
Recirculating water through pump stations
Use of storage tanks
Indications of broken valves
Effectiveness of booster disinfection

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V. RECOMMENDATIONS TO MINIMIZE FUTURE OEL EXCEEDANCES

A. SOURCE

The City of Flint has already committed to the change from the Flint River as the water source to Lake Huron under the KWA system, planned for late 2016. The risk of future TTHM limit violations will decline substantially with the use of water from Lake Huron due to much lower DBP precursors. It is important to recognize that the Flint River will become strictly an emergency supply when the KWA supply becomes available and any investments toward the Flint River should be contemplated accordingly. Recommendations discussed below in this section apply to the Flint River as the source.

Reverting to supply from the DWSD until the KWA supply is available as an option. However, the DWSD has stipulated that a $4 million connection fee would apply and current water rates would include approximately $900,000/ month flat fee plus usage charges. Therefore, utilizing the DWSD for interim supply is cost prohibitive under the terms defined by the DWSD.

1. Watershed Management

A volunteer group entitled the Watershed Coalition performs various tasks related to managing the Flint River watershed such as spring cleanups and annual benthic studies to evaluate the river 'health'. No additional action is recommended at this time.

2. Monitoring

The City documents typical raw water characteristics as part of standard preparation of Monthly Operating Reports (MOR). No changes are recommended at this time.

3. Intake Operations

The 2002 Treatability Study recommended pre-oxidation in the form of sodium permanganate as a feed at the intake. However, pre-oxidation with sodium permanganate is unlikely to provide significant oxidizing of organics beyond that provided by ozonation. It is possible the addition of hydrogen peroxide would enhance the ozone process.

4. Seasonal Strategies

Past data indicates the Flint River is influenced by groundwater and in particular, dolomitic spring water. The result is hard water with high concentrations of magnesium and sulfate. Also, hardness and alkalinity are higher during the winter. Upon initiation of supply from the Flint River, the City made the decision to soften with lime only to focus on removal of carbonate hardness. One potential modification that could assist with TOC removal and thus decrease THMFP would be lime and soda ash softening. If implemented soon, the procedural change would be timely as it would also address increased hardness expected going into this winter.

5. Upstream Contamination Issues

Upstream contamination issues are extremely difficult to prevent and even if detected are difficult to locate. Evaluation of raw water data collected for MORs is the easiest manner in which to detect upstream contamination issues because the data is already collected for treatment purposes. In fact, high total Coliform readings signaled a potential issue recently that the City identified and removed.

An upstream monitoring and warning system could be established to attempt to detect spill event type contamination early enough to cease intake prior to the

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contamination reaching the WTP. However, given the imminent conversion to the KWA supply, the period of full time use would likely be far too short to achieve payback on the capital expenditures.

B. TREATMENT PROCESS

1. Operational Recommendations

- Coagulation and flocculation polymer aids: The 2002 Treatability Study suggested the use of coagulation and flocculation polymer aids. These polymer aids were shown in the 2002 Treatability Study to increase TOC removal and thereby reduce THMFP. Further evaluation will be completed during jar testing.
- Discontinue softening bypass: The City was previously bypassing a portion of flow around the softening basins because hardness levels did not warrant softening of the full stream. However, this practice was discontinued because it was believed the bypass stream was contributing to chlorine demand and preliminary data has supported that belief. Chlorine demand dropped 0.5 – 1.0 mg/l following elimination of the bypass stream in early November 2014.
- Soften with lime and soda ash: Research has shown that enhanced softening with both lime and soda ash may provide additional TOC removal. The efficacy of this option will be evaluated during jar testing.
- Disinfection of filter beds: In case there has been microbial growth it is recommended the filters be 'shock' treated with chlorine and rinsed. A chlorine injection point was added upstream of the filters during the first segment of Phase II so future growth in the filters should not be an issue.
- Optimization of all existing treatment processes: Depending on bench scale testing conditions and results, slight modifications to all treatment processes might in order to replicate lower DPBFP.

2. Infrastructure Change Recommendations

- Fix and/or replace faulty ozone equipment: Since the ozone equipment was installed it has not been used extensively so the hope is that major components remain in good condition and the system can be easily modified to restore proper functionality. The City has scheduled the equipment manufacturer to field inspect the system on December 15, 2014.
- Change disinfectant to chloramine or chlorine dioxide: If other options prove to be ineffective, conversion to another disinfectant should be fully evaluated. Various characteristics of chloramination indicate an advantage over chlorine dioxide, but a full analysis would provide clarity as to which would be preferred.
- Install pre-oxidant chemical feed: Hydrogen peroxide as a pre-oxidant can enhance the activity of the ozone. This option is listed as a consideration only if problems continue with ozonation.
- Repair upstream sewer leak: a sewer leak upstream of the WTP intake was discovered and has already been repaired by the City.

C. DISTRIBUTION SYSTEM

Recommendations will be incorporated into this report when available. It is anticipated details will be provided for the following topics. [To be completed]

1. ***Manage Water Age***
   a) ***Storage Tanks***
   b) ***Residence Time in Pipes***

2. ***Reduce Disinfectant Demand***
   a) ***Flushing***
   b) ***Cast Iron Pipes***

3. ***Water Modeling of Recommendations***
   Determine best flushing locations to reduce water age
   Changes to storage tank operating levels to reduce water age
   Valves to close/add to improve pressure zones, reduce recirculation
   Optimization of pump station use – smaller pumps? Shut down?
   Evaluate booster disinfection

A number of actions have already been taken in terms of the distribution system. Water main flushing efforts were increased until late November when freezing weather became prevalent. Also, numerous valves that were broken in the closed position and believed to have been contributing to stagnant water were replaced.

D. BOOSTER DISINFECTION

Decreasing chlorine feed at the WTP and adding booster disinfection in the distribution system is an alternative intended to reduce the reaction time at higher concentrations of chlorine to reduce DPB formation. Extensive looping and branching within the existing system complicate how to best implement and utilize booster disinfection. Water system modeling is recommended to determine the most effective feed point locations and dosages. Further discussion and details will be provided when the distribution evaluation results are available.

E. CATEGORIZATION OF ACTIONS

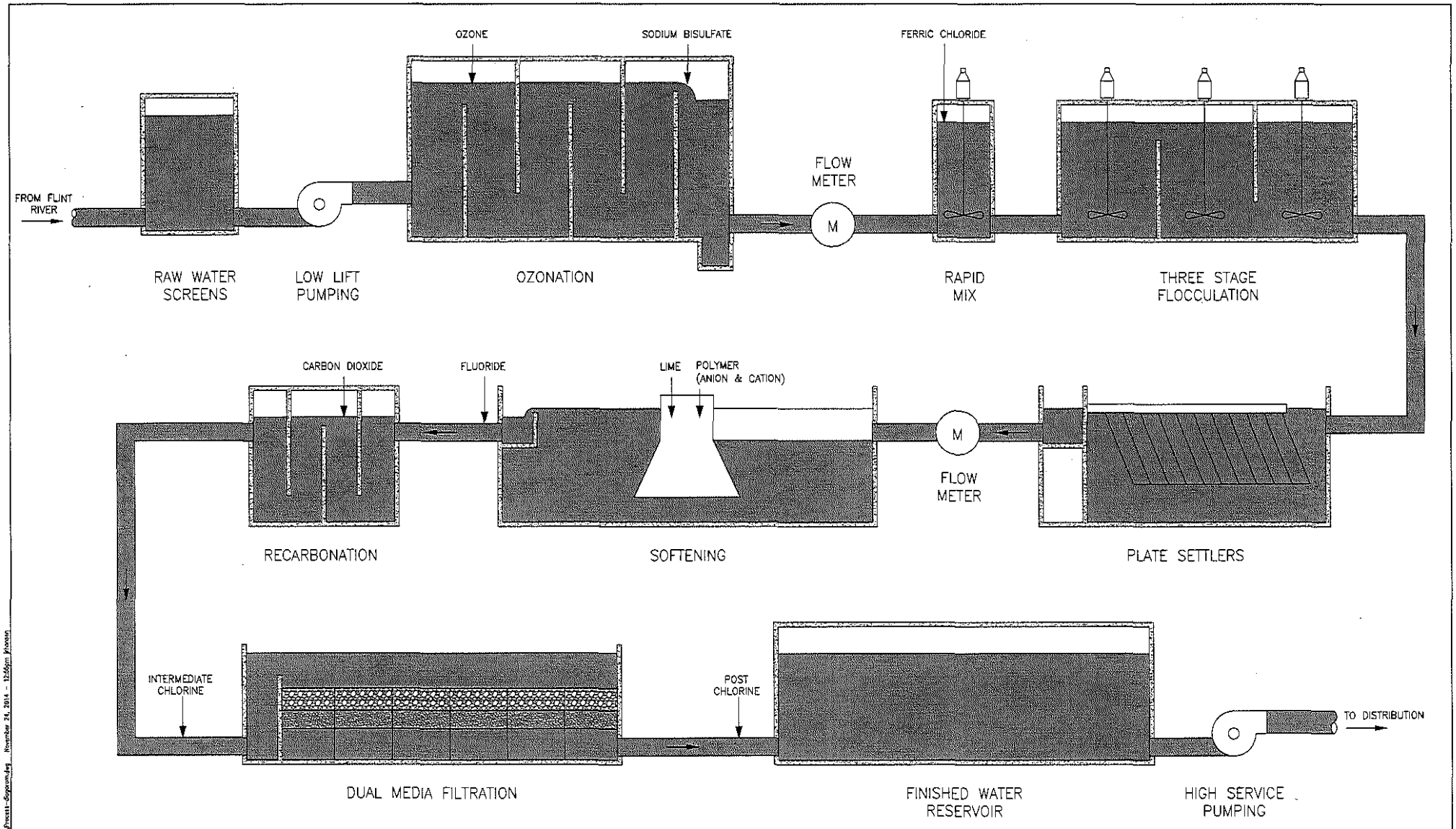
Considering that the Flint River is being used as the water source only until the KWA supply is available (expected late 2016), options to address high THM formation that require new construction or extensive time to implement are not preferred. On the other hand, the City understands THM sample results to date dictate that some action is necessary. Two categories have been developed to assist the City in prioritizing actions to take. Stage 1 consists of actions that can be completed relatively quickly without major construction and Stage 2 actions are either long term actions or solutions requiring major construction. Stage 1 actions are to be completed first followed by evaluation of the results prior to consideration of Stage 2 actions. Grouping of actions are shown in the table below.

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TABLE 6 – ACTION PLAN		
	Action	**Purpose**
Stage 1	Troubleshoot ozone feed system	Reduce chlorine feed and increase TOC removal
	Bench scale jar testing	Optimize treatment process and evaluate possible modifications
	Discontinue softening bypass	Reduce chlorine demand
	Disinfect filters	Reduce chlorine demand
	Increased water main flushing	Reduce water age / stagnant water
	Water system modeling evaluation	Determine areas with high water age and reasons
	Implement coag. & floc. polymer aids, if appropriate	Increase TOC removal
	Modify booster disinfection feeds, if appropriate	Decrease water age
Stage 2	Repair ozone system	Reduce chlorine feed and increase TOC removal
	Continue increased water main flushing	Reduce water age / stagnant water
	Convert to lime and soda ash softening	Increase TOC removal
	Continue valve replacements based on water model	Reduce water age / stagnant water
	Change disinfectant to chlorine dioxide	Reduce THMFP
	Install pre-oxidant feed at intake	Optimize ozone disinfection, reduce chlorine
	Place priority on replacing cast iron water mains	Reduce chlorine demand

Samples were taken the week of November 17th for the 3rd quarter of testing. Although the City has begun implementation of Stage 1 actions, THM results are not expected to be noticeably affected since there has not been enough time for a response. The next quarter of sampling is due to be completed the third week in February. It is the City's intent to implement Stage 1 actions prior to the 3rd quarter of THM sampling.

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Genesee County

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 S. Linden Road, Suite B
Tel 810-820-2682 Fax 810-820-2703
www.lan-inc.com

CITY OF FLINT
WATER TREATMENT PLANT

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

ACTION	BY
Design	
Drawn	
Check	

WATER TREATMENT PLANT
PROCESS DIAGRAM

Project No. 130-10701-001
Date Nov. 21, 2014
Sheet
FIG 1

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, December 08, 2014 1:48 PM
To: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ)
Subject: Flint TTHM letter
Attachments: Flint DBP MCL 4Q14 draft.doc

Adam, Steve

I made some tweaks to the draft letter for consideration and can be tweaked further as needed. Changes are noted in red.....

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

005962

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

[Date]

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, 3rd Quarter of 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). 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. Also, with receipt of the third quarter monitoring results, an Operational Evaluation Level (OEL) was calculated for each of the eight TTHM monitoring locations by adding twice the current quarter's result to the results of the previous two quarters and dividing the total by four. The OEL exceeded the 0.080 mg/l TTHM standard at four of the eight locations.

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). **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.

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.

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 December XX, 2014.

Water systems who exceed the OEL must complete and submit an Operational Evaluation in accordance with Administrative Rule 7191(R325.101791) within 90 days since the start of the violation. The Operational Evaluation must identify possible causes and corrective measures for the elevated TTHM levels. We recently received a draft Operational Evaluation from the city and our review comments will be provided to the city shortly. The Operational Evaluation must be completed and received by our office by no later than March 1, 2015.

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 Assistance
517-290-8817

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

MFP:AR:JR

Enclosures

cc:

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: Rosenthal, Adam (DEQ)
Sent: Monday, December 08, 2014 9:12 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint TTHM MCL letter
Attachments: Flint DBP MCL 4Q14.doc

Attached is the draft. I put the highest LRAA in the letter & have a table attachment that lists all results. Or we can put the table in the letter. Let me know.

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

005966

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

[Date]

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, 3rd Quarter of 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). 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.

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). **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.

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 August 13, 2014, and will continue until TTHM LRAA is below the MCL.

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 September 19, 2014.

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 Assistance
517-290-8817

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

MFP:AR:JR

Enclosures

cc:

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. Testing results from October 1, 2014 to December 31, 2014 show that our system exceeds the standard, or maximum contaminant level (MCL), for trihalomethanes. The standard for trihalomethanes is 80 µg/L. The level of trihalomethanes in our system was determined by averaging all samples collected by our system for the past 12 months. The average level of trihalomethanes in our system was 99 µg/L.

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: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Wednesday, November 12, 2014 4:04 PM
To: Brent Wright (bwright@cityofflint.com); Daugherty Johnson (djohnson@cityofflint.com); hcroft@cityofflint.com; mglasgow@cityofflint.com; Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ); Green, Warren; Matta, Samir
Cc: Nakashima, Jeremy
Subject: Flint TTHM Meeting
Attachments: TTHM-MDEQ-mtg-minutes_11-07-14.pdf

Hi to all,

Meeting minutes are attached. Please let me know if anyone has something to add/modify.

Jeffrey R. Hansen
Senior Project Manager

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 **C** 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

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CITY OF FLINT WTP
TTHM Response Plan Meeting Minutes
Notes from the meeting shown in red, bold font
November 7, 2014 9:30 am

Discussion Topics

I. Introductions

II. Purpose/Overview
WG provided an historical review of Flint WTP since ~1999 through today including design and regulatory concerns. Phase I improvements from 1999-2005 were completed to allow the plant to operate as an emergency back-up to DWSD supply for a moderate time period (4-6 weeks). Phase II improvements are defined as improvements to allow the plant to operate full time, without DWSD supply. The ultimate supply will be Lake Huron water supplied through the KWA system. The Flint River is the current supply until KWA supply is available. A treatability study was completed in 2002 which evaluated full time supply from the Flint River and contains information that is directly relevant to today's operations.

A. KWA supply timing
   1. Expected completion fall 2016
B. TTHM high level samples
C. Levels at multiple sites indicate source / WTP issue
   1. Problem did not exist on Detroit water
   2. 8 sites likely to exceed OEL

III. Suspected Causes
A. Source water
   1. TOC has remained consistent
   2. Turbidity has remained consistent
   3. pH has remained consistent
   4. Increase in total Coliform

Period	Turbidity NTU	TOC Mg/l	Alkalinity Mg/l	Hardness Mg/l	pH	Total Col. Count/day
2001 Apr–Oct	7.9	9.4	215	272	8.1	870-1230 (7300 max)
2014 May–Sept	8.1	10.3 5/22/14	205	250	8.1	1500-5000 (22,398 max)

B. WTP operation
   1. Ozone feed not working properly
   2. Recent increased chlorine feed
   3. Coag or floc polymer aids might not be optimized
C. Distribution problems
   1. Low flow
   2. Dead ends
   3. Too much storage
   4. **City has unlined CI**
   5. **Cedar Street and West Side pump stations do not pump into defined pressure districts and may be recirculating water**

6. **City has been repairing/replacing valves which could be resulting in flow pattern changes**

IV. Operational Evaluation Report Requirements
   A. Distribution system evaluation
      1. Distribution evaluation and modeling by others
      2. Storage capacity evaluation
      3. **The City is considering water model updates and new simulations to evaluate possible improvements**

   B. Source water evaluation
   C. Treatment evaluation
      1. Jar testing
      2. No ozone piloting
      3. Experiment with coag and floc polymer aid dosages
   D. Timing / schedule

Letter from MDEQ states the report is to be submitted by 11/28/14. However, regulations state the public water supply has 90 days from the date of violation to complete the Operational Evaluation Report and Flint has technically not had a violation yet. The next sampling period is the 3rd week of November. SB stated the MDEQ would like to have a draft report by 11/28/14 that would not need to be entirely complete, but this would show a proactive approach by the City.

V. Possible Solutions
   A. Chlorine dioxide or chloramine

LAN believes there is a reasonable chance that chloramine would not be a strong enough disinfectanct but chlorine dioxide warrants further consideration.

   B. Decreased chlorine feed rate

A portion of flow through the WTP was being bypassed around the softening process and it was believed to be contributing to chlorine demand. The City has discontinued the bypass and it appears chlorine demand has dropped by 0.5 – 1.0 mg/l.

   C. pH adjustment
   D. Corrections/modifications to ozone

The City and LAN have looked at the ozone feed system and data suggests there is a problem though the exact issue is yet to be determined. Further investigation is planned as one high priority response.

   E. Coag & floc polymer aids (better TOC removal)

Jar testing is planned as part of the OER during which polymer aids will be further evaluated.

   F. Enhanced TOC removal with softening
   G. UV??? [with chlorine after for residual]
   H. Flushing to decrease water age?

The City is considering increased flushing to address both water age and rusty water.

   I. Lower storage tank high water levels (use less volume)?

VI. Other

- Chlorine demand through the filters is another concern. The City may shock the filters with high chlorine feed in an attempt to 'cleanse' them.
- Addition of flocculation and/or coagulation polymer feeds: MDEQ is open to the idea and would consider a letter submittal from the City listing the details in order to provide approval if the City wants to implement into the WTP process.
- The average flow through the WTP has fallen off from 18-19 mgd over the summer to ~14 mgd at this time.
- A TTHM limit violation is Tier 2 and will require the appropriate public notice.
- The City is currently achieving ~60% TOC removal.
- pH is currently 7.5-8.0 at WTP effluent.
- Costs to reconnect to DWSD supply have become prohibitive as a viable solution: $4 Million start up fee + $900,000 monthly flat fee + usage charges.
-

November 7, 2014

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 C 517.819.2367

Sign-in Sheet
City of Flint TTHM Response
MDEQ Meeting

Date/Time: 11-07-14 @ 9:30 am

Location: LAN Okemos Office

Name	Company	Phone Number	Email
Steve Busch	MDEQ	517-643-2314	buschs@michigan.gov
Michael Prysby	MDEQ	517 290-8817	PrysbyM@michigan.gov
Jeff Hansen	LAN	810-820-2682	jrhansen@lan-inc.com
Pat Cook	DEQ	517-284-6514	cookp@michigan.gov
Daugherty Johnson	Flint	810 577-8906	djohnson@cityofflint.com
Howard Croft	Flint	810 577-1202	hcroft@cityofflint.com
Warren Green	LAN	630-495-4123	jwgreen@lan-inc.com
Mike Glasgow	Flint	810-787-6537	MGLASGOW@CITYOFFLINT.COM
Brent Wright	Flint	810-787-6537	bwright@cityoffl.int.com
SFM	LAN	~~517~~ 517-203-5937	sfmatta@lan-inc.com

Rennaker, Joanne (DEQ)

From: Philip, Kris (DEQ)
Sent: Friday, February 27, 2015 12:24 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: Flint TTHM
Attachments: 02310_Flint_TTHM_02 27 2015.xlsx

Here are Flint's most recent 4 quarters of TTHM data.

WSSN	System	Mon Prd	Collect Date	Site Code	Analyte	Result	Unit	LRAA
02310	FLINT, CITY OF	2Q2012	23-May-12	DBP1	2950	0.032	MG/L	0.008
02310	FLINT, CITY OF	2Q2012	23-May-12	DBP2	2950	0.019	MG/L	0.005
02310	FLINT, CITY OF	2Q2012	23-May-12	DBP3	2950	0.017	MG/L	0.004
02310	FLINT, CITY OF	2Q2012	23-May-12	DBP4	2950	0.02	MG/L	0.005
02310	FLINT, CITY OF	3Q2012	22-Aug-12	DBP1	2950	0.0578	MG/L	0.022
02310	FLINT, CITY OF	3Q2012	22-Aug-12	DBP2	2950	0.0324	MG/L	0.013
02310	FLINT, CITY OF	3Q2012	22-Aug-12	DBP3	2950	0.0365	MG/L	0.013
02310	FLINT, CITY OF	3Q2012	22-Aug-12	DBP4	2950	0.0419	MG/L	0.015
02310	FLINT, CITY OF	4Q2012	20-Nov-12	DBP1	2950	0.0421	MG/L	0.033
02310	FLINT, CITY OF	4Q2012	20-Nov-12	DBP2	2950	0.0152	MG/L	0.017
02310	FLINT, CITY OF	4Q2012	20-Nov-12	DBP3	2950	0.0156	MG/L	0.017
02310	FLINT, CITY OF	4Q2012	20-Nov-12	DBP4	2950	0.0195	MG/L	0.02
02310	FLINT, CITY OF	1Q2013	20-Feb-13	DBP1	2950	0.0438	MG/L	0.044
02310	FLINT, CITY OF	1Q2013	20-Feb-13	DBP2	2950	0.0122	MG/L	0.02
02310	FLINT, CITY OF	1Q2013	20-Feb-13	DBP3	2950	0.0115	MG/L	0.02
02310	FLINT, CITY OF	1Q2013	20-Feb-13	DBP4	2950	0.0127	MG/L	0.024
02310	FLINT, CITY OF	2Q2013	22-May-13	DBP1	2950	0.0312	MG/L	0.044
02310	FLINT, CITY OF	2Q2013	22-May-13	DBP2	2950	0.0155	MG/L	0.019
02310	FLINT, CITY OF	2Q2013	22-May-13	DBP3	2950	0.0157	MG/L	0.02
02310	FLINT, CITY OF	2Q2013	22-May-13	DBP4	2950	0.0175	MG/L	0.023
02310	FLINT, CITY OF	3Q2013	21-Aug-13	DBP1	2950	0.0485	MG/L	0.041
02310	FLINT, CITY OF	3Q2013	21-Aug-13	DBP2	2950	0.0308	MG/L	0.018
02310	FLINT, CITY OF	3Q2013	21-Aug-13	DBP3	2950	0.0288	MG/L	0.018
02310	FLINT, CITY OF	3Q2013	21-Aug-13	DBP4	2950	0.0297	MG/L	0.02
02310	FLINT, CITY OF	4Q2013	20-Nov-13	DBP1	2950	0.0275	MG/L	0.038
02310	FLINT, CITY OF	4Q2013	20-Nov-13	DBP2	2950	0.0172	NG/L	0.015
02310	FLINT, CITY OF	4Q2013	20-Nov-13	DBP3	2950	0.017	MG/L	0.018
02310	FLINT, CITY OF	4Q2013	20-Nov-13	DBP4	2950	0.0191	MG/L	0.02
02310	FLINT, CITY OF	1Q2014	19-Feb-14	DBP1	2950	0.0246	MG/L	0.033
02310	FLINT, CITY OF	1Q2014	19-Feb-14	DBP2	2950	0.0111	MG/L	0.014
02310	FLINT, CITY OF	1Q2014	19-Feb-14	DBP3	2950	0.01	MG/L	0.018
02310	FLINT, CITY OF	1Q2014	19-Feb-14	DBP4	2950	0.0122	MG/L	0.02
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP1	2950	0.1624	MG/L	0.041
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP2	2950	0.1116	MG/L	0.028
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP3	2950	0.0965	MG/L	0.024
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP4	2950	0.1064	MG/L	0.027
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP5	2950	0.0792	MG/L	0.02
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP6	2950	0.0882	MG/L	0.022
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP7	2950	0.0822	MG/L	0.021
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP8	2950	0.0751	MG/L	0.019
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP1	2950	0.1453	MG/L	0.077
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP2	2950	0.1272	MG/L	0.06
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP3	2950	0.1183	MG/L	0.054
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP4	2950	0.1962	MG/L	0.076

02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP5	2950	0.1813	MG/L	0.065
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP6	2950	0.1444	MG/L	0.058
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP7	2950	0.1124	MG/L	0.049
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP8	2950	0.112	MG/L	0.047
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP3	2950	0.0411	MG/L	0.064
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP4	2950	0.0936	MG/L	0.099
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP6	2950	0.0536	MG/L	0.072
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP7	2950	0.0501	MG/L	0.061
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP1	2950	0.0586	MG/L	0.092
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP2	2950	0.0333	MG/L	0.068
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP5	2950	0.0339	MG/L	0.074
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP8	2950	0.0362	MG/L	0.056
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP1	2950	0.0162	MG/L	0.096
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP2	2950	0.0168	MG/L	0.072
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP3	2950	0.0149	MG/L	0.068
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP4	2950	0.0245	MG/L	0.105
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP5	2950	0.0181	MG/L	0.078
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP6	2950	0.0192	MG/L	0.076
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP7	2950	0.0285	MG/L	0.068
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP8	2950	0.0199	MG/L	0.061

Units	ResultsUsed
MG/L	1
MG/L	1
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Flint TTHM Results & LRAA (2/27/2015)

WSSN	System	Mon Prd	Collect Date	Site Code	Analyte	Result	Unit	LRAA	Units	Results Used	
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP1	2950	0.1624	MG/L	0.041	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP1	2950	0.1453	MG/L	0.077	MG/L	2	
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP1	2950	0.0586	MG/L	0.092	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP1	2950	0.0162	MG/L	0.096	MG/L	4	0.096
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP2	2950	0.1116	MG/L	0.028	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP2	2950	0.1272	MG/L	0.06	MG/L	2	
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP2	2950	0.0333	MG/L	0.068	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP2	2950	0.0168	MG/L	0.072	MG/L	4	0.072
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP3	2950	0.0965	MG/L	0.024	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP3	2950	0.1183	MG/L	0.054	MG/L	2	
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP3	2950	0.0411	MG/L	0.064	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP3	2950	0.0149	MG/L	0.068	MG/L	4	0.068
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP4	2950	0.1064	MG/L	0.027	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP4	2950	0.1962	MG/L	0.076	MG/L	2	
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP4	2950	0.0936	MG/L	0.099	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP4	2950	0.0245	MG/L	0.105	MG/L	4	0.105
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP5	2950	0.0792	MG/L	0.02	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP5	2950	0.1813	MG/L	0.065	MG/L	2	
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP5	2950	0.0339	MG/L	0.074	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP5	2950	0.0181	MG/L	0.078	MG/L	4	0.078
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP6	2950	0.0882	MG/L	0.022	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP6	2950	0.1444	MG/L	0.058	MG/L	2	
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP6	2950	0.0536	MG/L	0.072	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP6	2950	0.0192	MG/L	0.076	MG/L	4	0.076
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP7	2950	0.0822	MG/L	0.021	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP7	2950	0.1124	MG/L	0.049	MG/L	2	
02310	FLINT, CITY OF	4Q2014	19-Nov-14	DBP7	2950	0.0501	MG/L	0.061	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP7	2950	0.0285	MG/L	0.068	MG/L	4	0.068
02310	FLINT, CITY OF	2Q2014	21-May-14	DBP8	2950	0.0751	MG/L	0.019	MG/L	1	
02310	FLINT, CITY OF	3Q2014	21-Aug-14	DBP8	2950	0.112	MG/L	0.047	MG/L	2	
02310	FLINT, CITY OF	4Q2014	20-Nov-14	DBP8	2950	0.0362	MG/L	0.056	MG/L	3	
02310	FLINT, CITY OF	1Q2015	17-Feb-15	DBP8	2950	0.0199	MG/L	0.061	MG/L	4	0.061

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, February 20, 2015 11:42 AM
To: Rosenthal, Adam (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Flint TTHMs

I spoke with Brent this morning, the 4th quarter TTHMs were collected Tues and Wed of this week and mailed to the lab. We may results by the end of next week.

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, August 08, 2014 4:45 PM
To: rfelton@metrotimes.com
Cc: Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Shekter Smith, Liane (DEQ)
Subject: Flint Water Discoloration

Ryan,

I was forwarded your inquiry concerning the potential cause(s) of the water discoloration in the College Cultural and downtown areas of Flint. Upon further discussion with water treatment plant staff, the discoloration appears to have been caused by un-authorized drafting of water from fire hydrants in these areas for street sweeping activities. This issue was discussed with the city and the department of public works and this method of obtaining water for street sweeping will be discontinued. Any future activities that involve drafting of water are to coordinated with the Water Service Center and the drafting will occur at specified locations. Also, the presence of cast-iron watermains in or near these areas can also cause discoloration, especially under high flow conditions (main breaks, flushing, and un-authorized hydrant use) as this stirs up of accumulated sediment and rust (typically associated with old cast-iron mains). If you have any further questions, please don't hesitate to contact me at the number provided below.

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

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Tuesday, January 27, 2015 1:30 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint water media calls

I've been instructed to take all media inquiries on this for the foreseeable future. Please alert other staff as necessary. Thanks.
b

Brad Wurfel
Communications Director
Michigan Department of Environmental Quality
517-284-6713
517-230-8006 cell

Rennaker, Joanne (DEQ)

From: Clayton, Stacie (GOV)
Sent: Friday, March 06, 2015 2:05 PM
To: Hollins, Harvey (GOV); 'Gerald Ambrose'; 'Maxine Murray'; Thelen, Mary Beth (DEQ); Wurfel, Brad (DEQ); Devereaux, Tracy Jo (DEQ); Busch, Stephen (DEQ); 'Natasha Henderson'; Shekter Smith, Liane (DEQ)
Subject: Flint Water Meeting
Attachments: SomnioGlobal_Ozone disinfection technology.pdf

Greetings All,

Attached is a brief overview of the information to be presented on Monday at the 1:00pm meeting with Steve Linder of the Sterling Corporation regarding Flint Water. The meeting will be held at the Sterling Corporation's offices on 106 W. Allegan, Ste. 2 in Lansing. I have sent the appointment and here are the list of attendees:

Harvey Hollins, Director, Governor's Office of Urban and Metropolitan Initiatives
Gerald Ambrose, Flint Emergency Manager
Natasha Henderson, Flint, City Manager
Liane Shekter Smith, Chief, Office of Drinking Water and Municipal Assistance (DEQ)
Stephen Busch, Office of Drinking Water and Municipal Assistance (DEQ)
Brad Wurfel, Director of Communications (DEQ)

Please let me know if you have any questions, thank you.

Stacie

Stacie Clayton, Assistant Director
Harvey Hollins III, Director
Governor's Office of Urban and Metropolitan Initiatives
3044 West Grand Boulevard, Ste. 14-650
Detroit, MI 48202
313.456.4994 (office)
claytons3@michigan.gov

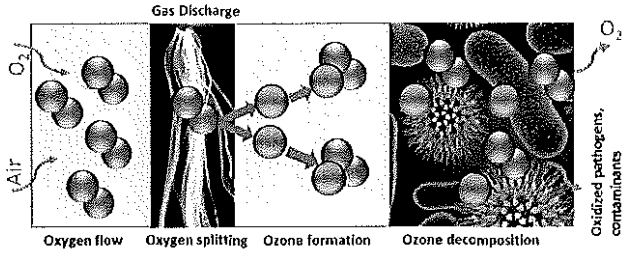
SOMNIO GLOBAL

Air_2O_3

Chemical Free Water Disinfection by Ozone

Today about 98% of water treatment facilities in the U.S. use some form of chlorine to disinfect drinking water supplies. It is a cost effective method for destroying potentially harmful bacteria and viruses. However, chlorine's ability to interact with organic compounds in water leads to trihalomethanes (THMs) formation. Especially, river or lake water with high level of organic matter require heavy chlorination to combat high level of bacteria, resulting in dangerous levels of THMs and bad smell. THMs, when ingested can encourage the growth of free radicals that can destroy or damage vital cells in the body. Besides cancer, exposure to THMs has been linked to other health issues including asthma, eczema, heart disease and higher miscarriage and birth defect rates. Further, high level of chlorine also poses serious risk to the aging infrastructure.

Chemical free water disinfection technologies such as UV light and ozone have long been recognized to be much safer than chlorination, however, their high cost has prevented wider adoption. The basic mechanism of ozone generation and disinfection is shown in the picture. Ozone has a high oxidation potential (much higher than chlorine) and a superior response time compared to other sanitizing products. Its high oxidizing potential enables ozone to break down organic matters that chlorine cannot. Some pollutants can only be oxidized by ozone. For example, ***Cryptosporidium Parvum***, a drinking water pollutant, is resistant to most disinfectants, but is effectively destroyed by ozone. Most importantly, the emission from ozone is pure oxygen and it leaves no residues.



UV light is a competing non-chemical sterilization technique. Intense UV rays break down the sensitive RNA and/or DNA of microorganisms, thus preventing the organism from reproducing. Ozone, on the other hand, oxidizes the microorganisms, thus destroying their cells completely. UV sterilization being a line of sight process, to be effective, one needs to remove most of the suspended matter prior to the treatment. In contrast, ozone oxidizes the soil or particulate matter, changing or destroying the chemistry of the soiling materials such as organic compounds.

Despite the great benefits of ozone, its widespread adoption is limited due to the high total ownership cost of current commercial ozone generators. Somnio's $AiR_2O_3^{TM}$ ozone generator is a paradigm shift in ozone generation technology. The first and only commercial barrier less ozone generator eliminates the requirement of dielectric barriers and highly filtered dried oxygen (pure or enriched) supplies, which restrain current commercial ozone generators. This groundbreaking technology brings a market-competitive, robust, energy efficient, and scalable modular device that offers a financially attractive alternative with the capability of producing varying levels of ozone depending on the application at hand.

Producing ozone cost effectively is only part of the greater story of the far reaching benefits of ozone. Applying ozone effectively for a given application requires careful and intelligent design, sensing and monitoring. In addition to its revolutionary $AiR_2O_3^{TM}$ ozone generator, Somnio

collaborates with end users to provide complete and economical turnkey solutions. Somnio's current in-house test plant incorporates all necessary safety features and automation.

Rennaker, Joanne (DEQ)

From: Brent Wright <bwright@cityofflint.com>
Sent: Tuesday, June 25, 2013 7:58 AM
To: Ashford, Stephen (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Daugherty Johnson; Dave Jansen; Howard Croft; John O'Malia; John O'Brien; Hansen, Jeff; Green, Warren; Michael Glasgow; Samir Matta
Subject: Flint Water Plant Meeting Reminder
Attachments: Flint WTP Mtg Agenda 6-26-13.doc

Gentlemen just a reminder of the scheduled 9 am meeting tomorrow at the Flint Water. A meeting agenda is attached. Have a great day.

Thank You,
Brent Wright

FLINT WTP FACILITY MEETING AGENDA

June 26, 2013 9:00 am

Discussion Topics

I. Introductions

II. Progress Update
- A. Regulatory Needs for Interim & Long Term Operation
- B. Scheduled Plant Run
- C. Timing
- D. Softening/Sludge Disposal

III. Existing WTP Facility Anticipated Improvements
- A. Plant Capacity/Hydraulics
- B. Short Term Goal-Flint River
- C. Long Term Goal-KWA
- D. Project Costs/Budgets
  1. City
     - a) Test Run Mode
     - b) Flint River
     - c) KWA
  2. County
     - a) Test Run Mode
     - b) Flint River
     - c) KWA

IV. Operational Considerations
- A. Job Duties
- B. Work Sharing
- C. Operational/Product/Utility Costs

V. Other Issues

VI. Meeting Schedule

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, October 02, 2015 1:33 PM
To: Busch, Stephen (DEQ)
Subject: Flint WQPs

Flint monitors 25 locations quarterly in the distribution system for the following WQPs:

Temperature, Conductivity, pH, Total Alkalinity, and Calcium

Rennaker, Joanne (DEQ)

From:	Prysby, Mike (DEQ)
Sent:	Thursday, April 03, 2014 9:57 AM
To:	sfmatta@lan-inc.com
Cc:	Busch, Stephen (DEQ)
Subject:	Flint WTP - Bray Road Lagoon Proposal - MDEQ comments
Attachments:	Pre-lim Eng Reports - DEQ Comments III April 2, 2014.doc

Samir,

Attached are our comments pertaining to submittals received for Phase II – Segments I and II for the Flint WTP. If you have any questions concerning our comments, I will be available till close of business today to discuss with you. After today, you will need to contact Steve Busch concerning any questions regarding the Flint WTP project. I will return from vacation on Monday April 21st.

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

Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
April 3, 2014

Phase II – Segment 1 - Watermain Cut-in Plans

- Mid-Pt Chlorination - update plans to depict the additional anti-siphon/ball valve as described in your response to our March 19, 2014 comments. Most likely to be added to Sheet C-508.

- Include a full-sized mid-point chlorination system schematic with the updated plans.

- It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.

Please provide 2 full-sized sets of Watermain Cut-in Plans that include the requested information and revisions.

Phase II - Segment 1 - WTP Rehabilitation Plans

- LOX/LN Storage & Piping – update plans to depict revised sheets D2-102 and D2-601. The revisions were made to clarify the gas piping configuration.

- The existing LOX storage tank will provide approximately 16 days storage at max design rate at 12.0 MGD until the second tank is installed. The Act 399 permit will be issued with a condition that the MDEQ is provided a copy of the contract between the city and the LOX supplier that specifies the maximum delivery time. The LOX system shall be operated such that a minimum of 5 days

storage is maintained in the LOX tank at all times.

- Mid – Point Chlorination (Chlorine room) - revise sheets C5-105 and C5-508 to show deletion of the chlorine gas scrubber system.

- Revise the ventilation intake duct detail (Sheet C5-508) to as described in your response.

- Add panic hardware to chlorinator room door (east and west exits).

- The existing door between P.S. 4 and the chlorine gas storage room should be closed off such that the chlorine gas storage room and chlorinator room are only assessable from the outside. Although an improved door sweep is proposed, door sweeps are not failsafe in a catastrophic gas release and such an event could jeopardize the entire P.S. #4.

- Raw Water Piping – the proposed 54X42 cross provides minimal vertical separation (approximately 6-inches). A pair concrete cradles installed on each side of the 54-inch concrete main will mitigate the force of the 42-inch main installed above at the crossing. A condition will be added to the Act 399 permit to field adjust the 42-inch main installation to maximize the vertical separation at the crossing.

Please provide 2 full-sized sets of WTP Rehabilitation Plans that include the requested information and revisions.

Phase II – Segment 2 - Bray Road Sludge Lagoon

Provide 2 full-sized sets of construction plans for proposed work at the Bray Road sludge lagoon. Separation between the concrete disposal area the lime sludge disposal area by metal sheet piling, as discussed in our meeting, needs to be depicted.

Prepare final Bray Road Lime Sludge Management Plan. The plan also needs to include establishment of a level working surface in the west portion of the lagoon and removal of the island.

The Act 399 permit will also include a condition requiring the sheet piling to be driven deep enough into native soil to maintain its structural integrity for removal of waste material on the exterior portion of the lagoon.

Act 399 Permit Applications:

WTP Rehabilitation:

Part 6 (Facilities Description) needs to discuss the provisions for the stand-by generator. The description needs to be added in the Phase II – Segment III – Electrical Improvements (@WTP) – (i.e. transfer switch, universal generator connection)

Bray Road (Flint WTP Phase II, Segment II – Lime Residual Disposal)

Please revise Part 6 (Facilities Description) since a berm-liner system will not be used to separate the lime sludge area from the concrete debris area. Eliminate "Berm/liner" from the statement: "Berm/liner or Sheet Piling improvements to separate concrete debris from lime sludge."

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, July 17, 2013 9:11 AM
To: Busch, Stephen (DEQ)
Subject: Flint WTP - Test Run Status

Steve,

I spoke with Brent late yesterday and the Flint WTP has not yet started the softening process. They are awaiting delivery of CO2 for the re-carb system. The CO2 supplier is available to deliver the product; however, the CO2 storage tank must be inspected prior to re-filling....According to Brent's discussion with the supplier, the inspection is expected to be completed by this afternoon (the latest). The CO2 would then be delivered within an hour or two after the inspection. Once the CO2 is delivered, the WTP will temporarily shut down to backwash their first 5 filters – these were shut down last Saturday (they are currently using their second set of five). Immediately after the WTP resumes operation following backwash, WTP staff will start the softening process.

I will contact Brent later today to see where they are at. I also gave him a "heads-up" on our visit for next Tues – mid to late morning. That works well for him and his staff. I will also ask Brent if he has heard anything from the city as to whether they are considering distributing treated water to the distribution system.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, September 09, 2013 12:03 PM
To: Cook, Pat (DEQ); Busch, Stephen (DEQ)
Subject: Flint WTP CT
Attachments: CT Calc at 18 MGD w. softening.xls

Pat, Steve....
Attached is the revised CT calc using 3-log removal for giardia as the starting point for the CT calc. The assumptions made were; 18 MGD, 0.1 ppm CL2 in the contact units and filters, 1.0 ppm CL2 in clearwell, 0.5 deg C, pH 9.0. The disinfection process provides an additional 0.57 log removal which exceeds the 0.5 log removal required for a conventional WTP. I will tweak the calc further based on actual operating levels in the clearwell after tomorrow's softening class at the WTP. Thanks for your input on this!

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

Flint WTP CT Calculation

Assumptions; softening - pH 9.0, 0.5 deg C, 18.0 MGD

1. Ozone: @ 12 MGD per contacter train

		HRT	T10	O3 Conc.	CT
Diffusion Chamber Cell 1	Counter Current	0.72 min	0.36 min		
Diffusion Chamber Cell 2	Co-Current	0.72 min	0.36 min		
Contact Chamber 1		1.76 min	0.88 min		
Contact Chamber 2		3.22 min	1.61 min		
Contact Chamber 3		3.22 min	1.61 min		
Contact Chamber 4		3.22 min	1.61 min		
Contact Chamber 5		3.22 min	1.61 min		
Contact Chamber 6		2.48 min	1.24 min		

3 ozone monitoring points: end of diffusion cell 2, end of chamber 3, end of chamber 6

Ozone concentrations are as follows: Diff Cell 1 - 0.15 mg/l - dectable residuals are not maintained through Chambers #3 and 6; thus they cannot be used in the CT dtm.

Dosage Diffusion Chamber Cell 1: Counter - Current Flow

Cell 1 cannot be credited CT since the ozone concentration is not measured at the exit point of Cell 1 prior to the second ozone diffuser in Cell #2.

$C = C_{out} = 0.00$ mg/l
$C_T = C \times T_{10}$
$C_T = 0.0$ mg/l X 0.36 min = 0.000 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/2.9 min-mg/l = 0.00
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.00 = **0.0**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/1.8 min-mg/l = 0.00
Virus Inactivation: 4 X inactivation ratio or 4 X 0.00 = **0.0**

Dosage Diffusion Chamber Cell 2: Co - Current Flow

$C = (C_{out} + C_{in})/2$
C = (0.15 mg/l + 0.00 mg/l)/2 = 0.075 mg/l

$C_{T\ calc} = CXT$ = 0.075 mg/l X 0.36 min = 0.027 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.027 min-mg/l/2.9 min-mg/l = **0.0093**
Inactivation Ratio (vir): $C_{T\ calc}/C_{T\ 99.99}$ = 0.027 min-mg/l/1.8 min-mg/l = **0.015**

Six Ozone Contact Chambers:
Six Ozone Contact Chambers:
No credit given since ozone residual cannot be maintained consistantly through the contact chambers.

2. **Intermediate Chlorination: Intermediate CL2 added at plate settler effluent**
Assume 10 MGD thru West Unit and 8 MGD thru East Unit with 0.1 mg/l CL2 exiting each unit.

Lime softening solids contact unit detention times:

East unit: 230 min @ 8 MGD
West unit: 184 min @ 10 MGD

Assume baffle factor of 0.5 and use east basin for CT calc.

T10 east = 230min X 0.5 = 115 min
T10 west = 184min X 0.5 = 92 min

Assume pH 9.0, Temp 0.5 C, lowest CL2 on MOR - 0.1 mg/l

CT east = 0.1 mg/l X 115 min = 11.5 min-mg/l
CT west = 0.1 mg/l X 92 min = 9.2 min-mg/l (use lower CT)

CT needed for 3.0 log removal giardia (pH 9.0, 0.5 C, CL2 < 0.4) = 390 min-mg/l
CT needed for 4 log virus removal is 12 min-mg/l

Giardia inactiviation ratio:

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 9.2 min-mg/l/390 min-mg/l = **0.024 min-mg/l**
Inactivation Ratio (vir): $C_{T\ calc}/C_{T\ 99.99}$ = 9.2 min-mg/l/ 12 min-mg/l = **0.77 min-mg/l**

3. **CT Credit through Filtration: 12 filters total at 3.0 MGD each**

Water depth above filter - 7.92 ft

Volume: 700 sqft X (7.92 ft) = 5,544 Cuft or 41,469 gallons

DT= 41,469 gal/3,000,000 gpd = 19.9 min

Assume BF of 1.0, thus T10 = 1.0X19.9 min = 19.9 min

CT = 0.1 mg/l X 19.9 min = 1.99 min-mg/l

CT needed for 3.0 log removal giardia (0.5 deg, pH 9.0, CL2 <0.4) = 390 min-mg
CT needed for 4 log removal virus = 12 min-mg/l

Inactiviation ratio; 1.99 min-mg/l/390 min-mg/l = **0.005**
Inactiviation ratio (vir); 1.99 min-mg/l/12 min-mg/l = **0.17**

2. Post Chlorination:

The Flint WTP can add chlorine to their 3 MGAL well during emergency operation. The following calculation is based upon a flow rate of 18 MGD and using a reservoir baffling factor of 0.28. Since the chlorine demand is used up during intermediate chlorination, a chlorine residual of no less than 1.0 mg/l in the clearwell (after post chlorination) is needed. For the purpose of the CT calculation, a 1.0 mg/l free chlorine residual is used.

Assume: 0.5 deg C, pH 9.0 - softened, 1.0 mg/l CL2

Detention Time (D_T) = 3,000,000 Gal/18,000,000 GPD = 0.167 days or 240 minutes

T10 = 240 min X BF.....BF = 0.28 from CL2 analyzer test

T10 = 240min X 0.28 = 67.2 min

C_T = CL2 X T10 = 1.0 mg/l X 67.2 min = 67.2 min-mg/l

CT needed for 3.0 log removal giardia (0.5 deg, pH 9.0, CL2 1.0 mg/l) = 437 min
C_T needed for 4 - Log removal of virus @ 0.5 deg. C is 12 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 67.2 min-mg/l/437 min-mg/l = **0.154**
Inactivation Ratio (vir): $C_{T\ calc}/C_{T\ 99.99}$ = 67.2 min-mg/l/ 12min-mg/l = **5.6**

3. Total Process:

Total inactivation: = Summation of (O3 + int. CL2 contact units & fliters + clearwell)

= 0.0093 + 0.024 + 0.005 + 0.154 = 0.192

Total Giardia log inactivation = 3X total inactivation

4. Conclusion: FALSE

= 3 X 0.192 = 0.576

FALSE

the Flint WTP is credited with 2.5 log removal; thus, an additional 0.5 log inactivation is needed.Based on the total log inactivation provided, the 0.5 additional log inactivation is met.

Rennaker, Joanne (DEQ)

From:	Prysby, Mike (DEQ)
Sent:	Wednesday, August 28, 2013 11:30 AM
To:	Cook, Pat (DEQ); Busch, Stephen (DEQ)
Subject:	Flint WTP CT
Attachments:	CT Calc.xls; CT Calc at 18 MGD w. softening.xls; CT Calc at 18 MGD.xls

Attached is the Flint WTP CT calculation for several different operating scenarios with worst case meaning cold water – 0.5 deg C.

1. 12 MGD (0.5 C, pH 7.5, final CL 1.0 ppm)
2. 18 MGD (0.5 C, pH 7.5, final CL2 1.5 ppm)
3. 18 MGD w. softening (0.5 C, pH, final CL2 2.5 ppm)

Based on the higher pH, a minimum free residual of 2.5 mg/l from the clearwell appears necessary to meet the required CT in the third scenario.

I also ran the CT calc for the 3 MGAL clearwell at 2 deg C using the regression method. I will place a hard copy of the calc on your desk since my computer not mapped to the scanner on the printer....

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

Flint WTP CT Calculation

1. Ozone: @ 12 MGD per contacter train

		HRT	T10	O3 Conc.	CT
Diffusion Chamber Cell 1	Counter Current	0.72 min	0.36 min		
Diffusion Chamber Cell 2	Co-Current	0.72 min	0.36 min		
Contact Chamber 1		1.76 min	0.88 min		
Contact Chamber 2		3.22 min	1.61 min		
Contact Chamber 3		3.22 min	1.61 min		
Contact Chamber 4		3.22 min	1.61 min		
Contact Chamber 5		3.22 min	1.61 min		
Contact Chamber 6		2.48 min	1.24 min		

3 ozone monitoring points: end of diffusion cell 2, end of chamber 3, end of chamber 6

Ozone concentrations are as follows: Diff Cell 1 - 0.15 mg/l - dectable residuals are not maintained through Chambers #3 and 6; thus they cannot be used in the CT dtm.

Dosage Diffusion Chamber Cell 1: Counter - Current Flow

Cell 1 cannot be credited CT since the ozone concentration is not measured at the exit point of Cell 1 prior to the second ozone diffuser in Cell #2.

$C = C_{out} = 0.00$ mg/l
$C_T = C \times T_{10}$
$C_T = 0.0$ mg/l X 0.36 min = 0.000 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/2.9 min-mg/l = 0.00
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.00 = **0.0**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/1.8 min-mg/l = 0.00
Virus Inactivation: 4 X inactivation ratio or 4 X 0.00 = **0.0**

Dosage Diffusion Chamber Cell 2: Co - Current Flow

$C = (C_{out} + C_{in})/2$
C = (0.15 mg/l + 0.00 mg/l)/2 = 0.075 mg/l

$C_{T\ calc} = CXT$ = 0.075 mg/l X 0.36 min = 0.027 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l

C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.027 min-mg/l/2.9 min-mg/l = 0.0093
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.0093 = **0.028**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 0.027 min-mg/l/1.8 min-mg/l = 0.015
Virus Inactivation: 4 X inactivation ratio or 4 X 0.015 = **0.06**

Six Ozone Contact Chambers:

Six Ozone Contact Chambers:

No credit given since ozone residual cannot be maintained consistantly through the contact chambers.

Total giardia inactivation (Ozone process) = 0.028 log removal

2. Intermediate Chlorination: Intermediate CL2 added at plate settler effluent

Lime softening solids contact unit detention times:

East unit: 114 min @ 19 MGD
West unit: 118 min @ 17 MGD

Assume baffle factor of 0.5 and use east basin for CT calc.

T10 = 114min X 0.5 = 57 min

Assume pH 7.5, Temp 0.5 C, lowest CL2 on MOR - 0.1 mg/l

CT = 0.1 mg/l X 57 min = 5.7 min-mg/l

CT needed for 0.5 log removal giardia (pH 7.5, 0.5 C, CL2 < 0.4) = 40 min-mg/l
CT needed for 2 log virus removal is 6 min-mg/l

Giardia inactiviation ratio:

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 5.7 min-mg/l/40 min-mg/l = 0.143 min-mg/l
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 0.143 = **0.072 min-mg/l**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 5.7 min-mg/l/ 6min-mg/l = 0.95
Virus Inactivation: 2 X inactivation ratio or 2 X 0.95 = 1.9

Total giardia inactiviation (contact unit): 0.072 min-mg/l

3. CT Credit through Filtration: 12 filters total at 3.0 MGD each

Water depth above filter - 7.92 ft, media thickness - 2.5 ft.

Volume: 700 sqft X (7.92 ft + 2.5ft) = 7,244 Cuft or 54,559 gallons

DT= 54,577 gal/3,000,000 gpd = 26.2 min

Assume BF of 0.7, thus T10 = 0.7X26.2 min = 18.3 min

CT = 0.1 mg/l X 18.3 min = 1.83 min-mg/l

CT needed for 0.5 log removal giardia (0.5 deg, pH 7.5, CL2 <0.4) = 40 min-mg/l
CT needed for 2 log removal virus = 6 min-mg/l

Giardia inactiviation ratio; 1.83 min-mg/l/40 min-mg/l = 0.046
Giardia inactiviation ; 0.5 X 0.046 = 0.023

Virus inactiviation ration; 1.83 min-mg/l/6 min-mg/l = 0.31
Virus inactiviation ; 2.0 X 0.31 = 0.62

Total giardia inactiviation (filters): 0.023 min-mg/l

2. Post Chlorination:

The Flint WTP can add chlorine to their 3 MGAL well during emergency operation. The following calculation is based upon a flow rate of 12 MGD and using a reservoir baffling factor of 0.3. Since the chlorine demand is used up during intermediate chlorination, a chlorine residual of no less than 1.0 mg/l in the clearwell (after post chlorination) is easily attainable. For the purpose of the CT calculation, a 1.0 mg/l free chlorine residual is used.

Assume: 0.5 deg C, pH 7.5 - unsoftened, 1.0 mg/l CL2

Detention Time (D_T) = 3,000,000 Gal/13,000,000 GPD = 0.25 days or 360 minutes

T10 (based on CL2 analyzer test) was 120 min on first test and 100 minutes on 2nd test.

Baffle factor = T_{10}/D_T = 100/360 = 0.28

C_T = CL2 X 0.3(D_T) = 1.0 mg/l X 0.28(360 minutes) = 100 min-mg/l

C_T needed for 1/2 - Log removal of giardia @ 0.5 deg. C is 42 min - mg/l
C_T needed for 2 - Log removal of virus @ 0.5 deg. C is 6 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 100 min-mg/l/42 min-mg/l = 2.38
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 2.38 = **1.19**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 100 min-mg/l/ 6min-mg/l = 16.7
Virus Inactivation: 2 X inactivation ratio or 2 X 16.7 = **33.4**

Total giardia inactivation = 1.19 log removal
Total virus inactivation = 33.4 log removal

3. Total Process:

Total giardia inact. = log removal (O3 + int. CL2 contact units & fliters + clearwell)

= 0.028 + 0.072 + 0.023 + 1.19 = 1.31 Log removal

Total virus inact, = log removal (O3 + CL2 in contact units & filters + clearwell)

= 0.06 + 1.9 + 0.62 + 33.4 = 36 Log removal

4. Conclusion:

Based upon the available treatment, assumptions, and calculations above, the Flint WTP can provide adequate CT at a treatment rate of 12.0 MGD with a free chlorine residual of 1.0 mg/l at the clearwell exit.

Flint WTP CT Calculation

Assumptions; softening - pH 9.0, 0.5 deg C, 18.0 MGD

1. Ozone: @ 12 MGD per contacter train

		HRT	T10	O3 Conc.	CT
Diffusion Chamber Cell 1	Counter Current	0.72 min	0.36 min		
Diffusion Chamber Cell 2	Co-Current	0.72 min	0.36 min		
Contact Chamber 1		1.76 min	0.88 min		
Contact Chamber 2		3.22 min	1.61 min		
Contact Chamber 3		3.22 min	1.61 min		
Contact Chamber 4		3.22 min	1.61 min		
Contact Chamber 5		3.22 min	1.61 min		
Contact Chamber 6		2.48 min	1.24 min		

3 ozone monitoring points: end of diffusion cell 2, end of chamber 3, end of chamber 6

Ozone concentrations are as follows: Diff Cell 1 - 0.15 mg/l - dectable residuals are not maintained through Chambers #3 and 6; thus they cannot be used in the CT dtm.

Dosage Diffusion Chamber Cell 1: Counter - Current Flow

Cell 1 cannot be credited CT since the ozone concentration is not measured at the exit point of Cell 1 prior to the second ozone diffuser in Cell #2.

$C = C_{out} = 0.00$ mg/l
$C_T = C \times T_{10}$
$C_T = 0.0$ mg/l X 0.36 min = 0.000 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/2.9 min-mg/l = 0.00
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.00 = **0.0**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/1.8 min-mg/l = 0.00
Virus Inactivation: 4 X inactivation ratio or 4 X 0.00 = **0.0**

Dosage Diffusion Chamber Cell 2: Co - Current Flow

$C = (C_{out} + C_{in})/2$
C = (0.15 mg/l + 0.00 mg/l)/2 = 0.075 mg/l

$C_{T\ calc} = CXT$ = 0.075 mg/l X 0.36 min = 0.027 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.027 min-mg/l/2.9 min-mg/l = 0.0093
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.0093 = **0.028**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 0.027 min-mg/l/1.8 min-mg/l = 0.015
Virus Inactivation: 4 X inactivation ratio or 4 X 0.015 = **0.06**

Six Ozone Contact Chambers:
Six Ozone Contact Chambers:
No credit given since ozone residual cannot be maintained consistantly through the contact chambers.

Total giardia inactivation (Ozone process) = 0.028 log removal

2. Intermediate Chlorination: Intermediate CL2 added at plate settler effluent

Lime softening solids contact unit detention times:

East unit: 114 min @ 19 MGD
West unit: 118 min @ 17 MGD

Assume baffle factor of 0.5 and use east basin for CT calc.

T10 = 114min X 0.5 = 57 min

Assume pH 9.0, Temp 0.5 C, lowest CL2 on MOR - 0.1 mg/l

CT = 0.1 mg/l X 57 min = 5.7 min-mg/l

CT needed for 0.5 log removal giardia (pH 9.0, 0.5 C, CL2 < 0.4) = 65 min-mg/l
CT needed for 2 log virus removal is 6 min-mg/l

Giardia inactiviation ratio:

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 5.7 min-mg/l/65 min-mg/l = **0.088 min-mg/l**
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 0.088 = **0.044 min-mg/l**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 5.7 min-mg/l/ 6min-mg/l = 0.95
Virus Inactivation: 2 X inactivation ratio or 2 X 0.95 = 1.9

Total giardia inactiviation (contact unit): 0.044 min-mg/l

3. CT Credit through Filtration: 12 filters total at 3.0 MGD each

Water depth above filter - 7.92 ft, media thickness - 2.5 ft.

Volume: 700 sqft X (7.92 ft + 2.5ft) = 7,244 Cuft or 54,559 gallons

DT= 54,577 gal/3,000,000 gpd = 26.2 min

Assume BF of 0.7, thus T10 = 0.7X26.2 min = 18.3 min

CT = 0.1 mg/l X 18.3 min = **1**.83 min-mg/l

CT needed for 0.5 log removal giardia (0.5 deg, pH 9.0, CL2 <0.4) = 65 min-mg/l
CT needed for 2 log removal virus = 6 min-mg/l

Giardia inactiviation ratio; 1.83 min-mg/l/65 min-mg/l = **0.028**
Giardia inactiviation ; 0.5 X 0.046 = 0**.014**

Virus inactiviation ration; 1.83 min-mg/l/6 min-mg/l = **0.31**
Virus inactiviation ; 2.0 X 0.31 = **0.62**

Total giardia inactiviation (filters): 0.014 min-mg/l

2. Post Chlorination:

The Flint WTP can add chlorine to their 3 MGAL well during emergency operation. The following calculation is based upon a flow rate of 18 MGD and using a reservoir baffling factor of 0.28. Since the chlorine demand is used up during intermediate chlorination, a chlorine residual of no less than 2.5 mg/l in the clearwell (after post chlorination) is needed. For the purpose of the CT calculation, a 2.5 mg/l free chlorine residual is used.

Assume: 0.5 deg C, pH 9.0 - softened, 2.5 mg/l CL2

Detention Time (D_T) = 3,000,000 Gal/18,000,000 GPD = 0.167 days or 240 minutes

T10 = 240 min X BF.....BF = 0.28 from CL2 analyzer test

T10 = 240min X 0.28 = 67.2 min

C_T = CL2 X T10 = 2.5 mg/l X 67.2 min = 168.0 min-mg/l

CT needed for 0.5 log removal giardia (0.5 deg, pH 9.0, CL2 2.5 mg/l) = 88 min-mg/
C_T needed for 2 - Log removal of virus @ 0.5 deg. C is 6 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 168 min-mg/l/88 min-mg/l = **1.91**
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 1.91 = **0.95**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 100.8 min-mg/l/ 6min-mg/l = **16.8**
Virus Inactivation: 2 X inactivation ratio or 2 X 16.7 = **33.6**

Total giardia log inactivation = 0.95
Total virus log inactivation = 33.6

3. Total Process:

Total giardia log inact. = log removal (O3 + int. CL2 contact units & fliters + clearwell)

Total Giardia log Inactivation = 0.028 + 0.044 + 0.014 + 0.81 = 1.04

Total virus log inact. = (O3 + CL2 in contact units & filters + clearwell)

= 0.06 + 1.9 + 0.62 + 33.6 = 36.2

4. Conclusion:

Based upon the available treatment, assumptions, and calculations above, the Flint WTP can provide adequate CT at a treatment rate of 18 MGD provided that a free chlorine residual of 2.5 mg/l at the clearwell exit can be maintained.

Flint WTP CT Calculation

1. Ozone: @ 12 MGD per contacter train

		HRT	T10	O3 Conc.	CT
Diffusion Chamber Cell 1	Counter Current	0.72 min	0.36 min		
Diffusion Chamber Cell 2	Co-Current	0.72 min	0.36 min		
Contact Chamber 1		1.76 min	0.88 min		
Contact Chamber 2		3.22 min	1.61 min		
Contact Chamber 3		3.22 min	1.61 min		
Contact Chamber 4		3.22 min	1.61 min		
Contact Chamber 5		3.22 min	1.61 min		
Contact Chamber 6		2.48 min	1.24 min		

3 ozone monitoring points: end of diffusion cell 2, end of chamber 3, end of chamber 6

Ozone concentrations are as follows: Diff Cell 1 - 0.15 mg/l - dectable residuals are not maintained through Chambers #3 and 6; thus they cannot be used in the CT dtm.

Dosage Diffusion Chamber Cell 1: Counter - Current Flow

Cell 1 cannot be credited CT since the ozone concentration is not measured at the exit point of Cell 1 prior to the second ozone diffuser in Cell #2.

$C = C_{out} = 0.00$ mg/l
$C_T = C \times T_{10}$
$C_T = 0.0$ mg/l X 0.36 min = 0.000 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l
C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/2.9 min-mg/l = 0.00
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.00 = **0.0**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.000 min-mg/l/1.8 min-mg/l = 0.00
Virus Inactivation: 4 X inactivation ratio or 4 X 0.00 = **0.0**

Dosage Diffusion Chamber Cell 2: Co - Current Flow

$C = (C_{out} + C_{in})/2$
C = (0.15 mg/l + 0.00 mg/l)/2 = 0.075 mg/l

$C_{T\ calc} = CXT$ = 0.075 mg/l X 0.36 min = 0.027 min - mg/l

C_T needed for 3 - Log removal of giardia @ 0.5 deg. C - 2.9 min - mg/l

C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 0.027 min-mg/l/2.9 min-mg/l = 0.0093
Giardia Inactivation: 3 X inactivation ratio or 3 X 0.0093 = **0.028**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 0.027 min-mg/l/1.8 min-mg/l = 0.015
Virus Inactivation: 4 X inactivation ratio or 4 X 0.015 = **0.06**

Six Ozone Contact Chambers:

Six Ozone Contact Chambers:

No credit given since ozone residual cannot be maintained consistantly through the contact chambers.

Total giardia inactivation (Ozone process) = 0.028 log removal

2. Intermediate Chlorination: Intermediate CL2 added at plate settler effluent

Lime softening solids contact unit detention times:

East unit: 114 min @ 19 MGD
West unit: 118 min @ 17 MGD

Assume baffle factor of 0.5 and use east basin for CT calc.

T10 = 114min X 0.5 = 57 min

Assume pH 7.5, Temp 0.5 C, lowest CL2 on MOR - 0.1 mg/l

CT = 0.1 mg/l X 57 min = 5.7 min-mg/l

CT needed for 0.5 log removal giardia (pH 7.5, 0.5 C, CL2 < 0.4) = 40 min-mg/l
CT needed for 2 log virus removal is 6 min-mg/l

Giardia inactiviation ratio:

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 5.7 min-mg/l/40 min-mg/l = 0.143 min-mg/l
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 0.143 = **0.072 min-mg/l**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 5.7 min-mg/l/ 6min-mg/l = 0.95
Virus Inactivation: 2 X inactivation ratio or 2 X 0.95 = 1.9

Total giardia inactiviation (contact unit): 0.072 min-mg/l

3. CT Credit through Filtration: 12 filters total at 3.0 MGD each

Water depth above filter - 7.92 ft, media thickness - 2.5 ft.

Volume: 700 sqft X (7.92 ft + 2.5ft) = 7,244 Cuft or 54,559 gallons

DT= 54,577 gal/3,000,000 gpd = 26.2 min

Assume BF of 0.7, thus T10 = 0.7X26.2 min = 18.3 min

CT = 0.1 mg/l X 18.3 min = 1.83 min-mg/l

CT needed for 0.5 log removal giardia (0.5 deg, pH 7.5, CL2 <0.4) = 40 min-mg/l
CT needed for 2 log removal virus = 6 min-mg/l

Giardia inactiviation ratio; 1.83 min-mg/l/40 min-mg/l = 0.046
Giardia inactiviation ; 0.5 X 0.046 = 0.023

Virus inactiviation ration; 1.83 min-mg/l/6 min-mg/l = 0.31
Virus inactiviation ; 2.0 X 0.31 = 0.62

Total giardia inactiviation (filters): 0.023 min-mg/l

2. Post Chlorination:

The Flint WTP can add chlorine to their 3 MGAL well during emergency operation. The following calculation is based upon a flow rate of 18 MGD and using a reservoir baffling factor of 0.3. Since the chlorine demand is used up during intermediate chlorination, a chlorine residual of no less than 1.5 mg/l in the clearwell (after post chlorination) is attainable. For the purpose of the CT calculation, a 1.5 mg/l free chlorine residual is used.

Assume: 0.5 deg C, pH 7.5 - unsoftened, 1.5 mg/l CL2

Detention Time (D_T) = 3,000,000 Gal/18,000,000 GPD = 0.167 days or 240 minutes

T10 = 240 min X BF.....BF = 0.28 from CL2 analyzer test

T10 = 240min X 0.28 = 67.2 min

C_T = CL2 X T10 = 1.5 mg/l X 67.2 min = 100.8 min-mg/l

C_T needed for 1/2 - Log removal of giardia @ 0.5 deg. C is 45 min - mg/l
C_T needed for 2 - Log removal of virus @ 0.5 deg. C is 6 min - mg/l

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.9}$ = 100.8 min-mg/l/45 min-mg/l = **2.24**
Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 2.24 = **1.12**

Inactivation Ratio: $C_{T\ calc}/C_{T\ 99.99}$ = 100.8 min-mg/l/ 6min-mg/l = **16.8**
Virus Inactivation: 2 X inactivation ratio or 2 X 16.7 = **33.6**

Total giardia inactivation = 1.12 log removal
Total virus inactivation = 33.6 log removal

3. Total Process:

Total giardia inact. = log removal (O3 + int. CL2 contact units & fliters + clearwell)

= 0.028 + 0.072 + 0.023 + 1.12 = 1.24 Log removal

Total virus inact, = log removal (O3 + CL2 in contact units & filters + clearwell)

= 0.06 + 1.9 + 0.62 + 33.6 = 36.2 Log removal

4. Conclusion:

Based upon the available treatment, assumptions, and calculations above, the Flint WTP can provide adequate CT at a treatment rate of 18 MGD with a free chlorine residual of 1.5 mg/l at the clearwell exit.

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 09, 2013 2:31 PM
To: Busch, Stephen (DEQ)
Subject: Flint WTP Test Run

Steve,

I will be conducting Genesee County surveillance visits tomorrow which will include a stop at the Flint WTP to observe the initial phase of their extended treatment plant test run. Based on my discussion with Brent today, the plant test run started yesterday, as planned, and the WTP will be operated this week without softening to verify proper operation of the critical treatment plant components. The WTP is currently operating at a 17.0 MGD rate. I will find out when they plan to initiate softening and, more importantly, whether they intend to send any of the treated water to the distribution system...and...if DWSD is agreeable to this. I will update you concerning the status of the plant test run. I also plan to conduct another visit during the test run while softening is being implemented.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, April 24, 2014 11:03 AM
To: Busch, Stephen (DEQ)
Subject: Flint WTP update

Steve,

Just a quick update on the Flint WTP operation. WTP operators started intermediate chlorination last night around 11pm and a residual of 1.6 ppm (free) is being measured at the bottom of each filter today. Filter effluent turbidities are between 0.03 and 0.04 NTUs and finished water hardness is around 160 ppm (raw water hardness is in the 210 to 220 range). The solids contact units are having bit more carry-over to the filters than desired, but maintaining blanket. WTP staff will investigate different polymers to improve softening performance. Filter bacteriological samples were collected earlier and the results will be available on time for tomorrow's switch-over.

*** Just received notice that the "switch-over ceremony" is now scheduled for 2pm, not 12-noon. The mayor is not available at 12 noon. I will plan to arrive at the WTP around 1:30 to 145ish.

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, August 01, 2013 3:37 PM
To: Busch, Stephen (DEQ)
Subject: Flint WTP update

Steve,

I spoke with Brent this afternoon concerning the status of the Flint WTP test run with softening. Unfortunately, WTP staff have not been successful at maintaining a stable blanket within the solids contact clarifier. They achieve a temporary blanket but then lose it in spite of making numerous treatment adjustments. Brent indicated that the solids contact unit's effluent turbidity is around 3 NTUs (on average); but they are getting more carry-over than desired.

They plan to shut down WTP operation this Sat and leave the remaining lime for the next WTP run – with softening.

Brent will be setting up a conference call with West Tech on 8/2 to discuss the softening issues and to schedule staff training.
West Tech will then plan to visit the Flint WTP to provide a full day of class room training; followed by a full day of hands-on training during the next WTP test run.

Brent is aware that I am out till Aug 12th and that he can contact you, as needed, to discuss any water related concerns.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, August 01, 2013 3:37 PM
To: Busch, Stephen (DEQ)
Subject: Flint WTP update

Steve,

I spoke with Brent this afternoon concerning the status of the Flint WTP test run with softening. Unfortunately, WTP staff have not been successful at maintaining a stable blanket within the solids contact clarifier. They achieve a temporary blanket but then lose it in spite of making numerous treatment adjustments. Brent indicated that the solids contact unit's effluent turbidity is around 3 NTUs (on average); but they are getting more carry-over than desired.

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Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

Rennaker, Joanne (DEQ)

From: Michael T. Gardner <mgardner@audgen.michigan.gov>
Sent: Monday, October 12, 2015 11:07 AM
To: Busch, Stephen (DEQ)
Cc: Shekter Smith, Liane (DEQ); Tetzlaff, Katherine (DEQ)
Subject: Flint

Good morning,

My name is Mike Gardner and I'm supervising the performance audit of the Office of Drinking Water and Municipal Assistance that is currently in progress. I believe I have met you a couple times before on other audits. As part of our audit, we would like to take a closer look at Flint's drinking water situation. Liane stated that you would be the person to meet with to obtain documentation/information concerning Flint. To begin our review, we would like to obtain some background information about Flint's change from the Detroit system to drawing water from the Flint River. I'm looking for information such as: why did Flint make the change; who made the decision to make the change; who had to approve such a change; how did Flint have the capacity to make such a change; when did the change occur; what was DEQ's involvement in the change of systems; what testing is required when such a change is made .....

I would like to set up a meeting with you in the near future to discuss Flint and to obtain information concerning the questions identified above. Please suggest a time and location for such a meeting . We are currently located on the 4th floor of the south tower but I don't have a phone in my cube. I usually work 6:30 a.m. to 4 p.m. Monday thru Thursday and 6:30 to 10:30 on Fridays. My schedule is very clean this week.

Thank you for your time.

Mike

Rennaker, Joanne (DEQ)

From: Robinson, Michael <MRobinson@wnj.com>
Sent: Tuesday, March 18, 2014 9:25 PM
To: Brim, Richard (DEQ)
Cc: Busch, Stephen (DEQ); Arduin, Jim (DEQ)
Subject: Flint

Rich, I was advised late today that the City must have this order signed by the end of this week or significant problems will occur, such as losing an entire construction season on the new water supply for Flint. I spoke very briefly with Jim Sygo about this late this afternoon. I will be contacting folks early tomorrow to get this moving and completed. I stressed with Jim Sygo that you, Jim and Steve have been doing a great job. We just need to move this to the goal line this week. I will be contacting you tomorrow morning. I will also be contacting the AG's office. I will come to Lansing any day this week to assist you, if that would help get this done. Please let me know about that.
Mike

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Thursday, May 29, 2014 12:46 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint

Have either of you talked to Lathan Jefferson recently? He left me a voicemail message with complaints about the Flint water system. Any updates would be appreciated.

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