

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, October 28, 2015 5:38 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT DELIBERATIVE. Daily Update

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

Discussed with the EPA taskforce concerning monitoring results at Freeland Elementary. A report that summarizes the results of the samples collected from the school for the lead analysis has been drafted.

Action Step 8: Review corrosion control treatment plan and get any EPA comments.

Staff discussed the items needed for the corrosion control treatment plan. An outline of a Corrosion Treatment Operation letter has been prepared. The letter will be finalized and sent to the city. Water quality parameter monitoring and laboratory certification was also discussed with the EPA taskforce.

Action Step 9: Review construction permit application/issue permit for phosphate equipment.

Completed review and verified NSF Standard 60 conformance, proper dosage and feed pump sizing. The Act 399 permit for the installation of the phosphate feed equipment was issued today.

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

Coordinated with the DEQ laboratory to create and produce the "Request for Water Analysis Forms" and the bottle order needed for sampling at Brownell K-2 STEM Academy and Eisenhower Elementary this weekend.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-10-26 DRAFT Action Steps Week of November 2-6.docx

Suggested draft Action Steps attached.

City of Flint Water Action Steps for Week of November 2 - 6

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	
3.	After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
7.	Contact DHHS regarding lead education material for schools. Provide information as requested by DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
8.	Follow up with City regarding corrosion control treatment and their plans to address requirements and options provided for in DEQ letter.	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
9.	E-mail City regarding timing to install corrosion control now that the construction permit has been issued.	DEQ	Jim Sygo Steve Busch Pat Cook	

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
			Mike Prysby	
10.	Review MOR for Standby Operation of Flint Water Treatment Plant with city of Flint. Draft letter to City documenting Standby Operation Requiriements.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
11.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues. Check weekly for status update.	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
12.	Continue evaluating city of Flint Service Line Record status and comparison to sampling pool.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Provide DHHS with any available cross-reference information regarding lead service lines and plumbing materials.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Develop childcare facility guidance or review DHHS related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
15.	Develop draft sampling protocol for residential exposure assessment for DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
16.	Make progress on drafting a generic school sampling guidance document for statewide distribution. Target audience: schools served by municipal water.	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
17.	Attend meeting arranged by DHHS regarding Residential EBL Investigations and Water Testing	DEQ and DHHS	Jim Sygo Steve Busch Mike Prysby	

Rennaker, Joanne (DEQ)

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

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

Thanks,
Mike

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

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Monday, October 19, 2015 5:14 PM
To: Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Pallone, Maggie (DEQ)
Cc: Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ)
Subject: Action Items table for the week of October 19th
Attachments: 2015-10-19 Action Steps Week of October 19-23.pdf

Importance: High

Attached are the action steps for this week.

George

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

City of Flint Water Action Steps for Week of October 19-23

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Update 2004 letter to EPA	DEQ	Dana DeBruyn	
2.	Schedule Flint Water Treatment Plant tour	DEQ and Flint	George Krisztian	To be scheduled for week of 10/19/15; waiting on confirmation from Flint
3.	Figure out number of samples from schools and child care facilities	DEQ	Jim Sygo Pat Cook Steve Busch	
4.	Conduct After Action Plan	DEQ	George Krisztian	Initial meeting to be scheduled for week of 10/19/15
5.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	
6.	After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	
7.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	
8.	\$1 million for DEQ Laboratory billing code	DEQ	Maggie Pallone George Krisztian	
9.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
10.	Develop letter to schools	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
11.	Finalize sampling protocol	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
12.	Confirm school sampling logistics	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Complete Non-Transient Non-Community Water Supply letter	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
15.	Meet with DHHS and discuss all lead education material for schools	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
16.	ODWMA staff observe a DLARA plumbing assessment	DEQ and DLARA	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
17.	Develop sample form and chain of custody document	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
18.	Provide Director Wyant with revised Part 54 language	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
19.	Review corrosion control treatment plan and get any EPA comments	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
20.	Review construction permit application and issue construction permit for phosphate equipment	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
21.	Review Standby Operation of Flint Water Treatment Plant with city of Flint	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
22.	Provide city of Flint updated monitoring schedule based on Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) service	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
23.	Contact city of Flint and Genesee County daily for DWSD connection status updates	DEQ, Flint, and Genesee County	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
24.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
25.	Verify city of Flint distribution operations under DWSD/GLWA service	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
26.	Contact city of Flint for Service Line Record status update and obtain a copy of the records to date	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
27.	Provide DHHS with any available cross-reference information	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
28.	Develop childcare facility guidance or review DHHS related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Saturday, October 17, 2015 2:03 PM
To: Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ)
Cc: Sygo, Jim (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Subject: Action Steps for the week of October 19-23
Attachments: RE: Action Steps for the week of October 19th; RE: Action Steps for the week of October 19th
Importance: High

Karen,

Attached are 25 action steps for the week of October 19-23. Please create this as a new document using the template from last week's report. This will be part of the report to the Governor for Monday October 19, 2015.

Please carry forward the following from the October 12-16 report to the October 19-23 report Please make these items 1-5 on the new report.

Item #5
 Item #9
 Item #16
 Item #25
 Item #26

Fro Points of Contact use Liane, Steve, Pat and Mike for the items listed in Steve's e-mail. Use Maggie, George, Karen for the items listed in Maggie's e-mail

Use the original name for the items that are being carried over from last week.

Please contact Liane, Steve or Maggie for clarification on any of the new action items.

I will send you a separate e-mail for action step updates taken on Friday 10/16/15.

Thank you!
 George

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

Rennaker, Joanne (DEQ)

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

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

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

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

Additional action items:

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

Thanks George.

Maggie

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

Subject: Action Steps for the week of October 19th

Importance: High

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

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

Thank you!

George

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

PRELIMINARY AND DELIBERATIVE – NOT SUBJECT TO FOIA

Action Steps for week of 10/19/2015

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, October 19, 2015 1:16 PM
To: Krisztian, George (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Deliberative and Preliminary: FW: Flint WTP PH2 SEG4 - Corrosion Control

George,

I am forwarding you EPA's comments regarding Flint's corrosion control proposal. They are suggesting a significantly higher dosage and a residential testing program to gain a better understanding on the effectiveness of the orthophosphate against corrosion of lead. Further assistance will likely be needed regarding this corrosion control proposal. Steve and I will be available to discuss this issue with you later this afternoon.

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

From: Lytle, Darren [mailto:Lytle.Darren@epa.gov]
Sent: Monday, October 19, 2015 12:05 PM
To: Prysby, Mike (DEQ)
Cc: Schock, Michael; Kempic, Jeffrey; Busch, Stephen (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Mike,

Thank-you for giving us the opportunity to review the city of Flint's corrosion control plan.

We believe it is necessary that Flint boosts orthophosphate dosage. Given that the distribution system has not received orthophosphate in over a year, we expect that orthophosphate will need to be boosted to 1) meet the demand of the distribution system, 2) reach the service lines and other lead-containing components in premise plumbing, and 3) accelerate lead reduction at the consumer's taps. Orthophosphate should preferably be added in the same form as the Detroit source which is phosphoric acid from our understanding. This is the proposed case here, however, a simple test should be performed to make sure that the pH is not impacted in a significant way at the desired target dose.

We have not been able to obtain comprehensive water quality data for the finished water characteristics of the Detroit water that will be fed to Flint, to assess ranges of major chemical characteristic fluctuations. However, based upon the email trail, Detroit water entering the Flint system appears to only contain around 0.4 PO₄/L. This concentration range is entirely too low compared to that needed in studies presented and published in the last 20+ years that have focused on lead released directly from lead pipes, and the solubility of the most likely lead orthophosphate pipes scales. We also strongly feel that targeted dose of 0.8 mg PO₄/L is also too low, for the very same reason. We would be glad to share with you numerous standard corrosion control and treatment reference works, best practices guides and published results from US and international lead corrosion control field and pilot studies. Secondly, the basis for that target (other communities using Lake Huron source use the same dose) is not scientifically derived nor does it consider water quality

and the current state of Flint's distribution system. We have reviewed the original Detroit corrosion study and have seen some of the LCR monitoring data, and besides the fact that it did not directly pertain to this water source, few dosages were tested in the cited 1994 pipe loop study, and the higher dosage than the one implemented in the field currently was more effective. Based on the limited amount of data on the quality of Detroit water, what we know about the history of Detroit corrosion control, we think an orthophosphate residual of 3 to 4 mg PO₄/L should be the minimum starting test target residual for pipe passivation. It is likely that, at least initially a higher dosage will be necessary to reach the far ends of the distribution system and sufficiently reduce lead solubility and release from all lead sources. To allow flexibility, we feel the design of the chemical feed and storage systems should be able to consistently deliver a maximum dose of 5 to 6 mg PO₄/L, if substantial orthophosphate loss is observed, if the starting dose is set for the desired residual level of 3 to 4 mg/L as PO₄. We suggest that jar tests be performed in advance of orthophosphate addition to Detroit water to evaluate the impact of orthophosphate dose on turbidity that could result from interactions between orthophosphate and background Detroit water quality parameters (e.g., aluminum, calcium, etc.).

We want to stress that immediately shifting to Detroit water and adding orthophosphate will not necessarily translate to immediate improvements. Furthermore, this is a change, albeit a return to past conditions. Nonetheless, a period of system upset should be anticipated. The need for a communication strategy and a distribution system plan are critical.

Lastly, we see no mention of a water quality monitoring program. Two programs need to be put in place immediately (before return to Detroit water) to 1) identify lead sources, 2) assess treatment effectiveness against lead release from all of the simultaneously operating mechanisms (solubility, particulate release, galvanic corrosion), and 3) assess orthophosphate levels and stability of water quality in the distribution system.

There are multiple sources of lead in the Flint distribution system to the consumers' taps, such as: pipes; leaded brass; leaded solder; accumulations on old galvanized steel pipes; possibly accumulated on copper or some plastic pipes. It is critical that the fate of orthophosphate in the distribution system is understood, and how effective it is against each type of lead source, so dosing adjustment can be properly made. For this purpose, we recommend that a number of residences throughout Flint that meet the following plumbing criteria, be identified for an assessment of the contribution lead from the different potential service line and interior plumbing sources, through detailed mapping of plumbing materials, lengths, sizes, and location and type of inline devices and faucets using profile sampling. For confidence in interpretation, probably at least 5 sites from each of the configurations will be necessary. The configurations we would estimate to be most important (but should be changed or added to if local construction practice indicates it's necessary): Lead service line, galvanized steel interior plumbing; lead service line, copper with leaded solder joints; lead service line, plastic interior plumbing. It is also possible that interior plumbing may differ from the material used for the customer-side service line segment. We would be glad to discuss the specifics of this sampling effort.

For the purpose of assessing stability of water quality in the distribution system and to inform on orthophosphate residual adjustment, we suggest that 8 to 10 locations in the distribution system be selected to measure pH, alkalinity, orthophosphate, turbidity and iron on a weekly basis. These could be collected from TCR sampling locations, or other readily-accessible buildings, should be located at a distribution of locations in the distribution system and should be collected after a flush sufficiently long to assure that "fresh" distribution system water is being measured. Research has shown that over time, orthophosphate can reduce disinfectant demand associated with corroding metallic distribution system materials. These measurements need to be performed in the field and can simply be done with a portable HACH test kit or spectrophotometer.

A lead sampling plan needs to be in place to assess the effectiveness of water change and treatment boost. LCR monitoring sites with confirmed lead service lines can be in the sampling pool. Sampling should consist of a 1 liter first draw sample (LCR sample without 5 minute pre-flush), followed by an additional flushed sample or two depending on profile sample results which is intended to capture major lead source(s). The specific details of this effort need to be worked out by the technical committee as soon as possible. We would gladly work with Flint on establishing a water sampling program to identify and verify lead service line sites. The plan and initial sampling effort should be performed before the switch so that one baseline sample set is collected.

Lastly, our strength does not fall under full-scale pump and chemical feed delivery systems. We would only say that the systems need to be scaled-up in size to accommodate our suggested dosing needs. Also, there is some discussion about diverting water to the Dort reservoir and an associated orthophosphate feed system. We are not familiar with the reservoir but are wondering if it is an open reservoir?

Of course this is a lot of information to share and we would gladly be available to discuss the technical and scientific basis for our suggestions.

Let us know if you have any questions and thanks again,

Darren and Mike

Darren A. Lytle, Ph.D., P.E.
Branch Chief (Acting)
U.S. Environmental Protection Agency
26 West Martin Luther King Dr.
Cincinnati, Ohio 45268
Phone: (513) 569-7432
Fax: (513) 487-2543
email: lytle.darren@epa.gov

From: Prysby, Mike (DEQ) [<mailto:PRYSBYM@michigan.gov>]
Sent: Friday, October 16, 2015 1:32 PM
To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>
Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Darren, Michael

We have received Flint's corrosion control proposal from their consultant. If you have comments, please provide them to me by Monday morning.

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

From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]
Sent: Friday, October 16, 2015 12:02 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

Please see attached plans for the Corrosion Control Plan for the City of Flint. I will have the official submittal package to you tomorrow afternoon after I get Brent or Mike's signature on the permit application. I will call you when I get back in Lansing to drop the package. Is three sets of full size plans adequate? Would you like some half size plans? Let me know.

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that, at least initially, there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Please let me know if the information is adequate or you require additional information.

Thanks.

Samir F. Matta, PE

Team Leader



**Lockwood, Andrews
& Newnam, Inc.**

A LEO A DALY COMPANY

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, October 20, 2015 2:29 PM
To: Busch, Stephen (DEQ)
Subject: Deliberative and Preliminary: FW: Flint WTP PH2 SEG4 - Corrosion Control

Steve,

My e-mail to EPA and their acknowledgement of receipt.

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

From: Lytle, Darren [<mailto:Lytle.Darren@epa.gov>]
Sent: Friday, October 16, 2015 2:28 PM
To: Prysby, Mike (DEQ); Schock, Michael
Cc: Busch, Stephen (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Mike,

Will do.

Thanks much for sending to us.

Darren

Darren A. Lytle, Ph.D., P.E.
 Branch Chief (Acting)
 U.S. Environmental Protection Agency
 26 West Martin Luther King Dr.
 Cincinnati, Ohio 45268
 Phone: (513) 569-7432
 Fax: (513) 487-2543
 email: lytle.darren@epa.gov

From: Prysby, Mike (DEQ) [<mailto:PRYSBYM@michigan.gov>]
Sent: Friday, October 16, 2015 1:32 PM
To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>
Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Darren, Michael

We have received Flint's corrosion control proposal from their consultant. If you have comments, please provide them to me by Monday morning.

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

From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]
Sent: Friday, October 16, 2015 12:02 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

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Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that, at least initially, there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Please let me know if the information is adequate or you require additional information.

Thanks.

Samir F. Matta, PE
Team Leader



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

1311 South Linden Road, Suite B • Flint, MI 48532
2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
D 517.819.2367 C 517.819.2367
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Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 26, 2015 2:33 PM
To: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Krisztian, George (DEQ)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)
Subject: Draft Action Plan steps
Attachments: 2015-10-26 DRAFT Action Steps Week of October 26-30.docx

DRAFT Attached.

I deleted items I believe should not be included (either done or moved to AAR).

I did not change the status summary column (perhaps I should have just erased what was in there, but I wasn't sure that was going to be helpful or not). I believe the status reflects the last updates provided on Friday, as today's updates are still being drafted.

City of Flint Water Action Steps for Week of October 26-30

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	Initial meeting held 10/22/15
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	Draft language submitted to Maggie Pallone for review
3.	After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	Panel created and press release issued on 10/21/15
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	A meeting with the 10 remaining schools is tentatively scheduled for the week of 10/26/15
7.	Meet with DHHS and discuss all lead education material for schools	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	DEQ has contacted DHHS to schedule a meeting
8.	Review corrosion control treatment plan and get any EPA comments	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	Summary of Flint's corrosion control plan submitted to EPA
9.	Review construction permit application and issue construction permit for phosphate equipment	DEQ	Jim Sygo Steve Busch Pat Cook	Additional discussions are in progress with city of Flint

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
			Mike Prysby	
10.	Review Standby Operation of Flint Water Treatment Plant with city of Flint	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	Comments by DEQ to city of Flint have been provided
11.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues. Check weekly for status update.	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	Issues regarding soil erosion controls during construction are being addressed
12.	Contact city of Flint for Service Line Record status update and obtain a copy of the records to date	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Provide DHHS with any available cross-reference information	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Develop childcare facility guidance or review DHHS related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	DEQ has contacted DHHS to schedule a meeting
15.	Create a generic school sampling guidance document for statewide distribution. Target audience: schools served by municipal water.	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	
16.	Confirm plumbing assessment and sampling is scheduled for Brownell K-2 STEM Academy and Eisenhower Elementary.	DEQ and LARA	Jim Sygo Steve Busch Mike Prysby	

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Monday, October 26, 2015 5:28 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Graham, Lois (DEQ); Devereaux, Tracy Jo (DEQ); Edgerton, Shelly (LARA); Dykema, Linda D. (DHHS)
Cc: Wyant, Dan (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wurfel, Brad (DEQ)
Subject: Draft Data and Preliminary Observations and Opinions for Freeman Elementary
Attachments: Freeman Elementary.xlsx
Importance: High

I have attached the data for the sampling that was done at Freeman Elementary. These are Preliminary Results that have NOT gone through the entire data validation process. I do not expect any changes but I want to provide that clarification at the very beginning.

Shelly and Linda please take a look as I would like to discuss the data at tomorrow's conference call.

Each sampling point has four samples (P1, P2, F01, F02)

P1= 1st Preliminary Draw of 125 mls of water

P2= 2nd Preliminary Draw of 125 mls of water

F01= 3rd Sample in the series. This sample was taken after a 30 second flush after P2

F02= 4th sample in the series. This sample was taken after a 2 minute flush after F01.

In general one would expect P1 samples to have the highest values and F02 samples to have the lowest values and overall this held very true.

We can discuss further tomorrow.

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	ACODE	ANALYTE	RESULT	Sample_Description
LF88751	PB	Lead	0.010	CF022 RM 12
LF88752	PB	Lead	0.003	CF022 RM 12
LF88753	PB	Lead	0.001	CF022 RM 12
LF88754	PB	Lead	0.001	CF022 RM 12
LF88755	PB	Lead	0.004	CF021 RM 12
LF88756	PB	Lead	0.007	CF021 RM 12
LF88757	PB	Lead	0.000	CF021 12
LF88758	PB	Lead	0.000	CF021 RM 12
LF88759	PB	Lead	0.009	CF009 RM 5
LF88760	PB	Lead	0.002	CF009 RM 5
LF88761	PB	Lead	0.002	CF009 RM 5
LF88762	PB	Lead	0.001	CF009 RM 5
LF88763	PB	Lead		CF015 RM 11
LF88764	PB	Lead		CF015 RM 11
LF88765	PB	Lead	0.014	CF015 RM 11
LF88766	PB	Lead	0.011	CF015 RM 11
LF88767	PB	Lead	0.003	CF016 RM 11
LF88768	PB	Lead	0.003	CF016 RM 11
LF88769	PB	Lead	0.005	CF016 RM 11
LF88770	PB	Lead	0.004	CF016 RM 11
LF88771	PB	Lead	0.009	CF027 RM 21
LF88772	PB	Lead	0.007	CF027 RM 21
LF88773	PB	Lead	0.000	CF027 RM 21
LF88774	PB	Lead	0.000	CF027 RM 21
LF88775	PB	Lead	0.012	CF010 RM 6
LF88776	PB	Lead	0.004	CF010 RM 6
LF88777	PB	Lead	0.002	CF010 RM 6
LF88778	PB	Lead	0.000	CF010 RM 6
LF88779	PB	Lead	0.009	CF028 RM 21
LF88780	PB	Lead	0.002	CF028 RM 21
LF88781	PB	Lead	0.001	CF028 RM #21
LF88782	PB	Lead	0.001	CF028 RM #21
LF88783	PB	Lead		CF024 RM #19
LF88784	PB	Lead	0.003	CF024 RM #19
LF88785	PB	Lead	0.004	CF024 RM #19
LF88786	PB	Lead	0.003	CF024 RM #19
LF88787	PB	Lead	0.005	KC003 COMMUNITY ROOM
LF88788	PB	Lead	0.002	KC003 COMMUNITY ROOM
LF88789	PB	Lead	0.000	KC003 COMMUNITY ROOM
LF88790	PB	Lead	0.000	KC003 COMMUNITY SCHOOL
LF88791	PB	Lead	0.009	CF023 RM #19
LF88792	PB	Lead	0.009	CF023 RM #19
LF88793	PB	Lead	0.001	CF023 RM #19
LF88794	PB	Lead	0.000	CF023 RM #19
LF88795	PB	Lead	0.015	DW002 HALLWAY
LF88796	PB	Lead	0.006	DW002 HALLWAY
LF88797	PB	Lead	0.004	DW002 HALLWAY
LF88798	PB	Lead	0.001	DW002 HALLWAY
LF88799	PB	Lead	0.002	CF012 RM #9
LF88800	PB	Lead	0.004	CF012 RM #9
LF88801	PB	Lead	0.002	CF012 RM #9
LF88802	PB	Lead	0.000	CF012 RM #9
LF88803	PB	Lead		DW001 HALLWAY
LF88804	PB	Lead	0.006	DW001 HALLWAY

LF88805	PB	Lead	0.004	DW001 HALLWAY
LF88806	PB	Lead	0.001	DW001 HALLWAY
LF88807	PB	Lead	0.014	CF018 RM#15
LF88808	PB	Lead	0.005	CF018 RM#15
LF88809	PB	Lead	0.002	CF018 RM#15
LF88810	PB	Lead	0.002	CF018 RM#15
LF88811	PB	Lead	0.010	CF017 RM#15
LF88812	PB	Lead	0.014	CF01 RM#15
LF88813	PB	Lead	0.002	CF017 RM#15
LF88814	PB	Lead	0.002	CF017 RM#15
LF88815	PB	Lead		CF029 DHS OFFICE
LF88816	PB	Lead	0.012	CF029 DHS OFFICE
LF88817	PB	Lead	0.002	CF029 DHS OFFICE
LF88818	PB	Lead	0.000	CF029 DHF OFFICE
LF88819	PB	Lead	0.013	CF008 RM#4
LF88820	PB	Lead	0.006	CF008 RM#4
LF88821	PB	Lead	0.001	CF008 RM#4
LF88822	PB	Lead	0.000	CF008 RM#4
LF88823	PB	Lead	0.007	CF007 RM#3
LF88824	PB	Lead	0.006	CF007 RM #3
LF88825	PB	Lead	0.003	CF007 RM#3
LF88826	PB	Lead	0.002	CF007 RM#3
LF88827	PB	Lead		CF014 ROOM #10
LF88828	PB	Lead	0.007	CF014- ROOM #10
LF88829	PB	Lead	0.004	CF014-ROOM #10
LF88830	PB	Lead	0.003	CF014-ROOM #10
LF88831	PB	Lead		CF026 ROOM #14
LF88832	PB	Lead		CF026 ROOM #14
LF88833	PB	Lead		CF026 ROOM #14
LF88834	PB	Lead	0.004	CF026 ROOM #14
LF88835	PB	Lead	0.005	CF019 ROOM #17
LF88836	PB	Lead	0.003	CF019 ROOM #17
LF88837	PB	Lead	0.001	CF019 ROOM #17
LF88838	PB	Lead	0.000	CF019 ROOM #17
LF88839	PB	Lead	0.000	CF025 ROOM 14
LF88840	PB	Lead	0.003	CF015 ROOM #14
LF88841	PB	Lead	0.003	CF025 ROOM #14
LF88842	PB	Lead	0.002	CF025 ROOM #14
LF88843	PB	Lead	0.009	CF013 ROOM #10
LF88844	PB	Lead		CF013- ROOM #10
LF88845	PB	Lead	0.003	CF013 ROOM #10
LF88846	PB	Lead	0.003	CF013 ROOM #10
LF88847	PB	Lead	0.013	CF020 ROOM #17
LF88848	PB	Lead	0.004	CF020 ROOM #7
LF88849	PB	Lead	0.005	CF020 ROOM #17
LF88850	PB	Lead	0.003	CF020 ROOM #17
LF88851	PB	Lead		CF006 ROOM#2
LF88852	PB	Lead	0.003	CF006 ROOM #2
LF88853	PB	Lead	0.001	CF006 ROOM #2
LF88854	PB	Lead	0.001	CF006 ROOM #2
LF88855	PB	Lead	0.002	CF011 ROOM #7
LF88856	PB	Lead	0.000	CF011 ROOM #7
LF88857	PB	Lead	0.002	CF011 ROOM #7
LF88858	PB	Lead	0.000	CF011 ROOM #7
LF88859	PB	Lead		CF031 RAINBOW PRE K

LF88860	PB	Lead	0.003	CF031 RAINBOW PREK
LF88861	PB	Lead	0.002	CF031 RAINBOW PREK
LF88862	PB	Lead	0.000	CF031 RAINBOW PRE K
LF88863	PB	Lead	0.010	CF030 RAINBOW PRE K
LF88864	PB	Lead	0.003	CF030 RAINBOW PRE K
LF88865	PB	Lead	0.007	CF030 RAINBOW PRE K
LF88866	PB	Lead	0.000	CF030 RAINBOW PRE K
LF88867	PB	Lead	0.012	CF004 ROOM #7
LF88868	PB	Lead	0.007	CF004 ROOM #1
LF88869	PB	Lead	0.004	CF004 ROOM #1
LF88870	PB	Lead	0.002	CF004 ROOM #1
LF88871	PB	Lead	0.005	DW005 ROOM #1
LF88872	PB	Lead	0.003	DW005 ROOM #1
LF88873	PB	Lead	0.003	DW005 ROOM #1
LF88874	PB	Lead	0.002	DW001 ROOM #1

P2
F01
F02
P1
P2
F01
F02
P1
P2
F01
F02
P1
P2
F01
F02

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 26, 2015 5:19 PM
To: Krisztian, George (DEQ); Shaler, Karen (DEQ)
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE. Daily update 10/26.

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

Confirmed meeting tomorrow (10/27) with DHHS to discuss.

Action Step 9: Review Construction Permit Application and issue permit for phosphate equipment.

Mike Prysby discussed with the city of Flint's consultant remaining items that are needed for issuance of Michigan's Safe Drinking Water Act (Act 399) construction permit. Staff anticipate receiving these items tomorrow.

Action Step 12: Contact city of Flint for Service Line Record status update and obtain a copy of the records to date.

Staff obtained approximately 10,895 records from the City's GIS system regarding service line index cards and extracted into a table format for additional data review. Data review has been initiated by Lansing District staff.

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

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

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 30, 2015 5:29 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT DELIBERATIVE. Daily Update

Action Step 8: Review corrosion control treatment plan and get any EPA comments.

Comments received late today from EPA were addressed and the letter to the city regarding operational and monitoring conditions related to corrosion control was finalized. An electronic copy of the letter was sent to the city of Flint and EPA.

Action Step 16: Confirm plumbing assessment and sampling is scheduled for Brownell and Eisenhower Elementary Schools:

LARA and DEQ staff conducted plumbing assessments at both Brownell and Eisenhower Elementary Schools. Sampling taps were identified and labeled. And a sampling sequence was recommended for each school. A briefing of the plumbing layout and sampling details was provided to the sampling teams. Two sampling teams will be deployed on Saturday to conduct lead/copper sampling at both schools and additional sampling will be conducted at Freeman Elementary School.

Liane J. Shekter Smith, P.E.
Assistant to Chief Deputy Director Jim Sygo
Michigan Department of Environmental Quality
517-284-6543

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 22, 2015 5:39 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE. Daily Update
Attachments: Monitoring Schedule 4th Qtr - 2015.pdf

Action Step 11: Finalize sampling protocol:

Participated on a conference call with EPA Task Force to discuss proposed sampling protocol and the comments received from EPA. Agreed to reconvene a call next week to discuss how the pilot sampling efforts goes, what went well, what might need to be adjusted, etc.

Action Step 19: Corrosion Control Treatment plan:

A summary of our discussion with EPA regarding Flint's corrosion control plan was provided to Darren Lytle and Michael Schock of EPA. The summary included confirmation of the actual phosphate dosage from the Detroit Lake Huron WTP. Steve's summary to EPA is included in the thread below.

Action Step 20: Act 399 permit for phosphate feed system:

Proper dosages are now confirmed based on incoming P04 residual at Flint. A product cut-sheet to confirm NSF approval and max dose is to be provided shortly. The consultant will also confirm proper sizing of the feed pumps. Anticipate receiving this info tomorrow which will facilitate issuance of the Act 399 permit.

Action Step 22: Provide Flint with an updated monitoring schedule:

An updated monitoring schedule is completed and signed. The schedule will be mailed to the city tomorrow. A copy of the updated monitoring schedule is attached.

Action Step No. 24: Work with KWA to address bottleneck issues:

An electronic communication was sent to Genesee County (John O'Brien) informing him of our concern over improper soil erosion control measures at the pipeline jobsite and what corrective measures were being taken to avoid a potential halt of construction by the Lapeer County Road Comm. Genesee County has not responded thus far.

Liane J. Shekter Smith, P.E.
 Assistant to Chief Deputy Director Jim Sygo
 Michigan Department of Environmental Quality
 517-284-6543



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 22, 2015

Mr. Brent Wright
City Of Flint – D.P.W
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Revised Drinking Water Monitoring Schedule – 2015
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for remainder of calendar year 2015 outlining the minimum requirements for your public water supply. Your schedule has been revised based on the City's change in source of its drinking water from the treatment of the Flint River utilizing the City's Water Treatment Plant to the Great Lakes Water Authority/Detroit Water and Sewerage Department. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the Department of Environmental Quality Laboratory, you can order bottles by calling 517-335-8184. Be certain of the United States Environmental Protection Agency sampling and analysis method requirements for hold times.

Monthly Operation Report (MOR) Requirements:

The City shall submit MORs as required under Administrative Rule 1502 (R325.11502). Please note required coliform bacteria monitoring results and associated chlorine residual monitoring shall be submitted to the department within the first 10 days following the end of the required monthly monitoring period. In addition, monthly operation reports shall be submitted to the department during the month following the month for which the monthly operation report was prepared.

Mr. Brent Wright

2

October 22, 2015

Disinfection By-Product Sample Siting Plans:

The City of Flint shall continue routine standard monitoring of disinfection by-products, according to your Disinfection & Disinfectants By-Product (DDBP) plan which identifies 8 sites for routine quarterly monitoring.

Lead and Copper Monitoring Requirements and Site Sample Pool

Please note distribution system monitoring for water quality parameters (WQPs) continues at the expanded set of 25 sites per quarter. Lead and copper monitoring in accordance with the requirements of Administrative Rule 710a (R325.10710a) is being required for the 6 month period between January 1, 2016 and June 30, 2016. The City must ensure its sample site pool is large enough to collect the number of lead and copper tap samples required. All sites from which first draw samples are collected shall be selected from the pool of targeted sampling sites.

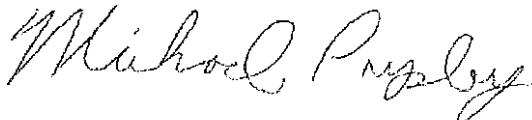
The City shall also conduct additional operational monitoring to demonstrate the effectiveness of corrosion control treatment.

Record Keeping:

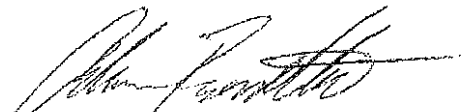
The City shall maintain all monitoring records in accordance with all applicable requirements under the Administrative Rules including Rule 720a (R325.10720a), Rule 1506 (R325.11506), and Rule 1507 (R325.11507).

The Michigan Safe Drinking Water Act requires certain reports to be submitted to this office each year. Please remember that cross connection reports and annual pumpage reports are due by March 31, and the **Consumer Confidence Report** is due by July 1.

Also enclosed is the document "2015 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us using the information below.



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



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

Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint
Genesee County Health Department

2015 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

Collect samples early in the monitoring period. This schedule reflects your expected routine monitoring and is subject to change. To receive credit for monitoring, include the WSSN, Site Code, and County on your request for analysis form. Collect Bacteriological and Automated Partial Chemistry samples close to the shipping time and send overnight delivery. Send all sample results to your Department of Environmental Quality (DEQ) district office unless you use the DEQ laboratory. Test codes, sample units, and costs are listed to help you complete the DEQ laboratory form. Prices are subject to change without notice. The DEQ laboratory is closed on state holidays.

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	If serving chlorinated water, measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2015	See DBP Monitoring Plan	\$130.00	36HA	CXHA
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	60/6 months	Between 1/1 and 6/30/2016	DIST	\$26.00	36CC	CCUB

Community Water Supply 2015 Monitoring and Reporting Requirements

Please Monitor Early: Collect samples early in the monitoring period (month, quarter, year) of the year indicated on the schedule. Bacteriological and partial chemistry samples should be collected close to the shipping time and sent overnight delivery to assure sample holding times are not exceeded (30 and 48 hour hold times respectively). We also recommend avoiding mailing bacteriological samples immediately preceding or following a holiday because samples tend to exceed the 30 hour hold time. When this occurs, a repeat sample must be collected as soon as possible upon notification.

If you use a private laboratory please report the results to us within the first ten days of the month following the month that you received the results. A list of certified laboratories is available on request. If samples are not collected as indicated on your monitoring schedule, you will incur a monitoring violation and possibly a fine. For information on the fines policy, visit <http://michigan.gov/deqwater>. Click on Drinking Water, Community Water Supply, and Administrative Fines (under Laws and Rules).

To receive credit for monitoring, you must include the **"WSSN"** (water supply serial number), the **"Site Code,"** and the **"County"** when you submit samples for analysis. Site codes are listed on your monitoring schedule.

Special Instructions If You Use The DEQ Laboratory: Bottles will NOT be mailed automatically. To order bottles, call the DEQ Laboratory at 517-335-8184 or download the form EQP 2301 *Requisition for Water Sample Units* from www.michigan.gov/deq. Click on Key Topics, Laboratory Services, Drinking Water, Obtaining The Necessary Sampling Units, and 'test list'. Please note that the DEQ laboratory is closed on most state holidays. The DEQ laboratory prices are subject to change without notice.

Special Instructions For Automated Partial Chemistry, VOC and TTHM Samples: These sample bottles must be cooled and preserved during shipment to the laboratory. If you use the DEQ laboratory, you will receive the ice pack, acid dropper (if necessary) and small cooler when you request the bottles. Samples must be preserved correctly to be used for compliance purposes. To avoid resampling follow instructions contained with the sample bottle. If you would like more information, contact the DEQ lab, at 517-335-8184, or contact this office.

Cyanide: Previously, supplies that chlorinated the water were waived from monitoring for cyanide. The U.S. EPA now requires all supplies to sample the entry point for cyanide.

UCMR3 Monitoring: You may have monitoring requirements in 2015 under the third Unregulated Contaminant Monitoring Rule (UCMR3). The U.S. EPA will contact you directly if your water supply is required to monitor in 2015. A list of laboratories certified to analyze the samples collected for UCMR3 is available at <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/upload/lablist.pdf>. Contact the U.S. EPA with questions.

Reminder if Lead and Copper Monitoring Due This Year: Provide individual lead tap results to people who receive water from sites that you sampled, even if lead was not detected, within 30 days of learning the results. Send us a certification that you met all the delivery requirements along with a sample copy of the customer notice within 3 months after the end of the monitoring period. Water supplies that failed to distribute the Consumer Notice of Lead Results must include the following statement in their CCR, "During the year, we failed to provide lead results to persons served at the sites that were tested as required by the Lead and Copper Rule." To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit www.michigan.gov/deqwater. Click on Drinking Water, Community Water Supply, and Reporting Forms (under Manuals, Forms & Brochures).

Annual Reports: These reports are due to this office each year.

- The **Cross Connection Report**, due by March 31, describes the status of your local cross connection control program. Manufactured housing communities are exempt from this requirements until 2016.

Each year, water supplies must submit this report, even if a formal program has not been implemented. If cross connections do not exist in your water system, indicate so on the report. Download the Cross Connection Report form from <http://michigan.gov/deqwater>. Click on Drinking Water, Community Water Supply, Reporting Forms (under Manuals, Forms & Brochures). Instructions are included with the form.

- The **Annual Pumpage/Usage Report**, due by March 31, is required of water supplies that do not submit monthly operation reports.

This summary of water pumpage and water use must be submitted by each water supply that does not submit a monthly operation report. To manage our natural resources, pumpage data are compiled to determine water use demands in Michigan. Download the Annual Pumpage/Usage Report form from <http://michigan.gov/deqwater>. Click on Drinking Water, Community Water Supply, Reporting Forms (under Manuals, Forms & Brochures). Please be sure to indicate the appropriate units on the report (e.g. million gallons or gallons).

- The **Consumer Confidence Report**, due by July 1 to your customers, to your local health department and to this office, describes the quality of the water and characterizes the risks, if any, from exposure to contaminants detected..

Electronic delivery methods may be used to distribute the CCR to bill-paying customers, provided the method is direct. A paper copy must be delivered to bill-paying customers who request it or known to be unable to receive the CCR electronically. For more information on e-delivery, visit www.michigan.gov/deqwater. Click on Drinking Water, Community Water Supply, Consumer Confidence Report Rule (under Laws and Rules).

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 23, 2015 5:31 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE. Daily update

Action Step 11: Finalize sampling protocol:

Sampling protocol was revised to address comments received on 10/22 from EPA Task Force.

Action Step 15: ODWMA staff observe a DLARA plumbing assessment:

Staff assisted DLARA in conducting a plumbing assessment at the Freeman Elementary School. Actions were taken to prepare for sampling to be conducted on Saturday.

Action Step 18: Review Act 399 Permit application and issue permit for phosphate Equip:

The information requested by the DEQ was not received from Flint's consultant today; thus permit was not issued. Discussed with WTP operator Brent Wright and Michael Glasgow (Utilities Supt). Brent confirmed that he needs to provide some of the information regarding the PO4 product to the consultant.

Action Step 19: Review stand-by operation of Flint WTP:

Discussed with Michael Glasgow and Brent Wright the need for quarterly test runs and monthly operation reporting details while the plant is in stand-by mode. Also included the need to report phosphate dosages and phosphate residuals (plant tap and distribution) in the monthly operation report.

Action Step 22: Work with KWA to address bottleneck issues:

John O'Brien (Genesee Co. Drain Comm.'s office) contacted me in response to yesterday's e-mail. Lapeer Co. Road Comm. has placed a stop work order on Contract S-4005; however, the Drain Commissioner's Office contends that the road comm. has no authority to issue a stop work order; thus work is continuing. I stressed the importance to John of the need to keep the project moving forward and to confirm that the contractor is following proper soil erosion measures and other local guidelines that may apply.

Action Step 23: Verify Flint distribution operations under DWSD service:

Based on discussion with Michael Glasgow and Brent Wright, there have not been major distribution system issues or upsets since the switch back to DWSD. Utility operators were flushing and winterizing hydrants this week and flushing from the water treatment plant to the outside reaches of the distribution system. Phosphate residuals are also being measured twice per week at the city's bacteria monitoring sites.

Liane J. Shekter Smith, P.E.
 Assistant to Chief Deputy Director Jim Sygo
 Michigan Department of Environmental Quality
 517-284-6543

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, October 27, 2015 5:30 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT DELIBERATIVE. Daily update

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

Action Step 14: Develop childcare facility guidance or review DHHS related materials

DEQ met with DHHS staff to review and further develop guidance and incorporate drinking water exposure information. Guidance is being provided by DHHS specific to the County emergency order and separate guidance for statewide use will also be developed.

Action Step 9: Review construction permit application and issue construction permit for phosphate equipment.

Lansing District office received updated dosage, pump specifications and cut-sheets for phosphate product late Tuesday. A quick glance at the submittal shows most of the requested information has been provided except for NSF 60 certification and max dose. Staff will cross reference the NSF website to verify proper certification and maximum dose. If acceptable, staff will proceed with issuance of the Act 399 permit, otherwise, the consultant will need to provide us with the NSF Standard 60 certification and maximum dose information.

Action Step 12: Contact city of Flint for Service Line Record status update and obtain a copy of the records to date.

Staff were only able to cross reference 46 of the 326 historical lead and copper monitoring sampling sites with the service line index card information, 10,895 records.

Preliminary follow-up review of sampling event at Freeman Elementary:

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

Liane J. Shekter Smith, P.E.
 Assistant to Chief Deputy Director Jim Sygo
 Michigan Department of Environmental Quality
 517-284-6543

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 12, 2015 5:43 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA. Daily update 10/12.

Action Step #3 – preliminary comments on the sampling plan were received today from DHHS.

Action Step #5 – Noncommunity water supply staff provided updated numbers today to the 2004 letter to EPA.

Action Step #6 – Discussions occurred today with the City; disinfection of the transmission main continues. Bacteriological sampling is anticipated to begin Tuesday, 10/13, with a second set of samples to be collected on Wednesday. Assuming the sampling is all non-detect, the pipeline that will provide the city with water from Detroit could be placed into service by this Thursday (the soonest). Other non-regulatory actions may need to be undertaken or completed by the city.

Action Step #15 – Discussion today with MDARD representative regarding sampling for restaurants at their request. MDARD shared a draft of information/guidance that they have prepared to share with restaurants. DEQ will be providing guidance for how to get their water tested.

Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
517-284-6543

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, October 14, 2015 5:29 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA. Daily update 10/14

Action Step No. 2

E-mail sent to DLARA with draft sampling ID protocol.

E-mail drafted with request for schools to prepare documents/information ahead of DLARA visit and on-site assessment. Waiting for comments.

Action Step No. 6.

Pipeline flushed and first round of samples for bacteriological analysis collected yesterday (4am at mid-point, 7:30am at CS #3 – Flint WTP) were Non-Detect for total coliform.

The second round of samples were collected yesterday evening at mid-point (Genesee County) and late last night at CS #3 (Flint). Results will be available later this evening and read first thing tomorrow morning. If the second set is all clear, the pipeline will be ready to be placed into service (from a technical standpoint). The pipeline; however, will not be placed into service until Flint, Genesee County, and Detroit agree on and establish a service contract.

The Dort Reservoir will not be placed into service (this facility can be by-passed) until the city determines what to do with the 6 Mgal of water (chlorinated at approx. 100 ppm). What they thought was a connection to the sanitary sewer was discovered yesterday to be a connection to the storm sewer.

Action Step #18 Contact KWA regarding bottlenecks in expediting construction of pipeline.

No further updates since my e-mail sent to you earlier today

Action Step #19: Expedite 399 plan for corrosion control

No updates today

Liane J. Shekter Smith, P.E., Chief
 Office of Drinking Water and Municipal Assistance
 Michigan Department of Environmental Quality
 517-284-6543

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, October 13, 2015 5:12 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ); Philip, Kris (DEQ); DeBruyn, Dana (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - daily update 10/13.

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

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

Action Step 3. Preliminary comments received by voice mail from EPA. Need to discuss directly.

Action Step 4. DEQ comments provided to MDARD and draft forwarded to DHHS for their comments.

Action Step 6. Approve Flint Plan for waterline

The city and the county flushed the pipeline beginning yesterday, the first set of samples for total coliform analysis were collected around 2:30am. Genesee County will be collecting their second sample for bacteriological analysis between 6 and 8pm.

I suspect that it will take additional time to flush the Dort Reservoir before it is ready to be sampled and may set back the time that the pipeline is ready to be placed into operation (Thurs the soonest possible). The yard piping configuration at the WTP does allow for flexibility in operation and ability to take Dort out of service and maintain supply from Detroit; however, I have not been able to confirm that this is the way the city plans to proceed.

Action Step 7. E-mail sent to DHHS to determine if DEQ or DHHS will be lead and to determine how this effort will be coordinated with broader Pb education/outreach efforts.

Action Step 19. Expedite 399 plan and P04 plan

I contacted Samir Matta from LAN (Flint's consultant) for an update on the corrosion control plan and submittal of the Act 399 permit application. Flint operators, with the assistance of LAN, conducted bench tests using a corrosion inhibitor (orthophosphate) and are making comparisons for use with (treated water from Detroit vs. water treated from the Flint River). LAN is currently preparing plans and a design for installation of an orthophosphate feed system. LAN expects to submit the Act 399 permit application to the DEQ by no later than the end of this week.

Action Step 18. Contact KWA to find out if there are any bottlenecks that need to be removed to expedite completion of the KWA pipeline.

I contacted John O'Brien (Genesee County Drain Commissioner's Office). The most significant bottleneck involves road restrictions currently being imposed by the Lapeer County Road Commission and include:

- All Lapeer County secondary north-south roads are tagged "no construction traffic" for this project except for primary roads (M-19, M-53, and M-24). This significantly increases distances that construction vehicles must travel (upwards of 15 to 20 miles) to accomplish a short jog either north or south.

- Weight restrictions in the spring will cause construction to slow or stop for one to two months. The county has indicated that St. Clair and Sanilac are not imposing the weight restrictions; however, Lapeer County will maintain their restrictions.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, October 13, 2015 2:07 PM
To: Dykema, Linda D. (DHHS); Groetsch, Kory J. (DHHS)
Cc: Krisztian, George (DEQ); DeBruyn, Dana (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Besey, Kevin (MDARD)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - Draft recommendations for restaurants from MDARD
Attachments: Food Establishment Recommendations City of Flint Drinking Water Regarding Lead with DEQ comments.docx
Importance: High

Linda and Kory –

The attached document was created by MDARD and modified by DEQ NCWS staff. MDARD plans to e-mail this to food establishments in the flint area and also provide it to the Genesee County LHD for their use. MDARD is anxious to get this out to restaurants but would like your review/comments prior to finalizing.

This is a request for content review. They'll take care of making it look nice.

Comments can go back to MDARD directly (Kevin Besey), but I'd like to be cc'd also so that we can see your comments also. That will help us craft future messages.

Thanks.

Recommendations for Licensed Food Establishments Using City of Flint Water with Lead Concerns
DRAFT October, 13, 2015

Attention: restaurants, grocery stores, convenience stores, food processors and food warehouses.

- The best way to determine if water contains lead is to have it tested. Safe results can be posted to inform consumers.
- Information to test your water is available on-line at: DEQ – Laboratory Services at www.michigan.gov/deqlab or call 517-335-8184. To test for Lead and Copper, request a 36CC water test. This will cost \$26 per sample.

Do the following each day of operation unless the water has been tested and found to not have a lead concern:

- Flush water lines for 5 minutes before using or serving water and after 6 hours of no water use. Then flush other equipment such as pop machines for at least 1-2 minutes.
- Install an NSF Standard 53 certified filter on the faucet where drinking / cooking water is obtained from. Approved filter information for faucet or in-line filters can be found at: <http://nsf.com/newsroom/statement-regarding-flint-water-system-lead-issue-and-to-certification-nsf>
- Use cold water and store it in pitchers for immediate consumption.
- Always use cold water for drinking, cooking and rinsing food.
- Hot water must used for dishwashing.

Other equipment that may use city water:

- Ice machines – Do not use ice machines. Use bagged ice in drinking water.
- Pop Machines – Flush for 1-2 minutes daily or use bottled beverages.
- Coffee Machines or Tea Urns – Flush for 1-2 minutes daily or use filtered water. These products may be very low risk as young children under 6 are not likely to consume them.
- Slush machines – Use filtered water.
- Spray Misters – Flush for 1-2 minutes daily or use filtered water.

A licensed plumber can check your plumbing and service lines for lead soldering or lead service lines.

Restaurants with questions should contact Genesee County Health Department at: 810-257-3612.

Grocery or Food Processing establishments with questions should contact MDARD at 1-800-292-3939.

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, October 14, 2015 4:29 PM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA. - Action Steps update

George,

Below is a status update on the Action Steps assigned to me:

Action Step No. 6. Approve Flint plan for re-use of pipeline

Pipeline flushed and first round of samples for bacteriological analysis collected yesterday (4am at mid-point, 7:30am at CS #3 – Flint WTP) were Non-Detect for total coliform. The second round of samples were collected yesterday evening at mid-point (Genesee County) and late last night at CS #3 (Flint). Results will be available later this evening and read first thing tomorrow morning. If the second set is all clear, the pipeline will be ready to be placed into service (from a technical standpoint). The pipeline; however, will not be placed into service until Flint, Genesee County, and Detroit agree on and establish a service contract.

The Dort Reservoir will not be placed into service (this facility can be by-passed) until the city determines what to do with the 6 Mgal of water (chlorinated at approx. 100 ppm). What they thought was a connection to the sanitary sewer was discovered yesterday to be a connection to the storm sewer.

Action Step #18 Contact KWA regarding bottlenecks in expediting construction of pipeline.

No further updates since my e-mail sent to you earlier today

Action Step #19: Expedite 399 plan for corrosion control

No updates today

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

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, October 14, 2015 2:38 PM
To: Krisztian, George (DEQ); Busch, Stephen (DEQ); Madziar, Joseph (LARA)
Cc: Sygo, Jim (DEQ); Devereaux, Tracy Jo (DEQ); Shaler, Karen (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA. - Draft e-mail to Schools prior to LARA visit.

In order to prepare for DLARA's visit, we should send an e-mail to the 3 elementary schools which will be evaluated first according to the priority scheme developed. The following draft e-mail is a suggestion. We'll need contact/e-mail information for each school (not sure who can most readily get this). Also, we should discuss who should send out the note:

In follow-up to the Governor's Action Plan for the city of Flint, state and local resources are being marshalled to conduct lead and copper sampling at your school. Freeman Elementary (need to customize for each e-mail) is scheduled to be visited by Department of Licensing and Regulatory Affairs (LARA) plumbing inspectors in order to perform an on-site assessment of the buildings plumbing prior to samples being collected for a lead and copper evaluation.

In order to assist LARA staff to identify and prioritize sample sites, school staff should compile, collect, and review any records pertaining to the building plumbing. This includes building permits, plumbing permits, as built plans, and information about the service line and all potable water pipes, fixtures and appurtenances within the building. At a minimum, a diagram of each floor layout should be provided. In addition, answers to the following questions will help streamline the on-site assessment process.

- When was the facility built?
- Have new buildings or additions been added? If so, when were they added? If built since 1986, were lead-free plumbing and solder used?
- When were the most recent plumbing repairs made and where were they located?
- What are the potable water pipes in your facility made of and what is their location? Options include: lead, brass, copper, plastic, galvanized metal and other materials. What materials were used to solder the potable water pipes in your system? Are brass taps, fittings or valves used? Note the locations.
- How many of the following outlets provide water for consumption: Bubblers, ice makers, water coolers and kitchen taps. Note their location. Include taps that might be used for making coffee or preparing formula.
- What brands and models of water coolers (cooled drinking fountains) provide water in your facility and what is their location?
- Do faucets have accessible screens and have they been cleaned?
- Can you detect any signs of corrosion, such as leaks, rust-colored water or stains?
- Is any electrical equipment grounded to water pipes?
- Are there any records of previous water testing?

LARA staff will be contacting you to set a date and time for the assessment. A school representative familiar with the building layout and plumbing system needs to accompany LARA staff as they conduct the assessment. A room reserved for records review should also be available.

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, October 16, 2014 10:59 AM
To: Poy, Thomas
Cc: Busch, Stephen (DEQ)
Subject: DRAFT Flint Controlled Correspondence
Attachments: Flint Michigan Control.docx

Importance: High

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

Thank you!!

Jennifer

Ms. Tokoya Cureton

324 West Jackson Avenue

Flint, MI 48505

Dear Ms. Cureton:

Thank you for your email to President Obama dated October 2, 2014, concerning the quality of the drinking water the City of Flint, Michigan. Your letter was forwarded to me for a response, since the Flint municipal water supply is located within the geographical boundaries of the Region 5 office of the U.S. Environmental Protection Agency (U.S. EPA).

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 Michigan Department of Environmental Quality (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 pipeline which will draw water from Lake Huron, in 2016.

Your letter referred to "bad water quality" since the switch to use of Flint River water as Flint's source of drinking water. My staff contacted the MDEQ District Engineer, Mike Prysby, to discuss the Flint drinking water issues. Mr. Prysby 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. The MDEQ contacted the Flint Water Department to discuss your concerns and your contact information was provided to them. The Water Department will be flushing water mains and fire hydrants in your neighborhood. For further information, you can contact Mr. 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 about ten minutes at least 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 in your neighborhood should alleviate the sediment and brown water issues.

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

We appreciate your interest in this matter. If you have additional questions, please contact Jennifer Crooks of my staff at (312) 886-0244 or crooks.jennifer@epa.gov.

Sincerely,

Tinka Hyde, Director

Water Division

cc: Mike Prysby, MDEQ

Steve Busch, MDEQ

bcc: J. Crooks, GWDWB

T. Murphy, GWDWB

AX-15-000-0379-WH

Rennaker, Joanne (DEQ)

From: Poy, Thomas <poy.thomas@epa.gov>
Sent: Friday, September 11, 2015 2:49 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Crooks, Jennifer
Subject: Draft Response
Attachments: AL-15-001-3725 (Kildee Flint) 9-11-15.docx

Liane: Here is my draft response that I sent up the mgmt chain. As I mentioned on the call, it will likely be edited down as the RA likes one page responses.

Tom

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

The Honorable Daniel Kildee
Member, U.S. House of Representatives
Washington, DC 20515-1313

Dear Congressman Kildee:

Thank you for your September 9, 2015 letter regarding drinking water quality in Flint and the June 24, 2015 U. S. Environmental Protection Agency memorandum from Miguel A. Del Toral to Thomas Poy. EPA shares your concern about the quality of the drinking water in Flint. Our focus has been to work with the Michigan Department of Environmental Quality (MDEQ) and the City of Flint so they can provide clean and safe water to its residents.

Mr. Del Toral's June 24, 2015 internal memo summarizing the activities conducted in response to a Flint resident's request for help with high lead levels and expressing his concerns about Flint's drinking water was sent to Mr. Poy. Mr. Del Toral's statements in the memorandum regarding concerns about lead levels in Flint are his professional judgments based on the facts that Flint has not provided corrosion control treatment after switching source waters and that EPA sample results from some homes in Flint found high levels of lead. In addition, the last two rounds of compliance monitoring conducted by Flint, while below the lead action level of 15 micrograms per liter (ug/L), had lead concentrations trending higher.

The lead compliance goal under the Lead and Copper Rule (LCR) is to not exceed the lead action level of 15 ug/L in at least 90% of the samples taken. This is determined by comparing the 90th percentile concentration (e.g., the 90th highest value out of 100 results) to the lead action level. The last two rounds of compliance monitoring that the MDEQ had Flint conduct had the 90th percentile concentrations below the lead action level. The round of samples taken from July 2014 to December 2014 had a 90th percentile value of 6 ug/L. The last round of samples taken from January 2015 to June 2015 had a 90th percentile value of 11 ug/L. Public notice is provided when the action level is exceeded.

Even if public notice is not required, the LCR requires that homeowners whose water was sampled for lead by the water system receive a copy of their individual lead results, including an explanation of health effects and steps the consumer can take to reduce lead exposure from drinking water. EPA and the Centers for Disease Control and Prevention believe there is no safe level of lead exposure. Lead is harmful to health, especially for children. While paint, dust, and soil are the most common sources of lead, drinking water can contribute 20 to 40 percent of an

infant's lead exposure. Lead is typically not found in a utility's source water. It comes from pipes and fixtures, some of which is the owned by the homeowner. Therefore, it is difficult to say with certainty what the lead levels are in each home. The goal is to remove as much lead from drinking water as possible.

EPA promotes a number of options to reduce the amount of lead in the drinking water.

- Have your water tested. The water system will test drinking water for residents upon request.
- Be aware of any work that could disturb your lead service line, such as water main replacement, lead service line repair or replacement of part of the service line.
- Run water before use if it has not been used for several hours. The amount of time to run the water will depend on whether the home has a lead service line or not.
- Use only cold water for drinking, cooking, and preparing baby formula.
- Purchase a water filter that is certified to remove "total lead."
- On a regular basis clean and remove any debris from faucet aerators to clear out any particles of lead that may become trapped in the aerator.
- Purchase lead-free faucets and plumbing components.
- Remove the entire lead service line.

The compliance monitoring conducted by Flint also shows that they do not have optimized corrosion control and they should implement treatment as soon as possible. To help with the implementation of corrosion control treatment, EPA has offered and Flint has accepted technical assistance from EPA's Office of Research and Development experts on lead and water distribution systems to compliment the expertise of MDEQ field staff.

In addition to assisting on needed treatment for Flint's water system, EPA is currently evaluating Flint's compliance with the LCR. We are working with our legal counsel to confirm our interpretation of the LCR regulations regarding maintaining optimum corrosion control treatment. Also, EPA is reviewing the latest round of lead compliance monitoring conducted by Flint to see if all of the relevant samples have been included in the 90th percentile compliance calculation. We will provide you with the results of our evaluation when it is completed.

Again, thank you for your letter. If you have further questions, please contact me, or your staff may contact Denise Fortin, the Region 5 Congressional Liaison, at (312) 886-3000.

Sincerely,

Susan Hedman
Regional Administrator

cc: Catherine Davis – OCIR-CA-WPTT
Office of Water

DRAFT

Rennaker, Joanne (DEQ)

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

Steve,

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

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

Richard

Meeting/ Policy Briefing Template

Policy or Meeting Topic**Staff Lead**

(This is the person the Governor can email/ call with questions)

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

EO:

Dept:

Legislature:

Outside Interest:

Current Press/ Communications**Executive Summary****Background/ Attachments****Background of the Lead/Copper Regulations for Drinking Water and the city of Flint**

The U.S. EPA promulgated a treatment technique rule for control of lead and copper (Lead/Copper Rule or LCR) in drinking water in 1991. The purpose of this rule was to control the corrosive properties of drinking water to minimize the amount of lead and copper that would dissolve in the water and be transported to the customer. As such, the monitoring scheme was based upon sampling a statistically significant number of residences containing leaded plumbing materials as a measure of successful water treatment efficacy. The monitoring scheme was not intended to represent human intake, and health studies undertaken in recent years do not show a direct correlation between water sampling results and the blood lead concentrations measured in children.

The LCR also recognized that the primary source of lead exposure is not from drinking water. The largest sources of lead exposure are from lead containing dust in homes that have lead paint and from

Meeting/ Policy Briefing Template

lead contaminated soils along major traffic arteries where deposition of automobile exhaust historically occurred when gasoline contained lead. Furthermore, the primary sources of lead in drinking water are plumbing materials containing lead that are not under the control or ownership of the public water system. The LCR is an attempt to reduce the leaching of lead (and copper) from these plumbing materials.

During the twenty-five years of implementation of the LCR, some requirements have been declared unconstitutional; EPA has revised the regulation (in 2000) and provided hundreds of pages of guidance; states have had to make several implementation adjustments to make it function successfully; and most recently, EPA created a LCR Workgroup under the National Drinking Water Advisory Council (NDWAC) to provide recommendations for further LCR modifications. This workgroup just issued their final report that is now being studied by EPA, states and the regulated community. The LCRWG specifically recommends that EPA revise the LCR to require proactive lead service line replacement programs, strengthen optimal corrosion control treatment (OCCT), modify monitoring requirements, and establish a health-based household action level for lead, among others.

It is noteworthy that the LCRWG report did not include a recommendation to change the sampling protocol despite industry wide recognition of the challenging aspect of relying upon nonprofessional homeowners to conduct compliance monitoring as well as concerns that have been voiced about capturing representative exposure levels. The next step will depend upon EPA, which must now promulgate revised federal regulations if they wish to implement any of these recommendations.

Despite the LCR shortcomings, MDEQ compliance data show significant reductions in drinking water lead levels have been achieved through a combination of the following lead control initiatives:

- corrosion control treatment;
- removal of lead in plumbing systems and plumbing products;
- reduction of lead content in plumbing materials;
- lead service line replacements;
- revision of electrical grounding codes; and
- application of flushing principles by informed consumers in high risk locations.

As for Flint, the city has never exceeded the lead action level, either as a customer of Detroit or as an independent system for the year and a half. However, after switching sources (Lake Huron to the Flint River) and treatment methods (chemical softening of the river) in early 2014, the city conducted two 6-month rounds of full monitoring to determine if they were providing OCCT. When the results of the second round were available this past July, the 90th percentile value was calculated. While the city was in compliance with the action level of 15 parts per billion of lead, the city's 90th percentile values for both rounds were above the level of 5 parts per billion at which they could be deemed optimal.

Under the regulatory framework, the city would have as much as 2 years to study, recommend and install OCCT. As a result of the adverse publicity, they are accelerating plans to install OCCT before the end of 2015. Complicating matters are the plans for the city to switch sources again in 2016 when they will be connected to a new 60-mile pipeline from Lake Huron, at which time the current intake in the Flint River will return to a standby mode. When this next switch occurs, the city will be required to continue OCCT, and another two rounds of full monitoring will again be conducted by the city.

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Finally, the LCRWG report acknowledged certain concepts underlie their recommendations for possible revisions to the LCR. The following list contains some of these concepts that seem particularly pertinent in Flint:

- There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for pregnant woman, infants and children with both acute and chronic exposures.
- Lead-bearing plumbing materials in contact with drinking water pose a risk at all times, not just when there is a lead action level (LAL) exceedance.
- The presence of lead-bearing materials in premise plumbing raises issues about what systems can implement in customers' homes.
- Effective elimination of leaded materials in contact with water and minimization of exposure to lead in drinking water is a shared responsibility. PWSs, consumers, building owners, public health officials and others each have important roles to play.
- Proactive action is needed to remove the sources of lead, with appropriate incentives both for PWSs and their customers needed to encourage such action.
- Creative financing mechanisms also will be needed to achieve this goal for all individuals potentially exposed to lead, regardless of race, ethnicity or income. Leaving a lead service line in place because a low-income resident does not have the means to pay raises serious questions of disparate impact and environmental justice.
- The public plays a critical role in protecting their families' health by reducing exposure to lead and copper, and informing the public enables them to be effective participants in implementing their share of the responsibility.

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Wednesday, September 30, 2015 8:41 AM
To: Busch, Stephen (DEQ)
Subject: Flint Briefing - Draft 9-30-2015.dotx
Attachments: Flint Briefing - Draft 9-30-2015.dotx.docx

Here are my suggested edits. I really liked the last section where I inserted several key bullet points from the NDWAC WG report that reiterate why this issue is not just a Flint issue, but if you think that adding that material will detract from the briefing by adding too much length, we can find other vehicles for that message.

I hope to contact Kris Donaldson today and get the last few lead service line counts from SE MI and finish that document.

Richard

Meeting/ Policy Briefing Template

Policy or Meeting Topic

City of Flint and Lead Concerns in Customer Tap Water

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

EO:

Dept:

Legislature:

Outside Interest:

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

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

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

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

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- Taking further steps to optimize their corrosion control treatment. ~~W-(for water systems serving 50,000 or more people are required to that have not provide fully optimized their corrosion control treatment (OCCT) regardless of their tap monitoring results.~~
- Educating the public about lead in drinking water and possible actions consumers can take to reduce their exposure to lead.
- Replacing the portions of lead service lines under the water system's control if ongoing lead AL exceedance occurs following implementation of ~~optimized corrosion control treatment (OCCT).~~

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

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

OCCT will help minimize, but cannot eliminate lead exposure from customer tap water. Removal of lead materials is the only means to eliminate such exposure. However, replacement is a shared responsibility between the City and its customers, as research has shown that only replacing the city's portion of a partial lead service line replacement can increase rather than decrease lead exposure. At an estimated average cost of \$4,000 to replace each service line, the total cost in Flint to complete such work could easily exceed \$60 million and would likely take many years to complete. At this time, any effort by the City of Flint to replace lead service lines would be voluntary since the City continues to comply with the LCR lead AL of 15 ppb.

In addition, it is widely recognized that drinking water is not a primary source of lead exposure and poisoning. Recent health studies show no direct correlation between water sampling results and blood lead level concentrations measured in children. (do we need to cite where we obtained this fact?)

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

Rennaker, Joanne (DEQ)

From: Feuerstein, Heather (DEQ)
Sent: Wednesday, November 04, 2015 5:23 PM
To: Busch, Stephen (DEQ); Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Subject: Freeman Elementary Sample-Assessment-Recommendations-Draft 11-4-15.docx
Attachments: Freeman Elementary Sample-Assessment-Recommendations-Draft 11-4-15.docx

This includes Karen T's edits. Steve I put in red text where we need you to fill in the blank.

**Freeman Elementary School
Outlet Sampling and Plumbing Assessment Recommendations**



Background Information

On Friday, October 23, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of Freeman Elementary's plumbing system to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

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

The assessment also identified 31 faucets or fountains that provide water for drinking, cooking and/or food preparation. The team developed a sequence for sampling the 31 faucets based on how the water travels through the building.

On Saturday, October 24, 2015, the DEQ and the DLARA completed sampling of the 31 faucets/fountains, in the order determined by the plumbing assessment from the previous day, following a stagnation period of 12 hours. At each of the 31 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F1) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F2) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

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On Saturday, October 31, 2015, the DEQ separately completed additional consecutive sampling at three of the 31 faucets/fountains following a stagnation period of approximately 12 hours. This sampling was used to determine the impact of any lead sources located deep in the supply plumbing. These three sites were selected based on their relative location within the school building plumbing, included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these three locations, staff collected 10, 1-liter samples. Each sample was one liter in volume, and the 10 samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between immediately after turning on the tap without letting water run down the drain. These samples were used to determine the impact of any lead sources from the larger diameter supply plumbing within the school building.

Water Service Information

A four-inch diameter cast iron water service line enters the school in the boiler room on the west wall. Piping in the boiler room immediately transitions into galvanized metal piping for cold water lines. Two separate galvanized cold water supply lines exit the boiler room. One in the northeast corner appears to serve the gym, auditorium, and proposed pre-K facilities on the north end of the school. The other exits the boiler room in the southwest corner and appears to serve the remainder of the school to the south, including the library. This line was also found to have grounding connections attached to the piping. Hot water is distributed in continuous loops that feed from and return to a central water heater in the boiler room. Hot water piping material, where exposed, was copper piping with 50/50 lead solder joints. Brass valves were seen throughout the building.

Results of for the three sites consecutive sampling sampled conducted at three sites on October 31, 2015, are listed in the table below. The results provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains themselves and not from the larger diameter supply plumbing within the school building. Results from the first one liter sample at each of these three locations sites correlate with the respective four, 125 milliliter samples collected at the same locations on October 24, 2105, with the larger one-liter volume showing a more diluted result in comparison with the smaller more concentrated 125 milliliter samples.

The continued presence of lead in samples collected at location B in Room 11 (CF015) may be a result of lead particulates caught in the aerator/screen installed on the faucet outlet, or may also be from a source of lead further back in the plumbing system. However, non-detect results from consecutive samples collected at locations A and C suggest any additional source of lead associated with location B would be localized to the plumbing branch serving this faucet. The faucet aerator/screen at location B (CF015) should be removed and inspected before completing a more in-depth plumbing analysis. Results regarding location B provide additional information regarding the specific recommendations for this faucet outlined in the following section.

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Sample No.	1	2	3	4	5	6	7	8	9	10
Location	Lead Result (parts per billion; ND = not detected)									
A-Proposed Pre-K Rm (CF030)	2	4	ND	ND	ND	ND	ND	ND	ND	ND
B-Room 11 (CF015)	62	8	8	7	7	7	7	6	6	6
C-Room 24 (CF027)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

Individual Faucets/Fountains/Outlets With Lead Levels Greater Than 15 Parts per Billion

The MDEQ recommends that school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 31 faucets/fountains on October 24, 2015, the following nine drinking water outlets had lead water level results greater than 15 parts per billion. Each of these nine outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

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Outlet: Bubbler Drinking Fountain, Left
Location: Hallway outside Janitorial Room
Results: P1=40 parts per billion, P2=6 parts per billion
 F1=4 parts per billion, F2=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to have a brass valve. The connection under the sink also appears to have some brass components including the valve at the wall.

Replacement of this bubbler tap and its connecting plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlet: Sink Faucet (CF029)
Location: DHHS Health Office, west wall
Results: P1=17 parts per billion, P2=12 parts per billion
 F1=2 parts per billion, F2= non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The faucet is a Delta 400. This model faucet valve has brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink may also contain brass components.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlet: Integrated faucet and bubbler fountain (CF006)

Location: Classroom 2, south wall

Results: P1=16 parts per billion, P2=3 parts per billion,
F1=1 part per billion, F2=1 part per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Integrated faucet and bubbler fountain (CF014)

Location: Classroom 10, north wall

Results: P1=27 parts per billion, P2=7 parts per billion,
F1=4 parts per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself and its connecting plumbing. The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple. Connecting plumbing in the cabinet under the sink may also contain brass components.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF013)

Location: Classroom 10, north wall

Results: P1=9 parts per billion, P2=18 parts per billion
F1=3 parts per billion, F2=3 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing with some contribution from the faucet itself. The faucet appears to be a Delta 500 series. This model faucet may have some brass



components.—This style faucet also has a mixing valve that may allow mixing of hot and cold water.—Connecting plumbing in the cabinet under the sink should be checked for brass components including brass valves.

This faucet also has an aerator at the outlet.—The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled.—If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location.—If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF015)

Location: Classroom 11, northeast corner

Results: P1=102 parts per billion, P2=326 parts per billion
F1=14 parts per billion, F2=11 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing and from the faucet itself.—The faucet is an older design that uses a brass tube approximately 8 inches in length between the hot and cold water valves and connects to the outlet under the sink.—This brass tube may be the primary source of lead, explaining the higher second (P2) sample result.—The faucet and valves may also contain brass components.—Connecting plumbing in the cabinet under the sink should be checked for additional brass components including brass valves.



This faucet also has an aerator at the outlet.—The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled.—If particulates are found, the aerator should be periodically checked and cleaned.

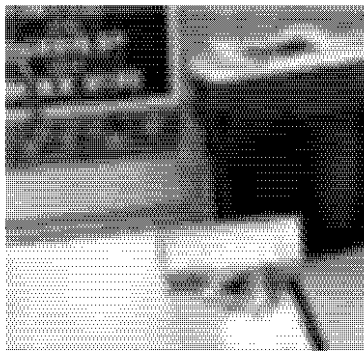
Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and needs to be completed.—If replacement is not currently feasible, **DO NOT USE THIS FAUCET FOR DRINKING OR COOKING.**

Outlet: Integrated faucet and bubbler fountain (CF024)

Location: Classroom 19, east wall

Results: P1=23 parts per billion, P2=3 parts per billion,
F1=4 parts per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself.—The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location.—If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler fountain (CF026)

Location: Classroom 14, west wall

Results: P1=36 parts per billion, P2=30 parts per billion,
F1=17 parts per billion, F2=4 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This style bubbler typically has a 4-5 inch brass fitting that connects to a 1/2 inch brass nipple on the underside of the sink. This may explain the higher concentrations in the first two samples. The connection underneath the sink may also have some brass components and should be checked, including the valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes prior to each use and for at least 4 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure. In general, use of this fountain for drinking water should be discouraged.

Outlet: Bubbler fountain (CF031)

Location: Proposed Pre-K room, south wall

Results: P1=57 parts per billion, P2=3 parts per billion,
F1=2 parts per billion, F2=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This bubbler has a brass fitting connection to a brass nipple. The connector hose is not expected to be contributing lead.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlets-Individual Faucets/Fountains With Lead Levels 15 Parts per Billion or Less

While the remaining 22 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

Several 12 of these outlets are comprised of similar materials as the outlets listed above, and could potentially experience higher lead levels under extended periods of stagnation. -- These faucets/fountains include:

This includes:

- Sink Side Bubbler Units in Room 12 (CF022), Room 5 (CF009), Room 21 (CF028), Hallway Fountain (DW002), Room 15 (CF018), Room 17 (CF020), and Room 1 (DW005).
- Integrated Faucet Bubbler Fountain Units in Room 6 (CF010), Room 9 (CF012), Room 4 (CF008), Room 3 (CF007), and Room 7 (CF011)

Replacement of these fixtures with lead-free materials is also recommended.

The remaining 10 outlets did not demonstrate any lead results higher than 15 ppb and are not made of similar materials to the nine outlets with elevated lead results. These faucets/fountains include: **Steve please fill in this information.**

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The fourth sample at each of these 22 outlets following approximately three 3 minutes of use and flushing at a reduced flow reduced lead concentrations to 4 parts per billion or less. -- This indicates that flushing of all taps used for drinking, cooking, and/or food preparation, for 4 minutes following periods of stagnation will further reduce lead exposure. -- It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance.

Results from Consecutive Additional Testing Taken Conducted to Find Search for Potential Sources of Lead Deeper in the Plumbing

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The 30 additional samples taken at three sites in the building on October 31, 2015, provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the school building.

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Sample No.	1	2	3	4	5	6	7	8	9	10
Location	Lead Result (parts per billion; ND = not-detected)									
Proposed Pre-K Rm (CF030)	2	1	ND	ND	ND	ND	ND	ND	ND	ND
Room 11 (CF015)	62	8	8	7	7	7	7	6	6	6
Room 21 (CF027)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

The continued presence of lead in samples collected in Room 11 (CF015) may be a result of lead particulates caught in the aerator/screen installed on the faucet outlet, or may be from a source of lead further back in the plumbing system. However, the non-detect results from consecutive samples collected in Proposed Pre-K Room (CF030) and Room 21 (CF027) suggest any additional source of lead associated with Room 11 (CF015) is localized to the plumbing branch serving this faucet. The faucet aerator/screen in Room 11 (CF015) should be removed and inspected before completing a more in-depth plumbing analysis.

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DRAFT

Rennaker, Joanne (DEQ)

From: Feuerstein, Heather (DEQ)
Sent: Thursday, November 05, 2015 11:11 AM
To: Busch, Stephen (DEQ)
Subject: Freeman Elementary Sample-Assessment-Recommendations-Draft 11-5-15 (2).docx
Attachments: Freeman Elementary Sample-Assessment-Recommendations-Draft 11-5-15 (2).docx

Steve,

Can you please take a look at the highlights on this. When you say "consecutive" do you mean "let no water run in between samples collected" or do you mean sampling conducted after the original October 24th sampling event???

**Freeman Elementary School
Outlet Sampling and Plumbing Assessment Recommendations**



Background Information

On Friday, October 23, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of Freeman Elementary's plumbing system to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

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

The assessment also identified 31 faucets or fountains that provide water for drinking, cooking and/or food preparation. The team developed a sequence for sampling the 31 faucets/fountains based on how the water travels through the building.

On Saturday, October 24, 2015, the DEQ and the DLARA completed sampling of the 31 faucets/fountains, in the order determined by the plumbing assessment from the previous day, following a stagnation period of 12 hours. At each of the 31 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F1) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F2) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

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On Saturday, October 31, 2015, the DEQ separately completed consecutive sampling at three of the 31 faucets/fountains following a stagnation period of approximately 12 hours. This sampling was used to determine the impact of any lead sources located deep in the supply plumbing. These three sites were selected based on their relative location within the school building plumbing: included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these three locations, staff collected 10, 1-liter samples. Each sample was one liter in volume, and the 10 samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between immediately after turning on the tap without letting water run down the drain. These samples were used to determine the impact of any lead sources from the larger diameter supply plumbing within the school building.

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Water Service Information

A four-inch diameter cast iron water service line enters the school in the boiler room on the west wall. Piping in the boiler room immediately transitions into galvanized metal piping for cold water lines. Two separate galvanized cold water supply lines exit the boiler room. One in the northeast corner appears to serve the gym, auditorium, and proposed pre-K facilities on the north end of the school. The other exits the boiler room in the southwest corner and appears to serve the remainder of the school to the south, including the library. This line was also found to have grounding connections attached to the piping. Hot water is distributed in continuous loops that feed from and return to a central water heater in the boiler room. Hot water piping material, where exposed, was copper piping with 50/50 lead solder joints. Brass valves were seen throughout the building.

Results of for the three sites consecutive sampling sampled conducted at three sites on October 31, 2015, are listed in the table below. The results provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains themselves and not from the larger diameter supply plumbing within the school building. Results from the first one liter sample at each of these three locations sites correlate with the respective four, 125 milliliter samples collected at the same locations on October 24, 2015, with the larger one liter volume showing a more diluted result in comparison with the smaller more concentrated 125 milliliter samples.

The continued presence of lead in samples collected at location B in Room 11 (CF015) may be a result of lead particulates caught in the aerator/screen installed on the faucet outlet, or may also be from a source of lead further back in the plumbing system. However, non-detect results from consecutive samples collected at locations A and C suggest any additional source of lead associated with location B would be localized to the plumbing branch serving this faucet. The faucet aerator/screen at location B (CF015) should be removed and inspected before completing a more in depth plumbing analysis. Results regarding location B provide additional information for the school outlined as follows:

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Sample No:	4	2	3	4	5	6	7	8	9	10
Location	Lead Result (parts per billion; ND = not detected)									
A Proposed Pre-K Rm (CF030)	2	4	ND	ND	ND	ND	ND	ND	ND	ND
B Room 11 (CF015)	62	8	8	7	7	7	7	6	6	6
C Room 21 (CF027)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

Outlets With Lead Levels Greater Than 15 Parts per Billion

The MDEQ recommends that school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 31 faucets/fountains on October 24, 2015, the following nine drinking water outlets had lead water level results greater than 15 parts per billion. Each of these nine outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

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Outlet: Bubbler Drinking Fountain, Left (DW00)

Location: Hallway outside Janitorial Room

Results: P1=40 parts per billion, P2=6 parts per billion
F1=4 parts per billion, F2=1 part per billion

These results suggest the highest contribution of lead is from the bubbler itself. This bubbler fixture is believed to have a brass valve. The connection underneath the sink also appears to have some brass components including the valve at the wall.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

**Outlet: Sink Faucet (CF029)**

Location: DHHS Office, west wall

Results: P1=17 parts per billion, P2=12 parts per billion
F1=2 parts per billion, F2= non-detect

These results suggest the highest contribution of lead is from the faucet and its connecting plumbing. The faucet is a Delta 400. This model faucet valve has brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connection plumbing in the cabinet under the sink may also contain brass components.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlet: Integrated faucet and bubbler fountain (CF006)

Location: Classroom 2, south wall

Results: P1=16 parts per billion, P2=3 parts per billion,
F1=1 part per billion, F2=1 part per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Integrated faucet and bubbler fountain (CF014)

Location: Classroom 10, north wall

Results: P1=27 parts per billion, P2=7 parts per billion,
F1=4 parts per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself and its connecting plumbing. The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple. Connecting plumbing in the cabinet under the sink may also contain brass components.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF013)

Location: Classroom 10, north wall

Results: P1=9 parts per billion, P2=18 parts per billion
F1=3 parts per billion, F2=3 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing with some contribution from the faucet itself. The faucet appears to be a Delta 500 series. This model faucet may have some brass



components.—This style faucet also has a mixing valve that may allow mixing of hot and cold water.—Connecting plumbing in the cabinet under the sink should be checked for brass components including brass valves.

This faucet also has an aerator at the outlet.—The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled.—If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location.—If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF015)

Location: Classroom 11, northeast corner

Results: P1=102 parts per billion, P2=326 parts per billion
F1=14 parts per billion, F2=11 parts per billion

These results suggest the highest contribution of lead from the connecting plumbing and from the faucet itself. The faucet is an older design that uses a brass tube approximately 8 inches in length between the hot and cold water valves that connects to the outlet under the sink.—This brass tube may be the primary source of lead, explaining the higher second (P2) sample result.—The faucet and valves may also contain brass components.—Connecting plumbing in the cabinet under the sink should be checked for additional brass components, including brass valves.



This faucet also has an aerator at the outlet.—The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled.—If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and needs to be completed.—If replacement is not currently feasible, **DO NOT USE THIS FAUCET FOR DRINKING OR COOKING.**

Outlet: Integrated faucet and bubbler fountain (CF024)

Location: Classroom 19, east wall

Results: P1=23 parts per billion, P2=3 parts per billion,
F1=4 parts per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself.—The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location.—If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler fountain (CF026)

Location: Classroom 14, west wall

Results: P1=36 parts per billion, P2=30 parts per billion,
F1=17 parts per billion, F2=4 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This style bubbler typically has a 4-5-inch brass fitting that connects to a 3-inch brass nipple on the underside of the sink. This would explain the higher concentrations in the first two sample results. The connection underneath the sink may also have some brass components and should be checked including the valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes prior to each use and for at least 4 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure. **In general, use of this fountain for drinking water should be discouraged.**

Outlet: Bubbler fountain (CF031)

Location: Rainbow Pre-K Room, south wall

Results: P1=57 parts per billion, P2=3 parts per billion,
F1=2 parts per billion, F2=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This bubbler has a brass fitting connection to a brass nipple. The connector hose is not expected to be contributing lead.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 22 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

The fourth sample at each of these 22 outlets following approximately three 3 minutes of use and flushing at a reduced flow reduced lead concentrations to 4 parts per billion or less.— This indicates that flushing of all taps used for drinking, cooking, and/or food preparation, for 4 minutes following periods of stagnation will further reduce lead exposure.— It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance

Several Twelve of these outlets are comprised of similar materials as the outlets listed above, and could potentially experience higher lead levels under extended periods of stagnation.

These faucets/fountains include:

This includes:

- Sink Side Bubbler Units in Classroom 12 (CF022), Classroom 5 (CF009), Classroom 21 (CF028), Hallway Fountain (DW002), Classroom 15 (CF018), Classroom 17 (CF020), and Classroom 1 (DW005).
- Integrated Faucet Bubbler Fountain Units in Classroom 6 (CF010), Classroom 9 (CF012), Classroom 4 (CF008), Classroom 3 (CF007), and Classroom 7 (CF011).

Replacement of these fixtures with lead-free materials is also recommended.

~~The remaining 10 outlets did not showed sample demonstrate any lead results of 15 parts per billion or less, higher than 15 ppb and requiring no further action or additional recommendations are not made of similar materials to the nine outlets with elevated lead results. These faucets/fountains include: Steve please fill in this information:~~

- Sink Faucets in Classroom 1 (CF004), Classroom 15 (CF017), Classroom 17 (CF019), Classroom 12 (CF021), Classroom 19 (CF023), Classroom 14 (CF025), Classroom 21 (CF027), Rainbow Pre-K Room (CF030).
- Kitchen Sink (cold) in the Community Room (KC003).
- Sink Side Bubbler Fountain in Classroom 11 (CF016).

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Consecutive Sampling Results and Building Plumbing Recommendations

The 30 consecutive samples taken at three sites in the building on October 31, 2015, provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the school building.

Consecutive Sample No.	1	2	3	4	5	6	7	8	9	10
Location	Lead Result (parts per billion; ND = not-detected)									
Rainbow Pre-K Rm Sink Faucet (CF030)	2	1	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 11 Sink Faucet (CF015)	62	8	8	7	7	7	7	6	6	6
Classroom 21 Sink Faucet (CF027)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

The continued presence of lead in samples collected at Classroom 11 (CF015) may be a result of lead particulates caught in the aerator/screen installed on the faucet outlet, or may be from a source of lead further back in the plumbing system. However, the non-detect results from consecutive samples collected in Rainbow Pre-K Room (CF030) and Classroom 21 (CF027) suggest any additional source of lead associated with Classroom 11 (CF015) is localized to the plumbing branch serving this faucet. The faucet aerator/screen in Classroom 11 (CF015) should be removed and inspected before completing a more in-depth plumbing analysis. Consecutive sampling results at Classroom 11 (CF015) support the water use restrictions specified for this outlet.

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Rennaker, Joanne (DEQ)

From: Feuerstein, Heather (DEQ)
Sent: Thursday, October 29, 2015 4:58 PM
To: Busch, Stephen (DEQ)
Subject: Freeman Elementary Sample-Assessment-Recommendations-Draft v3.docx
Attachments: Freeman Elementary Sample-Assessment-Recommendations-Draft v3.docx

Here is the Word version.

**Freeman Elementary School
Outlet Sampling and Plumbing Assessment Recommendations**



Background Information

On Friday, October 23, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of Freeman Elementary's plumbing system to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

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

The assessment also identified 31 faucets or fountains that provide water for drinking, cooking and/or food preparation. The team developed a sequence for sampling the 31 faucets based on how the water travels through the building.

On Saturday, October 24, 2015, the DEQ and the DLARA completed sampling of the 31 faucets/ fountains, in the order determined by the plumbing assessment from the previous day, following a stagnation period of 12 hours. At each of the 31 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F1) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F2) was collected.

Water Service Information

A four inch diameter cast iron water service line enters the school in the boiler room on the west wall. Piping in the boiler room immediately transitions into galvanized metal piping for cold water lines. Two separate galvanized cold water supply lines exit the boiler room. One in the northeast corner appears to serve the gym, auditorium, and proposed pre-K facilities on the north end of the school. The other exits the boiler room in the southwest corner and appears to serve the remainder of the school to the south, including the library. This line was also found to have grounding connections attached to the piping. Hot water is distributed in continuous loops that feed from and return to a central water heater in the boiler room. Hot water piping material where exposed was copper piping with 50/50 lead solder joints. Brass valves were seen throughout the building.

Outlets With Lead Levels Greater Than 15 Parts per Billion

Outlet: Bubbler Drinking Fountain, Left (DW001)

Location: Hallway outside Janitorial Room

Results: P1=40 parts per billion, P2=6 parts per billion
F1=4 parts per billion, F2=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is believed to have a brass valve. The connection underneath the sink also appears to have some brass components including the valve at the wall.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlet: Sink Faucet (CF029)

Location: DHHS Health Office, west wall

Results: P1=17 parts per billion, P2=12 parts per billion
F1=2 parts per billion, F2= non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The faucet is a Delta 400. This model faucet valve has brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink may also contain brass components.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlet: Integrated faucet and bubbler fountain (CF006)

Location: Classroom 2, south wall

Results: P1=16 parts per billion, P2=3 parts per billion,
F1=1 part per billion, F2=1 part per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Integrated faucet and bubbler fountain (CF014)

Location: Classroom 10, north wall

Results: P1=27 parts per billion, P2=7 parts per billion,
F1=4 parts per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself and its connecting plumbing. The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple. Connecting plumbing in the cabinet under the sink may also contain brass components.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF013)

Location: Classroom 10, north wall

Results: P1=9 parts per billion, P2=18 parts per billion
F1=3 parts per billion, F2=3 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing with some contribution from the faucet itself. The faucet appears to be a Delta 500 series. This model faucet may have some brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink should be checked for brass components including brass valves.



This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

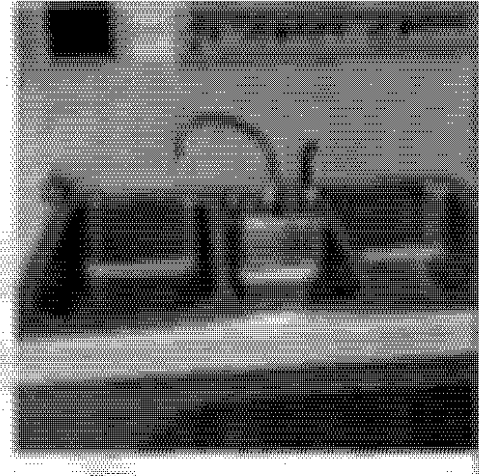
Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF015)

Location: Classroom 11, northeast corner

Results: P1=102 parts per billion, P2=326 parts per billion,
F1=14 parts per billion, F2=11 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing and from the faucet itself. The faucet is an older design that uses a brass tube approximately 8 inches in length between the hot and cold water valves, and connects to the outlet under the sink. This brass tube may be the primary source of lead, explaining the higher second (P2) sample result. The faucet and valves may also contain brass components. Connecting plumbing in the cabinet under the sink should be checked for additional brass components including brass valves.



This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and needs to be completed. If replacement is not currently feasible, **DO NOT USE THIS FAUCET FOR DRINKING OR COOKING.**

Outlet: Integrated faucet and bubbler fountain (CF024)

Location: Classroom 19, east wall

Results: P1=23 parts per billion, P2=3 parts per billion,
F1=4 part per billion, F2=3 parts per billion

These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.



Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler fountain (CF026)

Location: Classroom 14, west wall

Results: P1=36 parts per billion, P2=30 parts per billion,
F1=17 parts per billion, F2=4 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This style bubbler typically has a 4-5 inch brass fitting that connects to a 3 inch brass nipple on the underside of the sink. This would explain the higher concentrations in the first two sample results. The connection underneath the sink may also have some brass components and should be checked including the valve.



Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes prior to each use and for at least 4 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure. **In general, use of this fountain for drinking water should be discouraged.**

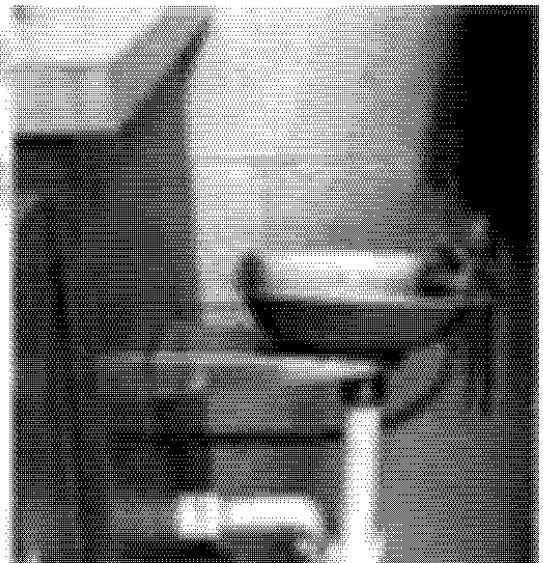
Outlet: Bubbler fountain (CF031)

Location: Proposed Pre-K room, south wall

Results: P1=57 parts per billion, P2=3 parts per billion,
F1=2 parts per billion, F2=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This bubbler has a brass fitting connection to a brass nipple. The connector hose is not expected to be contributing lead.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.



Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 22 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

Several of these outlets are comprised of similar materials as the outlets listed above, and could potentially experience higher lead levels under extended periods of stagnation.

This includes:

- Sink Side Bubbler Units in Room 12 (CF022), Room 5 (CF009), Room 21 (CF028), Hallway Fountain (DW002), Room 15 (CF018), Room 17 (CF020), and Room 1 (DW005).
- Integrated Faucet Bubbler Fountain Units in Room 6 (CF010), Room 9 (CF012), Room 4 (CF008), Room 3 (CF007), and Room 7 (CF011)

Replacement of these fixtures with lead-free materials is also recommended.

The fourth sample at each of these 22 outlets following approximately three minutes of use and flushing at a reduced flow reduced lead concentrations to 4 parts per billion or less. This indicates that flushing of all taps used for drinking, cooking, and/or food preparation, for 4 minutes following periods of stagnation will further reduce lead exposure. It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 09, 2015 4:03 PM
To: Poy, Thomas; Dykema, Linda D. (DHHS); Madziar, Joseph (LARA)
Cc: Cook, Pat (DEQ); Sygo, Jim (DEQ); Tommasulo, Karen (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ)
Subject: FW: Draft Deliberative Not Subject to FOIA
Attachments: Working Draft - Collecting Water Samples at Schools 10_9_15.docx

Attached is a working draft of a protocol for sampling schools, including information on the plumbing assessment.

Please provide comments by COB Monday. If you have questions, Pat will be around on Monday, but gone after that for a couple of days.

This is only a segment/portion of the larger document that will include further information, discussion regarding decision-making and strategies for short term and longer term actions.

From: Cook, Pat (DEQ)
Sent: Friday, October 09, 2015 3:49 PM
To: Shekter Smith, Liane (DEQ)
Subject: Draft Deliberative Not Subject to FOIA

Liane - please find attached a draft of the sampling procedures for schools.

If you need anything else, please let me know.

I'll see you on Monday.

pat

Patrick Cook, P.E.
 Community Drinking Water Unit
 Office of Drinking Water & Municipal Assistance
 Michigan Department of Environmental Quality
 Phone: (517) 284-6514
cookp@michigan.gov

DRAFT – WORK IN PROGRESS

Protocol for Collecting Water Samples at Schools for Lead Analysis

The following is a detailed, step-by-step procedure to ensure samples are collected in a systematic, consistent manner to provide meaningful results. By following the below procedures school and health officials will have information to be able to identify and correct any sources that contribute lead into drinking water. The recommended procedures are:

- With the assistance from Department of Licensing and Regulatory Affairs (LARA) staff, conduct an on-site assessment of the building plumbing to prioritize sample sites.
- School staff collects the samples from prioritized sites and in the sequence recommended by LARA.
- School staff submits the samples and appropriate paperwork to the DEQ certified drinking water laboratory
- Laboratory performs analysis and informs DEQ-ODWMA staff of the results.
- DEQ informs DHHS of test results, and they jointly interpret the results.
- DHHS staff relays the results to school officials and confers on any follow-up or corrective remedies that may be needed.

Step 1 – Prepare for On-Site Assessment

In order to assist LARA staff to identify and prioritize sample sites, school staff should compile, collect, and review any records pertaining to the building plumbing. This includes building permits, plumbing permits, as built plans, and information about the service line and all potable water pipes, fixtures and appurtenances within the building. At a minimum, a diagram of each floor layout should be provided. In addition, answers to the following questions will help streamline the on-site assessment process.

- When was the facility built?
- Have new buildings or additions been added? If so, when were they added? If built since 1986, were lead-free plumbing and solder used?
- When were the most recent plumbing repairs made and where were they located?
- What are the potable water pipes in your facility made of and what is their location? Options include: lead, brass, copper, plastic, galvanized metal and other materials. What materials were used to solder the potable water pipes in your system? Are brass taps, fittings or valves used? Note the locations.
- How many of the following outlets provide water for consumption: Bubblers, ice makers, water coolers and kitchen taps. Note their location. Include taps that might be used for making coffee or preparing formula.
- What brands and models of water coolers (cooled drinking fountains) provide water in your facility and what is their location?
- Do faucets have accessible screens and have they been cleaned?
- Can you detect any signs of corrosion, such as leaks, rust-colored water or stains?
- Is any electrical equipment grounded to water pipes?

- Are there any records of previous water testing?

Step 1 – Arrange for On-site Assessment with LARA Staff

LARA staff will contact school officials/staff and set a date and time for the assessment. A school representative familiar with the building layout and plumbing system needs to accompany LARA staff as they conduct the assessment. A room reserved for records review should also be available.

Step 3 – Prioritize Sample Sites and Sampling Sequence

It is recommended that all faucets, taps and outlets that are used regularly by students and staff for drinking, cooking, making coffee or food preparation will be sampled. High priority sites would include:

- Drinking Fountains (both bubblers and water cooler style).
- Kitchen Sinks, faucets or taps.
- Breakroom, classroom, teachers' lounge or other sinks known to be or visibly used for consumption (water glasses or coffeemaker and/or cups are nearby).
- Bottled Water Dispensers
- Ice Makers

LARA staff will assign a sample site Identification (ID) number for each sample site and the order in which each site is to be sampled. This number will reflect the type of tap/outlet and location. Sites closest to the service line are to be collected first, then in a sequence as they get farther from the service line until the site the farthest away is sampled last. This will minimize the chance that the piping is not flushed by a downstream or other sample location prior to collecting the samples at that site.

Step 4 – Collect the Samples

After the sites and order of collection have been determined by LARA staff, the samples can be collected by school staff. While not a requirement, it is highly recommended that the samples be collected by someone with experience in water sample collection. In addition, make sure to inform all other staff including teachers, maintenance staff, parents and students of the sampling plans.

1. Three samples will be collected from each designated sample site. Therefore, obtain three, 125 milliliter (ml) sample containers for each sample site from the DEQ laboratory.
2. Collect all water samples before the building opens and before any water is used. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is collected.
3. Do not collect samples in the morning after a vacation, weekend or holiday. These results will likely be higher because of the extended contact time with the water.
4. The three samples from each site are to be collected at first draw, after a 30 second flush, and a 2 minute flush as follows:
 - a. After the appropriate 8 - 18 stagnation time, place the first bottle under the tap, open the tap to produce a slow, steady "pencil thin" flow and fill the bottle to the appropriate level.
 - b. 30 seconds after filling the first bottle, fill the second bottle.
 - c. 2 minutes after filling the second bottle, fill the third bottle.

5. Make sure to not turn the faucet off or adjust the flow between samples.
6. Make sure to mark the bottles as "first draw", "30 sec flush" or "2 min flush" and also indicate this information on the sample submission form.
7. Assign an appropriate sample Identification (ID) number to each sample collected. Record this number (including the flush time) on the sample container and submission form.
8. Collect the remainder of the samples from all designated sites in the pre-determined order as recommended by LARA.
9. Deliver or ship the samples to the lab as instructed.

Step 5 - Laboratory performs analysis and informs DEQ – ODWMA staff of the results

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, September 02, 2015 3:09 PM
To: Wurfel, Brad (DEQ)
Cc: Benzie, Richard (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!
Attachments: Editorial response to Virginia Tech testing Flint homes for lead.doc

Here's a revised version. The track changes make it difficult to read. Can't seem to make it go away though. We suggest you open it and then go to the Review tab and then next to Track Changes, select "Final" from the pick list in the drop down box.

Also, if you haven't opened the note I sent earlier, DHHS has a website with great lead information. <http://www.michigan.gov/lead/0,5417,7-310-65933-308641--,00.html>
 This is their Childhood Lead Poisoning Prevention Program.

From: Wurfel, Brad (DEQ)
Sent: Wednesday, September 02, 2015 12:12 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!

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

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

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

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

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

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

From: Ronald Fonger [<mailto:RFONGER1@mlive.com>]
Sent: Wednesday, September 02, 2015 11:34 AM
To: Wurfel, Brad (DEQ)
Cc: Kristin Longley; Bryn Mickle
Subject: lead in flint water

Brad:

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

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

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

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

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

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

Could you let me know who that is?

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

Thanks,

Ron Fonger
MLive Media Group
Reporter

mobile 810.347.9963

email rfonger1@mlive.com

address 540 S. Saginaw St. #101, Flint MI 48502

We are aware that Virginia Tech researchers are now testing water at various Flint homes for lead levels in their plumbing. We appreciate that Virginia Tech's team is working on this issue because it brings the public spotlight on an important fact: if you have lead water pipes or plumbing fixtures containing lead in your home, or a lead service connection to the city system, it is very likely you are ingesting some level of lead. That's just a fact, and in the City of Flint, that fact affects 15,000 or more residences.

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

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

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

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

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

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, November 03, 2015 3:23 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)
Subject: FW: DRAFT TIMELINE
Attachments: Draft Flint Drinking Water Events Timeline 11-3-15.docx

For your review/changes/comments.

The plan is to attach supporting documentation as Attachments.

From: Devereaux, Tracy Jo (DEQ)
Sent: Tuesday, November 03, 2015 2:07 PM
To: Shekter Smith, Liane (DEQ)
Subject:

Edited.

Thanks,

Tracy Jo

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, November 03, 2015 1:20 PM
To: Devereaux, Tracy Jo (DEQ)
Subject:

Could you please improve the formatting? Thanks.

FLINT DRINKING WATER EVENTS TIMELINE

Date	Event	Attachment
Pre-1967	Flint Water Treatment Plant in operation using Flint River (see Flint Brochure)	
Post-1967	Flint switched to DWSD for drinking water	
Mid-2000s	Discussions began regarding Karegnondi Water Authority	
2009	KWA Report (need title)	
2011	Analysis of the Flint River as a Permanent Water Supply for the City of Flint; Prepared for: City of Flint. (Provided to DEQ March 2013)	
April 2013	Flint notifies DWSD of contract discontinuation and joins the Karegnondi Water Authority	
April 2013	DWSD sets termination of Flint water service contract to April 17, 2014	
June 2013	Karegnondi Water Authority groundbreaking	
	Add Construction Permits here	
June 2013	Flint notifies DEQ of intent to use of Flint Water Treatment Plant full time with Flint Water	
May 2014	Flint stops purchasing DWSD water. Starts using the City of Flint WTP and Flint River	
Aug 2014	Flint E.Coli Bacteria violation, Localized System Boil Water Advisory	
Aug 2014	Disinfection Byproducts, DEQ requests preemptive Operational Evaluation	
Sept 2014	Flint Total Coliform Bacteria violation, Localized System Boil Water Advisory	
Oct 2014	General Motors announces decision to stop using Flint water	
Nov 2014	Disinfection Byproducts violation begins	

FLINT DRINKING WATER EVENTS TIMELINE

Date	Event	Attachment
Jan 2015	1st 6-month lead and copper sampling completed 100 samples, 90th% = 6 ppb	
January 21, 2015	City of Flint Public Meeting	
February 26, 2015	E-mail from EPA regarding one high lead sample.	
February 27, 2015	E-mail from EPA inquiring about Optimized Corrosion Control Treatment	
February 27, 2015	DEQ response (includes misstatement regarding Optimized Corrosion Control Treatment).	
April 6, 2015	Proposal from Flint regarding installation of Granular Activated Carbon to reduce TTHMs.	
April 23, 2015	EPA e-mail regarding corrosion control treatment.	
April 24 and May 1, 2015	DEQ responses regarding corrosion control treatment	
April 27, 2015	EPA provided bottles to 212 Browning for lead/copper analyses.	
May 6, 2015	Lead service line replaced at 212 Browning. EPA on-site. EPA retained piece of lead service line. Indicates a report will be forthcoming.	
May 27, 2015	EPA e-mail indicating homes on each side of 212 Browning were sampled (15 samples per house).	
May 28, 2015	EPA e-mail regarding results at 212 Browning – all samples ok.	
June 9, 2015	2nd Violation Notice for TTHM	
June 10, 2015	Conference call with EPA	
June 30, 2015	Email from EPA regarding high lead result and concerns regarding corrosion control. Scheduled conference call for July 21, 2015.	
June 30, 2015	2nd round of Pb/Cu monitoring concludes.	

FLINT DRINKING WATER EVENTS TIMELINE

Date	Event	Attachment
July 1, 2015	EPA summary of conference call on June 10, 2015.	
July 9, 2015	Reporter informs DEQ that EPA draft interim memo is on ACLU website.	
July 21, 2015	Conference call with EPA. First mention of alternate interpretation by EPA. EPA indicates will follow up with legal review.	
July 24, 2015	DEQ email –determination of 90th percentile calculation = 11ppb and City of Flint needs to add corrosion control treatment.	
July 28, 2015	DEQ received blood Pb level information from DHHS indicating that results since the switch to the Flint River are consistent with past years seasonal variations.	
August 4, 2015	Meeting with city representatives at Governor's office.	
August 17, 2015	DEQ notifies Flint of Pb/Cu monitoring results and requires City to install corrosion control treatment. (2nd 6-month lead and copper sampling completed 69 samples, 90th% = 11 ppb)	
August 23, 2015	DEQ receives first contact from V-T researcher (Marc Edwards) informing DEQ that he is beginning a study of water quality in Flint and publishing results on website.	
August 25, 2015	DEQ email to resident (LeeAnne Walters) at 212 Browning in follow-up to August 4, 2015 meeting.	
August 28, 2015	EPA comment on V-T researcher beginning study in Flint.	
September 2, 2015	Disinfection Byproducts (TTHM) return to compliance	
September 11, 2015	EPA email confirming that DEQ was never sent the draft June 24, 2015 memo even though it appears that DEQ was cc'd on the document.	
September 21, 2015	Meeting with Congressional representatives, legislators, EPA and DEQ to discuss issues with water quality in Flint.	

FLINT DRINKING WATER EVENTS TIMELINE

Date	Event	Attachment
September 22, 2015	Meeting/Conference call with DHHS, GCHD, and DEQ to discuss lead education/outreach.	
Sept 24, 2015	Hurley Children's Hospital data reveals high lead levels in Flint children	
September 25, 2015	Flint issues Lead Advisory	
October x(check on date for this), 2015	State screening results show elevated lead levels in Flint schools	
October 1, 2015	GCHD issues "Do Not Drink" Advisory	
October 2, 2015	DEQ and DHHS press conference. Governor's Flint Action Plan announced.	
October 2, 2015	GCHD school screening samples collected.	
October 8, 2015	Governor Press Conference. Flint to reconnect to Great Lakes Water Authority.	
October 15, 2015	State Legislature authorizes a \$9 million to assist the City of Flint to pay for the return to the Detroit water system and to fund staff at schools to gauge lead exposure	
October 16, 2015	First weekly coordination meeting held with the City of Flint and state agencies	
October 16, 2015	DEQ meets with Flint Schools Superintendent and Genesee County Health Department	
October 16, 2015	Flint switches back to DWSD for water	
October 21, 2015	Governor Snyder announces formation of Flint Water Task Force to complete an After-Action Review	
July 2016	Planned connection to Karegnondi Water Authority (Lake Huron water to Flint WTP)	

FLINT DRINKING WATER EVENTS TIMELINE

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, October 14, 2015 3:42 PM
To: Groetsch, Kory J. (DHHS); Dykema, Linda D. (DHHS)
Cc: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Krisztian, George (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: Flint PbCu data DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA.
Attachments: 2014 Flint PbCu.pdf; 2015 Flint PbCu.pdf; Flint 90th calculation 14-15.xlsx

Attached are the pdf/scanned forms that were submitted by the city (we do have the individual lab sheets, but didn't think those would be helpful) for the 2 six month rounds of monitoring conducted (July – December 2014 and January – June 2015). Also, Adam has provided the excel spreadsheet that he used to calculate the 90th percentile numbers for both rounds.

Ask if you have questions.

Liane

From: Rosenthal, Adam (DEQ)
Sent: Wednesday, October 14, 2015 3:34 PM
To: Shekter Smith, Liane (DEQ)
Subject: Flint PbCu data

The excel document is sorted low to high for each parameter and are independent of each other, ie. same row doesn't mean from the same site.

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

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

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



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.

Failure to submit this information is a violation of Act 398 and may subject the water supply to enforcement penalties.

Administrative Rule R 326.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint
2. County: Genesee 3. WSSN: 2310
4. Population: _____ 5. Monitoring Period: From: 7/1/2014 To: 12/31/2014
6. Minimum # of Samples Required: 100 7. # of Samples Taken: 100
8. Name of Certified Laboratory: MDEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see Instructions paragraph 11, subparagraph "Sample Category."

Comments: The increased number of samples required has led to many new sample sites.

10. NAME:

Name: Michael Glasgow

Title: Assistant Water Plant Supervisor Phone: (810)787-6537 Date: 2/27/15

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
2205 Flushing Rd. ✓	11/19/14	1	L		N.D.	110	
3814 Whitter Ave. ✓	11/20/14	1	L		2	N.D.	
3521 Bennett Ave. ✓	11/21/14	1	L		2	N.D.	
1914 Penbrook Ln. ✓	11/20/14	1	L		N.D.	N.D.	
305 Allendale Pl. ✓	11/24/14	1	L		2	130	
518 Frost St. ✓	12/1/14	1	L		1	N.D.	
3120 Norwood Dr. ✓	12/2/14	1	L		N.D.	N.D.	
1901 Crestbrook Ln. ✓	11/25/14	1	L		N.D.	70	
3727 Maryland Ave. ✓	12/3/14	1	L		1	N.D.	
1220 Beard St. ✓	12/2/14	1	L		10	60	
3718 Dolphaine Ln. ✓	12/3/14	1	L		N.D.	N.D.	
2213 Flushing Rd. ✓	12/3/2014	1	L		1	100	
721 East St. ✓	12/10/14	1	L		9	120	
1125 Barrie Ave. ✓	12/5/14	1	L		4	N.D.	
1505 Woodlawn Park Dr. ✓	12/8/2014	1	L		5	N.D.	
2622 Windmere ✓	12/7/14	1	L		5	N.D.	
3517 Bennett ✓	12/10/14	1	L		3	N.D.	
927 Kensington Ave. ✓	12/5/14	1	L		N.D.	110	
1109 Kensington Ave. ✓	12/4/14	1	L		N.D.	N.D.	
1901 Montclair Ave. ✓	12/5/14	1	L		4	60	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information, see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
1809 Lynbrook	12/4/14	1	L		2	N.D.	
1130 Simcoe Ave.	12/5/14	1	L		2	50	
413 Burroughs Ave	12/4/14	1	L		N.D.	N.D.	
2079 Zimmerman	12/8/14	1	L		4	N.D.	
2616 Westwood Pkwy	12/6/14	1	L		2	280	
2441 Norbert	12/8/14	1	L		8	60	
711 Kensington Ave.	12/9/14	1	L		3	N.D.	
2016 Gold Ave.	12/4/14	1	L		2	N.D.	
618 S. Meade St.	12/8/14	1	L		2	N.D.	
2802 Westwood Pkwy.	12/5/14	1	L		1	110	
860 Schafer St.	12/8/14	1	L		N.D.	70	
1021 S. Franklin Ave.	12/5/14	1	L		4	N.D.	
1616 Durand St.	12/5/14	1	L		N.D.	200	
928 Durand	12/7/14	1	L		N.D.	N.D.	
2730 Westwood Pkwy	12/4/14	1	L		23	290	
1543 Kearsley Park Blvd.	12/4/14	1	L		1	N.D.	
2920 Parkside Dr.	12/5/14	1	L		10	220	
2721 Westwood Pkwy	12/5/14	1	L		2	110	
1002 Durand St.	12/4/14	1	L		2	110	
2560 Thomas St.	12/4/14	1	L		N.D.	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
815 Bradley Ave. ✓	12/7/14	1	L		5	270	
4013 Brownell Blvd. ✓	12/8/14	1	L		2	80	
2418 Gold Ave. ✓	12/10/14	1	L		N.D.	N.D.	
626 Commonwealth Ave. ✓	12/5/14	1	L		3	N.D.	
920 Stocker St. ✓	12/9/14	1	L		N.D.	N.D.	
430 Westcombe Ave. ✓	12/9/14	1	L		2	N.D.	
1623 Neome Dr. ✓	12/5/14	1	L		7	70	
3802 Gorey Ave. ✓	12/8/14	1	L		1	50	
1720 Davison Rd. ✓	12/4/14	1	L		2	130	
2110 Mountain Ave. ✓	12/8/14	1	L		5	60	
2006 Clement St. ✓	12/3/14	1	L		3	N.D.	
2028 Corunna Rd. ✓	12/7/14	1	L		N.D.	N.D.	
2829 Yale St. ✓	12/10/14	1	L		N.D.	N.D.	
1914 W. Home Ave. ✓	12/15/14	1	L		4	N.D.	
2920 N. Dexter St. ✓	12/15/14	1	L		N.D.	70	
2810 Kellar Ave. ✓	12/15/14	1	L		N.D.	N.D.	
3245 Montana Ave. ✓	12/15/14	1	L		4	N.D.	
3623 Norwood Dr. ✓	12/15/14	1	L		1	N.D.	
2801 Reynolds ✓	12/8/14	1	L		2	N.D.	
3510 Brandon St. ✓	12/10/14	1	L		5	80	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

12

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-Ing ²	Lead (ppb)	Copper (ppb)	Lab #
2117 Stanford Ave. <u>L</u>	12/11/14	1	L		3	N.D.	
5806 Leslie Dr. <u>L</u>	12/12/14	1	L		N.D.	N.D.	
1809 W. Home Ave. <u>L</u>	12/11/14	1	L		1	N.D.	
1414 Stone St. <u>L</u>	12/12/14	1	L		2	N.D.	
2006 Aitken Ave. <u>L</u>	12/16/14	1	L		N.D.	N.D.	
3131 Wolcott <u>L</u>	12/17/14	1	L		N.D.	N.D.	
983 Galney Ave. <u>L</u>	12/17/14	1	L		N.D.	100	
2806 Norbert St. <u>L</u>	12/18/14	1	L		N.D.	N.D.	
912 Crawford St. <u>L</u>	12/15/14	1	L		1	110	
4024 Sterling <u>L</u>	12/16/14	1	L		1	N.D.	
3737 Worchester Dr. <u>L</u>	12/16/14	1	L		N.D.	140	
1100 Stockton St. <u>L</u>	12/16/14	1	L		6	N.D.	
1725 Lincoln Ave. <u>L</u>	12/21/14	1	L		2	N.D.	
3139 Colorado <u>L</u>	12/16/14	1	L		N.D.	N.D.	
1401 Galney Ave. <u>L</u>	12/20/14	1	L		4	N.D.	
2730 Coventry Ct. <u>L</u>	12/19/14	1	L		N.D.	N.D.	
709 Frost St. <u>L</u>	12/19/14	1	L		N.D.	N.D.	
2307 Radcliffe <u>L</u>	12/20/14	1	L		37	80	
224 E. Court St. <u>L</u>	12/15/14	1	L		4	N.D.	
3440 Rangeley <u>L</u>	12/13/14	1	L		N.D.	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
3808 Brownell Blvd. ✓	12/16/14	1	L		N.D.	90	
1006 Kensington ✓	12/19/14	1	L		2	N.D.	
2517 Delaware Ave. ✓	12/18/14	1	L		5	200	
1810 W. Hobson Ave. ✓	12/21/14	1	L		N.D.	N.D.	
6805 Leslie Dr. ✓	12/21/14	1	L		2	N.D.	
1721 Chelsea Circle ✓	12/22/14	1	L		N.D.	N.D.	
912 Waldman Ave. ✓	12/23/14	1	L		N.D.	N.D.	
3082 Lanning Dr. ✓	12/24/14	1	L		N.D.	N.D.	
25151 Chicago Blvd. ✓	12/26/14	1	L		6	N.D.	
742 Lincoln Ave. ✓	12/26/14	1	L		3	N.D.	
1805 Ramsay Blvd. ✓	12/27/14	1	L		4	N.D.	
1910 Ramsay Blvd. ✓	12/20/14	1	L		N.D.	N.D.	
3009 Montana Ave. ✓	12/29/14	1	L		1	N.D.	
1223 Campbell St. ✓	12/30/14	1	L		1	N.D.	
3821 Delaware ✓	12/27/14	1	L		N.D.	N.D.	
1651 Woodlawn Pk Blvd. ✓	12/29/14	1	L		N.D.	N.D.	
1911 Corry St. ✓	12/30/14	1	L		4	N.D.	
3507 Dearborn Ave. ✓	12/20/14	1	L		6	N.D.	
3829 Ivanhoe Ave. ✓	12/29/14	1	L		N.D.	N.D.	
1559 Chevrolet Ave. ✓	12/30/14	1	L		9	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb	6.0			2
Cu	110			0

Consumer Notice of Lead & Copper Results in Drinking Water

Water Supply Name: City of Flint

County: Genesee WSSN: 2310

Sample Location 2205 Flushing Rd. Date Sampled: 11/19/2014

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

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water which there is no known or expected risk to health. MCLG's allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	Not Detected
	Copper (ppb)	1300	1300	110

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

To reduce exposure to lead in drinking water:

- Run your water to flush out lead. Run the water until it becomes cold.
- Use cold water for cooking and preparing baby formula. Do not cook with or drink water from the hot tap; lead dissolves more easily in hot water.
- Do not boil water to remove lead. Boiling water will not reduce lead levels.
- Look for an alternative sources or treatment of water. If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- Identify if your plumbing fixtures contain lead. New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

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

For more information, contact us at: City of Flint Water Plant (810)787-6537.

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

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



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

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

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: 2310
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 60 7. # of Samples Taken: 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?
For more information see <i>Instructions</i> paragraph 11, subparagraph "Sample Category."		
Comments: Revised report after conference call with DEQ staff. Two samples were removed from list for not meeting sample criteria, and due to population the number of samples required was reduced to 60.		

10. NAME:

Name: Michael Glasgow
Title: Utilities Administrator Phone: 810-766-7135 Date: 8/20/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquette Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751
2606 Mountain Ave.	4/15/2015	1	L	P	N.D.	N.D.	60546

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-Ing ²	Lead (ppb)	Copper (ppb)	Lab #
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robble Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robble Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robble Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robble Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robble Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robble Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/15/14	1	L	P	18	N.D.	68794

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing; Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2114 Flushing Rd.	6/30/15	1	L	P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water

Water Supply Name: City of Flint
 County: Genesee WSSN: 2310
 Sample Location: 401 E. Newall St. Date Sampled: 3/2/15

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

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

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

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

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

For more information, contact us at: City of Flint Water Plant (810) 787-6537.
 For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification:

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

Michael G. Flange UTILITIES ADMINISTRATOR 3/17/15
 Signature Title Date Sent to Consumer

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

Flint 02310

For monitoring period 7/1/14 - 12/31/14

	Pb	Cu
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	1	0
39	1	0
40	1	0
41	1	0
42	1	0
43	1	0
44	1	0
45	1	0

46	1	0
47	1	0
48	1	0
49	1	0
50	2	0
51	2	0
52	2	0
53	2	0
54	2	0
55	2	0
56	2	0
57	2	0
58	2	0
59	2	0
60	2	0
61	2	0
62	2	0
63	2	0
64	2	0
65	2	0
66	2	0
67	2	0
68	3	0
69	3	50
70	3	50
71	3	60
72	3	60
73	3	60
74	4	60
75	4	70
76	4	70
77	4	70
78	4	70
79	4	80
80	4	80
81	4	80
82	4	90
83	4	100
84	5	100
85	5	110
86	5	110
87	5	110
88	5	110
89	5	110
90	6	110
91	6	120
92	6	130

93	7	130
94	8	140
95	9	200
96	9	200
97	10	220
98	10	270
99	23	280
100	37	290

90th
average
max
min
> AL

6	110
3	38
37	290
0	0
2	0

Pb	Cu	
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	1	0
15	1	0
16	1	0
17	1	0
18	2	0
19	2	0
20	2	0
21	2	0
22	2	0
23	2	0
24	2	0
25	2	0
26	2	0
27	2	0
28	2	0
29	3	0
30	3	0
31	3	0
32	3	0
33	3	0
34	3	50
35	3	50
36	3	50
37	3	50
38	3	60
39	3	60
40	4	60
41	4	60
42	5	60
43	5	60
44	5	70
45	5	70
46	5	80

02310 - Flint PbCu 1st 1/2 2015

47	5	80
48	5	80
49	5	90
50	6	100
51	6	100
52	6	100
53	6	100
54	7	110
55	7	110
56	7	110
57	8	130
58	8	140
59	9	140
60	10	150
61	10	160
62	11	160
63	13	170
64	18	190
65	21	200
66	22	270
67	29	280
68	42	310
69	42	520

90th = 62.1

90th	11.2	161 ppb
average	5.72	66.38
max	42	520
min	0	0
# > AL	6	0

Rennaker, Joanne (DEQ)

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

FYI

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

Hello Jim,

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

- Bob

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

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

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

General

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

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

Sampling protocol

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

Timing of Sample Collection

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

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

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

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

On-Site Assessment

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

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

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

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

Sampling Volumes

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, January 14, 2015 8:15 AM
To: Busch, Stephen (DEQ); Cook, Pat (DEQ)
Subject: FW: Flint THM Operational Evaluation Report Draft
Attachments: Flint-TTHM-OER-DRAFT_toMDEQ.pdf

I reviewed Flint's draft OEL report; and jotted down some preliminary comments (nothing overly critical). I will call Jeff later today to go over what I have. I plan to compile my comments and send an official punch-list to Jeff within the next week. If you have any comments/questions....let me know and I will add them to the list. I will plan to meet with the city and LAN soon afterwards to discuss completion of the OEL report and schedule of implementation of TTHM reduction measures.

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

From: Hansen, Jeff [<mailto:jrhansen@lan-inc.com>]
Sent: Tuesday, January 13, 2015 3:22 PM
To: Prysby, Mike (DEQ)
Subject: FW: Flint THM Operational Evaluation Report Draft

Hi Mike,

I figured it was about time to follow up and see if you had put together any review comments on the draft report for Flint?

Jeffrey R. Hansen
 Senior Project Manager

From: Hansen, Jeff
Sent: Monday, December 01, 2014 4:18 PM
To: Mike Prysby; 'buschs@michigan.gov'; 'cookp@michigan.gov'
Cc: Brent Wright (bwright@cityofflint.com); Daugherty Johnson (djohnson@cityofflint.com); hcroft@cityofflint.com; jwgreen@lan-inc.com; Matta, Samir; mglasgow@cityofflint.com
Subject: Flint THM Operational Evaluation Report Draft

Mike,

In response to your letter dated 9/10/14 and our meeting on 11/07/14 please find attached a draft of the OER for your review and comment.

Jeffrey R. Hansen
 Senior Project Manager



**Lockwood, Andrews
& Newnam, Inc.**

A LEO A DALY COMPANY

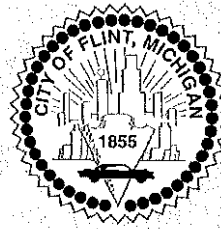
1311 South Linden Road, Suite B • Flint, MI 48532

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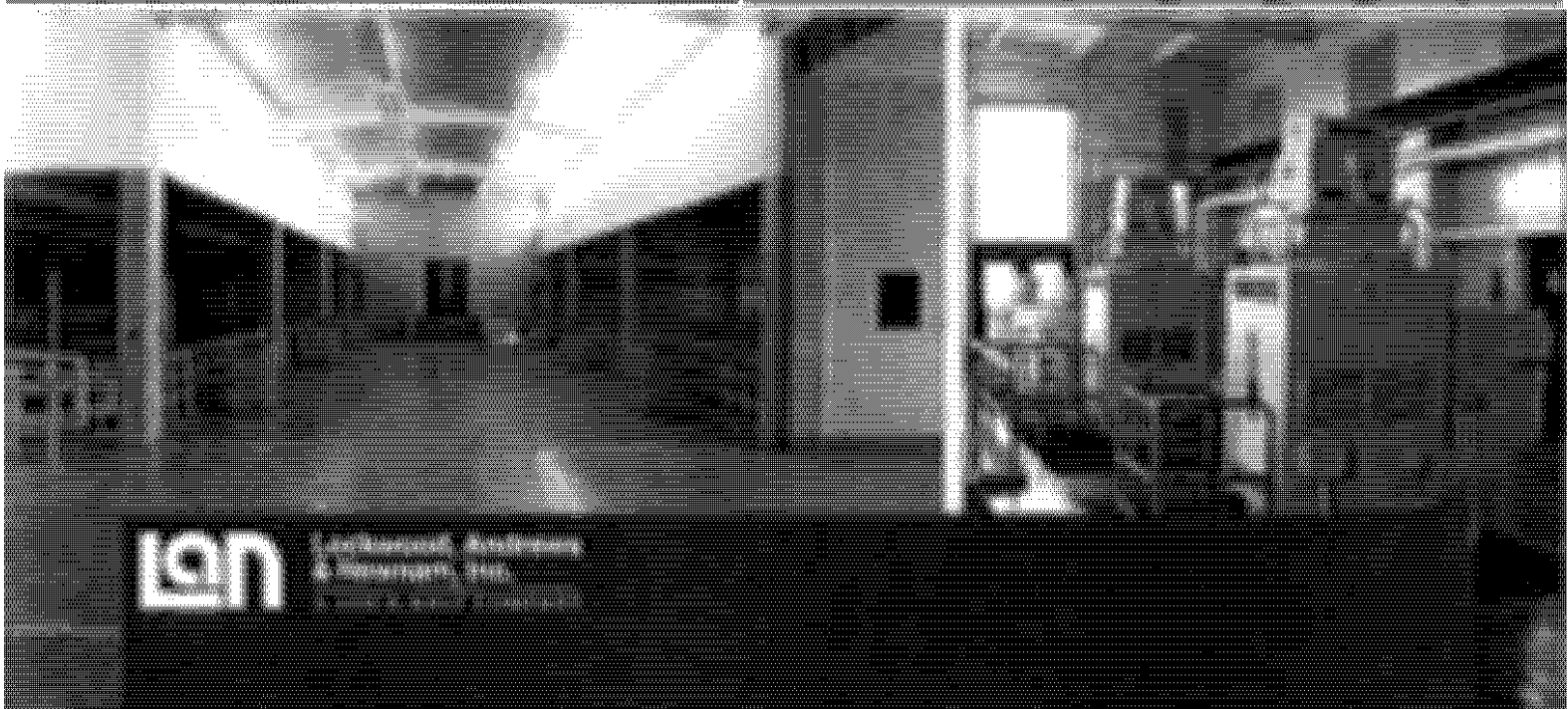
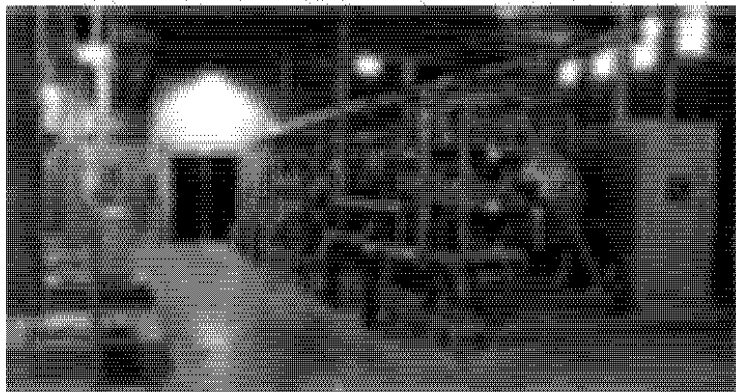
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Operational Evaluation Report City of Flint



Trihalomethane Formation Concern

November 2014



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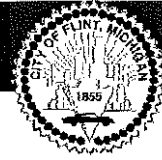


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EXECUTIVE SUMMARY

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



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:

$$(2 \times \text{current quarter value} + \text{previous 2 quarter values}) / 4$$

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		
	1 st Qrt 5/21/14	2 nd Qrt 8/21/14	3 rd Qrt	1 st Qrt 5/21/14	2 nd Qrt 8/21/14	3 rd 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



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 CaCO ₃	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.



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.



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]

DRAFT



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 exceedances 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*



- *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 completed]

- *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*



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



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.

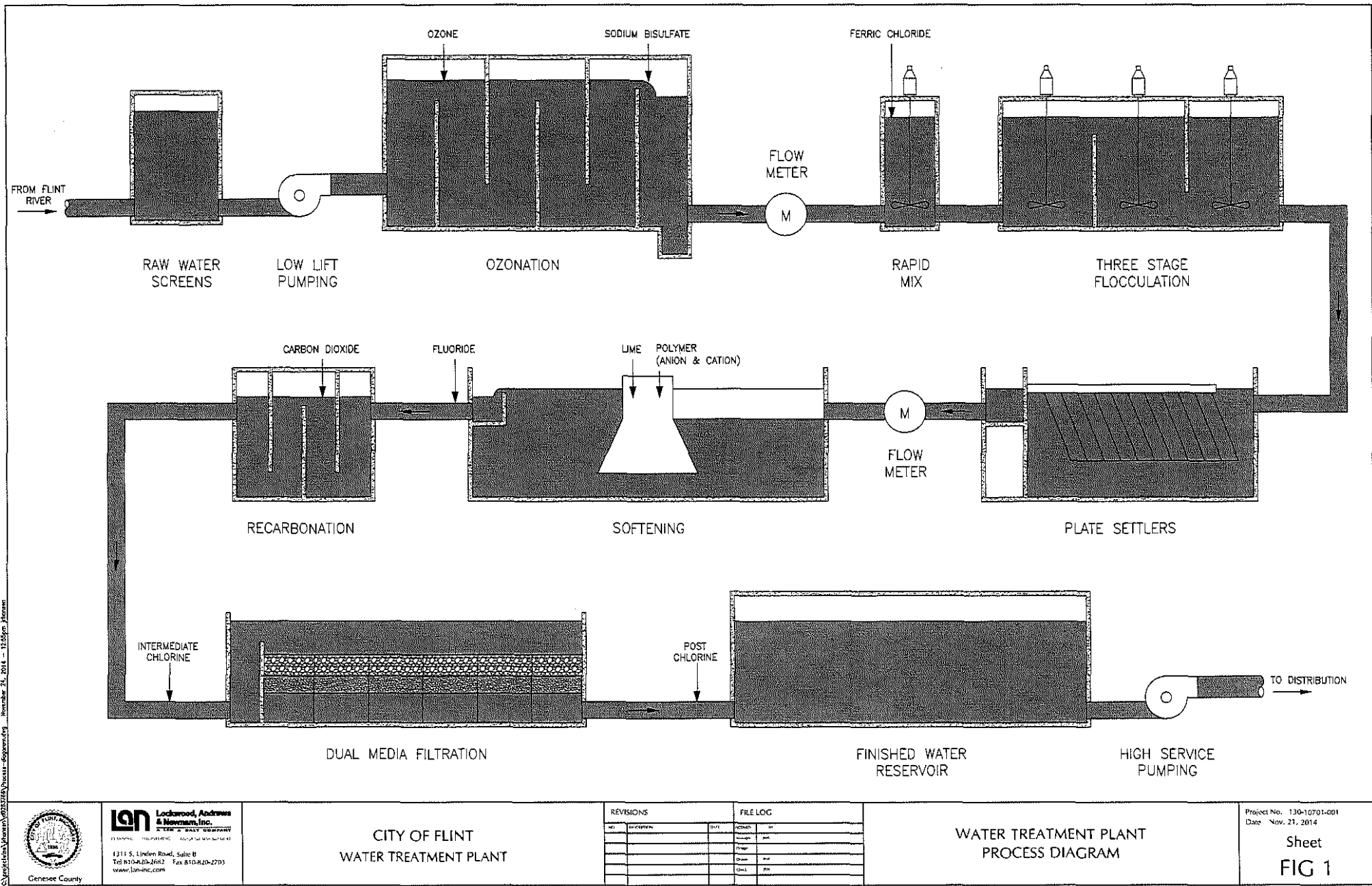
CITY OF FLINT
Operational Evaluation Report
December 1, 2014



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.



Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Monday, March 02, 2015 7:40 AM
To: Busch, Stephen (DEQ)
Cc: Poy, Thomas; Deltoral, Miguel
Subject: FW: Flint TTHM Results
Attachments: FLINT TTHM RESULTS.docx

Thank you, Steve. These results are really good. Thanks for sharing.
Jennifer

From: Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]
Sent: Friday, February 27, 2015 1:00 PM
To: Crooks, Jennifer
Subject: Flint TTHM Results

Jennifer,

Attached is the updated TTHM results with the most recent quarterly samples from February 2015.

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

FLINT TTHM RESULTS

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

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, July 16, 2015 8:50 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Philip, Kris (DEQ)
Subject: FW: Flint Water Question from a Pregnant Flint Resident

FYI—our response to a citizen complaint from Flint.
 Jennifer

From: Mona Munroe-Younis [mailto:mona.m.younis@gmail.com]
Sent: Thursday, July 16, 2015 7:45 AM
To: Bair, Rita
Cc: Crooks, Jennifer; Deltoral, Miguel; Harris, Kimberly; Porter, Andrea
Subject: RE: Flint Water Question from a Pregnant Flint Resident

Hi Rita,

Thank you very much for your detailed response. It is helpful and I appreciate it greatly.

All the best,
 Mona

On Jul 14, 2015 5:22 PM, "Bair, Rita" <bair.rita@epa.gov> wrote:

We are responding to your email of July 11, 2015 to Miguel Del Toral. He is out of the office today, but has provided the following information to your lead questions. Overall, he agrees with Marc's responses on the water filter. Filters that are certified to remove lead are typically designed to remove 99 percent of the lead. They are also designed with additional capacity as a safety measure, but you should still change the filter in accordance with the manufacturer's instructions. If you identify elevated lead levels from other taps that do not have water filters, we suggest either adding a filter to those, such as the bathroom tap, or only using the filtered tap water for consumption.

If you are still interested in having your water tested you should use a laboratory that has been certified by the State for drinking water analyses (a list is available from the following link: http://www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html). Please note that a first-draw sample, regardless of pre-flushing, is best for identifying lead that comes from the faucet and other in-home piping or fittings close to the faucet. First-draw sampling does not give a good indication of the lead contribution from sources further from the faucet (i.e. lead service line, leaded brass meter, etc.). Information for residents about first-draw sampling instructions can be found on the last page of the 2006 memo on aerators and LCR sampling at the following link: http://www.epa.gov/ogwdw/lcrmr/pdfs/memo_tapsamples-aerators_10202006.pdf. In addition, below are two graphics from our Region 5 website with information about how to identify if you have a lead service line coming into your home and for faucets that do not have filters on them, how to clean the aerators.

Regarding your TTHM question, EPA has considered developmental and reproductive risks from multiple intake routes of exposure (e.g., ingestion, inhalation, and dermal) in our 2006 Disinfectants and Disinfection Byproducts (DBPR) rule. Some studies did suggest associations between TTHM exposure and various adverse reproductive and development health effects. However, studies available overall showed inconsistent results. As such, our Agency could not conclude whether exposure to TTHMs could cause adverse reproductive/developmental health effects. However, we did note in our findings that there was the potential for concern.

Currently, we are in the process of re-evaluating our DBPR rules and considering new toxicological data regarding reproductive and developmental health effects. Until our evaluation is complete, pregnant women can elect to take additional precautionary measures such as taking shorter showers, venting the room while showering/bathing, and not ingesting water with high TTHM concentrations.

We hope this information is helpful to you.

Rita D. Bair

Section 2 Chief

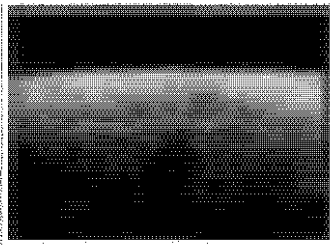
Ground Water and Drinking Water Branch

USEPA-Region 5

phone: (312) 886-2406

fax: 312-692-2132

What do lead service lines look like?



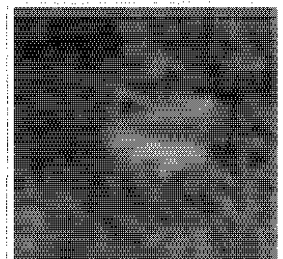
Lead service lines are generally a dull gray color and are very soft. You can identify them easily by carefully scratching with a key. If the pipe is made of lead, the area you've scratched will turn a bright silver color. Do not use a knife or other sharp instrument and take care not to puncture a hole in the pipe.



Lead service lines can be connected to the residential plumbing using solder and have a characteristic solder "bulb" at the end, a compression fitting, or other connector made of galvanized iron or brass/bronze.



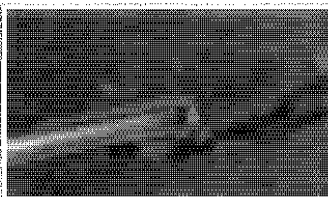
Lead service lines often end just inside the front or side wall of the home, but may extend further into the building as shown, where the lead service line comes out of the basement floor to the water meter and then back into the floor, continuing further into the building.



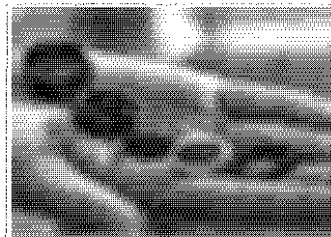
If your home has a water meter, your water meter may be in your home or "meter pit" or "meter vault" as shown above.

Cleaning aerators

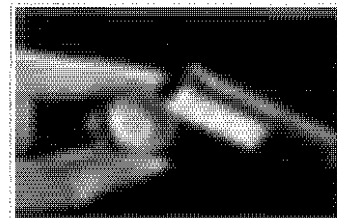
Many taps have an aerator as part of the faucet assembly. Aerator screens are not intended to remove contaminants in water, but may trap sediment or debris as water passes through the faucet. Lead-bearing sediment may end up in drinking water from physical corrosion of leaded solder and can build up in the aerator over time.



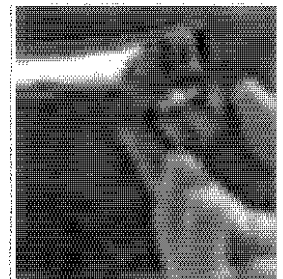
1. Remove the aerator by twisting off with hands or pliers.



2. One or more parts are contained within the aerator. Note the order and orientation of the parts as you remove them.



3. Rinse the pieces with water and brush off the debris. For deposits that are difficult to remove, soak the parts in water for a few minutes and scrub with a toothbrush. Backwashing aerator components is also an effective cleaning method for many aerator types. Hold the removed aerator upside down under flowing water to backwash screens and mesh filters.



4. Reassemble the aerator by screwing it back onto the faucet and hand-tighten. If any parts are cracked or broken, replace them. If the washer has hardened, it should be replaced.

From: Mona Munroe-Younis [mailto:mona.m.younis@gmail.com]
Sent: Saturday, July 11, 2015 5:57 PM
To: deltoral.miguel@epa.gov; edwardsm@vt.edu
Subject: Flint Water Question from a Pregnant Flint Resident

Dear Dr. Edwards and Dr. Del Toral,

Thank you for the work you have already done in my city to protect families from water contaminant exposure. I am a Flint resident, pregnant with my first child, and therefore advised to drink a whopping 10-16 cups of water each day. I am writing to see if you can shed some light or point me to another source for answers regarding water testing and the safest option for staying hydrated.

If your wife or sister or friend were living in Flint and pregnant, what course of action would you recommend she take? Here is my situation:

- A little background: Prior to becoming pregnant, I installed a pur advanced water filter on our kitchen faucet and always use it when drinking from the tap, which I do frequently. (According to the pur website, the filter is said to filter out 70+ chemicals. Recently, I contacted the company to request more information on exactly what chemicals are filtered and up to what level, and am awaiting their reply.) When using the filter, the water is crystal clear, free of the river smell and without the slight yellow tinge that we sometimes have coming out of the tap (unlike in our bathroom sink which I use to brush my teeth...). I was compelled to purchase the filter because my legs began to swell after Flint changed to the river water, and after installing the filter this problem went away. I even tested the difference by drinking filtered water some days (consistently no swelling) and and unfiltered water others (consistent swelling) for a week or two. I understand the swelling to be the result of sodium chloride in our water which is corrosive enough to make GM stop using Flint water in their local plant (http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html)
- Given your findings of high levels of lead in some residents' water, my husband strongly believes that I should cease drinking all Flint water and drink bottled water instead. However, I have read extensively about safety concerns of plastic-bottled water (chemists who work with plastics avoid drinking it) and this does not seem to be a safer option despite frequent bottled water drives organized by well-meaning activists across Flint.
- I would like to test our house's tap water with and without the kitchen filter using an independent lab, but my husband thinks this will be a futile effort because we have no reliable way of knowing if the results on one day will be consistent with results on other days, such as if the City of Flint were doing some special change to the water treatment procedure. Would testing multiple times across several weeks be sufficient to address this possibility? If so, how many times and at what interval would you

recommend testing, and can you recommend a testing lab? If a high level of lead is discovered, who should we contact to determine where the lead is coming from as a next step?

- According to the consultant that Erin Brockovich sent to Flint earlier this year (http://www.mlive.com/news/flint/index.ssf/2015/02/tthm_how_worried_should_flint.html), total trihalomethanes (TTHM) in the water are dangerous to pregnant women through inhalation exposure during hot showers. (And pregnant women tend to appreciate long, hot showers because our backs are constantly aching!) At this point, the lead issues seem more frightening, though we are considering investing in a costly whole-house water filtration system to deal with both. How can we determine the relative risk to pregnant women for lead in the water vs. TTHMs? I suppose that could differ from house to house. What sort of whole-house filtration would you recommend?
- Are there any other considerations that you think I should keep in mind?

Even for those residents who are privileged to be educated and able to afford water filtration devices, the public water issues we are living with are confounding. The information we receive about our public water supply tends to be fragmented and coming from local public officials who have an interest in downplaying public concerns. In the meantime, it is very difficult to make truly informed decisions about our health.

Thank you in advance for any insights you can share and helping to give my baby a good start in life. I understand if you need to respond as a fellow resident of the world and as experts in general rather than as affiliates of the organizations in which you are employed.

Thank you much,

Mona Munroe-Younis

2721 Indian Bow Trail, Flint, MI 48507

(810) 845-4633

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 15, 2015 5:47 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: PRELIMINARY & DELIBERATIVE. NOT SUBJECT TO FOIA: Status of Action Steps

Please see Mike's updates below.

From: Prysby, Mike (DEQ)
Sent: Thursday, October 15, 2015 4:56 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: PRELIMINARY & DELIBERATIVE. NOT SUBJECT TO FOIA: Status of Action Steps

Liane,

Here is today's summary of the status of action steps assigned to me:

Action Step 6: Approve Flint plan for waterline:

The city of Flint and Genesee County received DEQ's approval to place the pipeline into service based on the absence of total coliform bacteria in the pipeline after 2 rounds of sampling.

Action Step 18: Contact KWA to identify any bottlenecks we need to remove:

Additional information was forwarded to me today from Chris Clamphitt concerning two Violation Notices issued by the Lapeer County Road Comm. within the past week against KWA regarding soil erosion, improper restoration, etc. in certain areas of construction. I will forward you the e-mail thread with attached Violation Notice in a separate e-mail. If not resolved, this latest development could cause further delay in KWA pipeline project.

Action Step 19: Expedite 399 plan and phosphate plan:

Nothing received from city or their consultant as of COB today. I will contact both parties tomorrow morning for a status update.

Michael Prysby, P.E.

District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 16, 2015 5:43 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Please see Mike's updates below.

Liane J. Shekter Smith, P.E., Chief
 Office of Drinking Water and Municipal Assistance
 Michigan Department of Environmental Quality
 517-284-6543

From: Prysby, Mike (DEQ)
Sent: Friday, October 16, 2015 4:06 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Liane,

Below is an update of the Action Steps assigned to me.

Action Step 6 – Flint pipeline is ready to be placed into service.

Action Step 18 - Contact KWA to identify any construction bottlenecks

No updates today – this Action Step will be carried over next week to continue working With KWA towards addressing the bottlenecks

Action Step 19 – Expedite 399 Plan and Phosphate Plan

Corrosion control proposal received electronically from LAN this morning (without 399 application). Pat and I are reviewing the proposal and preparing comments. The proposal was forwarded to Darren Lytle and Michael Schock from EPA for their review with comments requested by Monday morning. Darren acknowledged receipt of the proposal. LAN is hand delivering a full sized set of the proposal along with a signed permit application later this afternoon.

Michael Prysby, P.E.

District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Rennaker, Joanne (DEQ)

From: Craig, John (DEQ)
Sent: Thursday, February 06, 2014 2:42 PM
To: Busch, Stephen (DEQ); Arduin, Jim (DEQ); Brim, Richard (DEQ)
Subject: FW: update regarding Bray Road consent order
Attachments: city-of-flint-bray-road-co-2014-02-06-draft.docx

Importance: High

Steve and Jim, I have attached a draft consent order related to the city of Flint Bray Road site pursuant to Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451. This is a rough draft based on the information available to the Office of Waste Management and Radiological Protection, but is a good starting point for development of the consent order. This draft has not been internally distributed for review and comment by DEQ staff, OWMRP and ODWMA management, or the Department of Attorney General, so it is subject to additional changes. However, in the interest in moving the project along, you may share it with the City and their representatives, with the above caveat, in order to continue what I hope will be fruitful discussions next Monday.

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

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

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

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

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

Sent from my iPhone

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

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

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

From: Robinson, Michael [<mailto:MRobinson@wnj.com>]
Sent: Thursday, February 06, 2014 9:26 AM
To: Arduin, Jim (DEQ)

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

Subject: Re: update regarding Bray Road consent order

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

Sent from my iPhone

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

Mike,

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

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

Jim

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

Please note the new phone number.

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

Any chance you can send me a draft on Thursday?

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

Mike,

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

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

Jim

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

Please note the new phone number.

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

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

OWMRP Order No. 115- -14

CONSENT ORDER

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

STATEMENT OF PURPOSE

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

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

Finally, if the Respondent decides to reconstruct the system for the non-mechanical dewatering of its WTP residuals at the Site, then the Respondent will submit plans and specifications and secure from the DEQ, Office of Drinking Water and Municipal Assistance ("ODWMP"), a public water supply construction permit issued under Section 4 of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), MCL 325.1001 *et seq.*, and the administrative rules under Act 399 prior to initiating any construction, alteration, addition, or improvement to such system. A residuals management plan for the historical disposal of lime sludge and other WTP residuals, as well as lime sludge and any other WTP residuals generated in the future, must also be included as part of the construction permit application.

I. DEFINITIONS

- 1.1 "Act 399" means the Safe Drinking Water Act, 1976 PA 399, as amended, MCL 325.1001 *et seq.*
- 1.2 "FAM" means the financial assurance mechanism acceptable to the DEQ to pay for monitoring, operation and maintenance, oversight, and other costs determined by the DEQ to be necessary to ensure the effectiveness and integrity of the remedial action. The FAM is a component of a Remedial Action Plan.

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- 1.3 "NREPA" means the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*
- 1.4 "Open dump" means any area, place, or property where solid waste has been illegally disposed of or abandoned in place of other disposal.
- 1.5 "Part 115" means Part 115, Solid Waste Management, of the NREPA, MCL 324.11501 *et seq.*, and the Part 115 Administrative Rules.
- 1.6 "Part 115 Rules" means the administrative rules promulgated under Part 115.
- 1.7 "Part 201" means Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*, and the Part 201 Administrative Rules.
- 1.8 "Residuals Management Plan" means a DEQ-approved plan to remove both historical and future accumulations of lime sludge and other WTP residuals from the Site.
- 1.9 "Site" means the property located at 5200 Bray Road, Genesee Township, Genesee County, Michigan.
- 1.10 "Solid Waste" as used in this Consent Order means "solid waste" as defined in Part 115 of the NREPA, MCL 324.11506(1), including any waste that has been disposed of at the Site, including lime sludge from WTP operations conducted by the Respondent.

II. STIPULATIONS

The Respondent and the DEQ stipulate as follows:

- 2.1 Pursuant to its authority under Part 115, the DEQ promulgated administrative rules necessary to implement Part 115. These rules are set forth in the 2005 *Annual Administrative Code Supplement* (AACS), R 299.4101 *et seq.* ("Part 115 Rules").

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- 2.2 Pursuant to its authority under Act 399, the DEQ promulgated administrative rules necessary to implement Act 399. These rules set are set forth in the 2009 AACs, R 325.10101 *et seq.*
- 2.3 Pursuant to the NREPA and Executive Order No. 2011-1, the Director of the DEQ ("Director") is the state official and the DEQ is the state agency charged with the administration and enforcement of Part 115 and Act 399. This Consent Order is authorized under MCL 324.11519(2) and MCL 325.1022.
- 2.4 The Respondent is a "person" as defined by MCL 324.301(g) and MCL 325.1002(m).
- 2.5 The Respondent owns and operates the Site located at 5200 Bray Road, Genesee Township, Genesee County. The Respondent is a state of Michigan municipality.
- 2.6 The Site occupies approximately 76 acres of land adjacent to the Cornwell Drain on its northern boundary. The Cornwell Drain is a tributary to the Flint River. The Site consists of a WTP residuals storage area and contains various water level control structures and discharge points to the Cornwell Drain, and an area of where solid waste has been disposed in an open dump ("Open Dump"). Attachment 2 is an aerial schematic of the Site and shows the approximate boundaries of the WTP residuals storage area and the Open Dump.
- 2.7 The Respondent stipulates that the issuance and entry of this Consent Order is proper and acceptable. This Consent Order shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the OWMRP ("Office Chief"), designee of the Director, pursuant to MCL 324.301(b) of the NREPA.
- 2.8 The Respondent agrees to fully and strictly comply with all provisions of Part 115 and Act 399, the Part 115 Rules, the Act 399 Rules, and all other applicable state and federal statutes.

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- 2.9 The Respondent and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Respondent of the allegations contained in the above-referenced LOWs and Compliance Communication or that the law has been violated.
- 2.10 The Respondent, all Respondent's successors and assigns, and the DEQ agree to and shall be bound by the requirements of this Consent Order.

III. COMPLIANCE PROGRAM

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

- 3.1 On and after the effective date of this Consent Order, the Respondent shall ensure that the Site is secure and that, pursuant to R 299.4128(1), illegal dumping does not occur at the Site.
- 3.2 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall locate groundwater monitoring well MW-04. If MW-04 is found to be located within the footprint of the non-mechanical dewatering system identified in the construction plans referenced in Paragraph 3.4, MW-04 will be properly abandoned/removed within a mutually agreed upon schedule.
- 3.3 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall permanently cap the outlet tower identified in Attachment ____ and take all necessary actions to identify and terminate surface water discharges to the Cornwell Drain.
- 3.4 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the ODWMP for review and approval, an administratively complete

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Act 399 construction permit application for the reconstruction of the non-mechanical dewatering system for WTP residuals at the Site, including the physical barrier that will separate the WTP filter backwash, including lime sludge, from the other solid waste located on the Site. The permit application will clearly identify any areas that will not be used as part of the reconstructed non-mechanical dewatering system and identify any slurry inlet points located outside the system footprint so such inlet points can be permanently capped by the Respondent. The permit application will also include a basis of design for the management of solid WTP residuals within the system.

- 3.5 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the OWMRP for review and approval, any portion of the dewatering system residuals management plan submitted to the ODWMA that is required to comply with Part 115.
- 3.6 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a hydrogeologic monitoring plan ("Hydrogeologic Monitoring Plan") for the Open Dump that complies with R 299.4904, R 299.4905, R 299.4906, R 299.4907, and R 299.4908 of the Part 115 Rules. Upon approval by the DEQ, the Respondent shall implement the Hydrogeologic Monitoring Plan in accordance with the schedule contained therein.
- 3.7 Within sixty (60) days after the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a remedial investigation work plan ("Remedial Investigation Work Plan") for the Open Dump. Upon approval by the DEQ, the Respondent shall implement the Remedial Investigation Work Plan in accordance with the schedule contained therein. If the Respondent believes that sufficient data already exists to define the environmental conditions at the Open Dump, then the Respondent can submit, in lieu of the Remedial Investigation Work Plan, the Remedial Investigation Report identified in Paragraph 3.8 of this Consent Order.

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- 3.8 Within thirty (30) days of completing the remedial investigation, the Respondent shall submit to the DEQ for review and approval, the final results and conclusions of the remedial investigation, including all data, charts, maps, aquifer and soil cross-sections, contaminant concentration contours, diagrams, and other interpretive drawings, in the form of a written report ("Remedial Investigation Report").
- 3.9 If the Remedial Investigation Report fails to delineate the horizontal and vertical extent of the Open Dump or any contamination attributable to the Open Dump, the Respondent shall develop and implement a Phase II remedial investigation. If applicable, a complete and technically adequate work plan for a Phase II remedial investigation ("Phase II Remedial Investigation Work Plan") shall be submitted to the DEQ within sixty (60) days of the DEQ's notification that the Phase II Remedial Investigation Work Plan is necessary. Upon approval by the DEQ, the Respondent shall implement the Phase II Remedial Investigation Work Plan in accordance with the schedule contained therein. The Respondent shall submit final results and conclusions of the Phase II remedial investigation in the form of a written report within thirty (30) days of completion of the Phase II remedial investigation.
- 3.10 If the remedial investigation verifies and/or reveals contamination above criteria established pursuant to Part 201, the Respondent shall submit to the DEQ, within ninety (90) days of written DEQ approval of the Remedial Investigation Report(s) required by Paragraphs 3.7 and 3.8, an assessment of corrective measures ("Assessment of Corrective Measures") that is in accordance with R 299.4443. The Assessment of Corrective Measures shall include an analysis of each potential remedy considered. In addition, the Assessment of Corrective Measures shall identify the final remedial action proposed by the Respondent and provide an explanation of how that action will meet applicable cleanup criteria of Part 201 and be in compliance with Part 115.
- 3.11 Within one hundred twenty (120) days of receipt of written approval of the Assessment of Corrective Measures from the DEQ, the Respondent shall submit to the DEQ for review and approval, a complete and technically adequate remedial action plan

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("Remedial Action Plan") for the Open Dump that is in compliance with the requirements of R 299.4444. The Remedial Action Plan shall include a detailed schedule for implementation. The Remedial Action Plan shall be consistent with the results of the remedial investigation and any other monitoring data collected, reports submitted, and/or investigations conducted prior to submittal of the Remedial Action Plan. The Remedial Action Plan, when implemented, shall comply with the applicable cleanup criteria of Part 201 and, upon approval of the plan by the DEQ, the Respondent shall implement the approved Remedial Action Plan in accordance with the schedule contained therein.

3.12 If, in accordance with an approved Assessment of Corrective Measures, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the Remedial Action Plan, submit to the DEQ for review and approval, a capping and cell closure plan and schedule ("Capping and Cell Closure Plan") and a post closure plan ("Post Closure Plan") for the Open Dump that are in compliance with the requirements of R 299.4425, R 299.4447, respectively, and Part 115. Upon DEQ approval of the Capping and Cell Closure Plan and the Post Closure Plan, the Respondent shall implement the plans in accordance with the schedules contained therein. If the Respondent lacks the expertise and/or manpower to conduct the work in accordance with the DEQ-approved Capping and Cell Closure Plan, the Post Closure Plan, and the Part 115 Rules, the Respondent shall contract the work to be performed by a contractor experienced with landfill construction work.

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

IV. DEQ APPROVAL OF SUBMITTALS

4.1 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Consent Order to be submitted to the DEQ by the Respondent, the following process and terms of approval shall apply.

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- 4.2 To be approved by the DEQ, any work plan, proposal, or other document required to be submitted by this Consent Order shall include all of the information required by the applicable statute and/or rule and all of the information required by the applicable paragraph(s) of this Consent Order.
- 4.3 Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Consent Order and shall be enforceable in accordance with the provisions of this Consent Order.
- 4.4 In the event the DEQ disapproves a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific reasons for such disapproval. The Respondent shall submit, within thirty (30) days of receipt of such disapproval, a revised work plan, proposal, or other document that adequately addresses the reasons for the DEQ's disapproval.
- 4.5 In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it shall notify the Respondent, in writing, of the specific modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require the Respondent to submit, prior to implementation and within thirty (30) days of receipt of such approval with specific modifications, a revised work plan, proposal, or other document that adequately addresses such modifications.
- 4.6 A finding of approval or approval with modification of a submission shall not be construed to mean that the DEQ concurs with any of the conclusions, methods, or statements in the submission or warrants that the submission comports with law.
- 4.7 Failure by the Respondent to submit an approvable work plan, proposal, or other document within the applicable time period specified above shall subject the Respondent to the enforcement provisions of this Consent Order including, but not

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limited to, the stipulated penalty provisions commencing on the date the revised work plan, proposal, or other document was due and accumulating until an approvable work plan, proposal, or other document is submitted.

- 4.8 Any delays caused by the Respondent's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the Respondent's responsibility to comply with any other deadline(s) specified in this Consent Order.
- 4.9 No informal advice, guidance, suggestions, or comments by staff of the DEQ regarding reports, work plans, proposals, plans, specifications, schedules, or any other writing submitted by the Respondent will be construed as relieving the Respondent of its obligation to obtain written approval of the DEQ if and when required by this Consent Order.

V. MODIFICATIONS AND EXTENSIONS

- 5.1 At the request of the Respondent, a work plan, proposal, or other document approved or approved with specific modifications by the DEQ, with the exclusion of the specified deadlines set forth in Section II, Compliance Program, of this Consent Order, may be modified by the OWMRP District Supervisor ("District Supervisor").
- 5.2 The Respondent and the DEQ agree that the Office Chief may, but in no circumstances is obligated to, grant the Respondent an extension of the specified deadlines set forth in this Consent Order. Any extension shall be preceded by a timely written request, received by the DEQ no later than ten (10) business days prior to the pertinent deadline, which shall include:
 - a. An identification of the specific deadline(s) of this Consent Order that will not be met.

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- b. A detailed description of what will prevent the Respondent from meeting the deadline(s).
 - c. A description of the measures the Respondent has taken and/or intends to take to meet the required deadline(s).
 - d. The length of the extension requested and the specific date(s) on which the obligation(s) will be met.
- 5.3 The Office Chief shall respond promptly to such requests and shall not unreasonably withhold approval for such requests.
- 5.4 Any extension of the specified deadlines or other modifications and amendments of this Consent Order shall require a formal written amendment of this Consent Order, shall be signed by the Respondent and the DEQ ("Parties"), shall have as their effective date the date on which they are signed by the Office Chief, and shall be incorporated into and become an enforceable part of this Consent Order.

VI. REPORTING

- 6.1 The Respondent shall submit all items required in Section II, Compliance Program, to the Lansing District Supervisor, OWMRP, DEQ, P.O Box 30241 Lansing, Michigan 48909-7742, unless specifically directed otherwise within this Consent Order. The cover letter with each submittal shall identify the specific paragraph and requirement of this Consent Order that the submittal is intended to satisfy. If the address of the District Supervisor changes, the Respondent will be notified and shall make all subsequent submittals to any new address of which they are notified.
- 6.2 The Respondent shall verbally report any violation(s) of the terms and conditions of this Consent Order to the District Supervisor by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with a

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written report within five (5) business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), the precise cause or causes of the violation(s), a detailed description of any action(s) taken or proposed to correct the violation(s), and a schedule for the implementation of any proposed corrective action(s). The Respondent shall report any anticipated violation(s) of this Consent Order to the District Supervisor in advance of the relevant deadlines, whenever possible.

VII. RETENTION OF RECORDS

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

VIII. RIGHT OF ENTRY

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

IX. FINES, COSTS, AND PENALTIES

- 9.1 Within thirty (30) days of the effective date of this Consent Order, the Respondent shall pay the sum of \${_____} to the State of Michigan in settlement of the DEQ's

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claim for civil fines arising from the violations alleged in the above-referenced LOWs and Compliance Communication.

- 9.2 For each failure to comply with the provisions of Section II, Compliance Program, of this Consent Order, the Respondent shall pay to the State of Michigan stipulated penalties in an amount of \$250 per violation per day for one (1) through seven (7) days of violation; \$500 per violation per day for eight (8) through fourteen (14) days of violation; and \$750 per violation per day for each day of violation thereafter. Stipulated penalties shall be paid within thirty (30) days after receiving a written demand made by the DEQ.
- 9.3 To ensure timely payment of any civil fines, penalties, and costs due under this Consent Order, the Respondent shall pay an interest penalty to the State of Michigan each time the Respondent fails to make a complete or timely payment. This interest penalty shall be based on the rate set forth at Section 6013(6) of the Revised Judicature Act, 1961 PA 236, as amended, MCL 600.6013(6), using the full increment of amount due as principal, and calculated from the due date for the payment until the delinquent payment is finally made in full.
- 9.4 The Respondent shall make all payments due under this Consent Order by certified or cashier's check made payable to the "State of Michigan" and mailed to the DEQ, Revenue Control Unit, P.O. Box 30657, Lansing, Michigan 48909-8157, or hand delivered to the DEQ, Revenue Control Unit, 1st Floor, Van Wagoner Building, 425 West Ottawa Street, Lansing, Michigan 48933. To ensure proper credit, all payments made pursuant to this Consent Order must include Payment Identification Number OWMRP_____ on the front of the check and/or in the cover letter with the payment.
- 9.5 The Respondent agrees not to contest the legality of the civil fine or the costs of surveillance and enforcement paid pursuant to this section. The Respondent further agrees not to contest the legality of any stipulated penalties or interest penalties

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assessed pursuant to this section but reserves the right to dispute the factual basis upon which a demand by the DEQ for stipulated penalties or interest penalties is made.

- 9.6 Liability for or payment of stipulated penalties pursuant to this Consent Order shall not preclude the State of Michigan from seeking injunctive relief or other relief for the Respondent's failure to comply with the requirements of this Consent Order and/or any permit(s) or license(s) required to comply with this Consent Order.

X. DISPUTE RESOLUTION 10.1 Unless otherwise provided in this Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order. However, the procedures set forth in this section shall not apply to actions by the state of Michigan to enforce obligations of the Respondent that have not been disputed in accordance with this section. Engagement of a dispute resolution between the Parties shall not be cause for the Respondent to delay the performance of any compliance requirements or response activity. Any dispute that arises under this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The period of negotiations shall not exceed twenty (20) days from the date of written notice by any Party that a dispute has arisen, unless the time period for negotiations is modified by written agreement between the Parties. The dispute shall be considered to have arisen when one Party sends the other Party a written notice of dispute. If agreement cannot be reached on any issue within this twenty-(20-) day period, the DEQ shall provide a written statement of its decision to the Respondent and, in the absence of initiation of formal dispute resolution by the Respondent under Paragraph 10.3, the DEQ position, as outlined in its written statement of decision, shall be binding on the Parties.

- 10.2 If the Respondent and DEQ cannot informally resolve a dispute under Paragraph 9.1, the Respondent may initiate formal dispute resolution by requesting a review of the disputed issues by the Office Chief. This written request must be filed with the Office Chief within fifteen (15) days of the Respondent's receipt of the DEQ's statement of decision that is

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issued at the conclusion of the informal dispute resolution procedure set forth in Paragraph 9.1. The Respondent's request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation upon which the Respondent bases its position. Within fourteen (14) days of the Office Chief's receipt of the Respondent's request for a review of disputed issues, the Office Chief will provide a written statement of decision to the Respondent, which will include a statement of his/her understanding of the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting her/his position; and all supporting documentation relied upon by the Office Chief's review of the disputed issues. The Office Chief's review of the disputed issues may be extended by written agreement of the Parties.

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

10.4 An administrative record of the dispute shall be maintained by the DEQ. The administrative record shall include all of the information provided by the Respondent pursuant to Paragraph 9.3, as well as any other documents relied upon by the DEQ in making its final decision pursuant to Paragraph 10.3. Where appropriate, the DEQ shall allow submission of supplemental statements of position by the Parties to the dispute.

10.5 In proceeding on any dispute, the Respondent shall have the burden of demonstrating on the administrative record that the position of the DEQ is arbitrary and capricious or otherwise not in accordance with law. In proceedings on any dispute initiated by the

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Respondent, the Respondent shall bear the burden of persuasion on factual issues.

- 10.6 Notwithstanding the invocation of dispute resolution proceedings, stipulated penalties shall accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Order, but payment shall be stayed pending resolution of the dispute. Stipulated penalties shall be paid within thirty (30) days after the resolution of the dispute. The Respondent shall pay that portion of a demand for payment of stipulated penalties that is not subject to dispute resolution procedures in accordance with and in the manner provided in Section IX, Fines, Costs, and Penalties.

XI. FORCE MAJEURE

- 11.1 The Respondent shall perform the requirements of this Consent Order within the time limits established herein unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the Respondent's obligations under this Consent Order in accordance with this section.
- 11.2 For the purpose of this Consent Order, "Force Majeure" means an occurrence or nonoccurrence arising from causes not foreseeable, beyond the control of, and without the fault of the Respondent, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the Respondent's diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the Respondent's actions or omissions.
- 11.3 The Respondent shall notify the DEQ, by telephone, within forty-eight (48) hours of discovering any event that causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or

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causes of delay, the measures taken by the Respondent to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay.

- 11.4 Failure of the Respondent to comply with the notice requirements of Paragraph 10.3, above, shall render this section void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of Paragraph 10.3.
- 11.5 If the Parties to this Consent Order agree that the delay or anticipated delay was beyond the control of the Respondent, this may be so stipulated and the parties to this Consent Order may agree upon an appropriate modification of this Consent Order. If the Parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X, Dispute Resolution, of this Consent Order. The burden of proving that any delay was beyond the reasonable control of the Respondent, and that all the requirements of this section have been met by the Respondent, is on the Respondent.
- 11.6 An extension of any given compliance date based upon a particular incident does not necessarily mean that the Respondent qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

XII. GENERAL PROVISIONS

- 12.1 With respect to any violations not specifically addressed and resolved by this Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the Respondent to comply with the requirements of any state or federal law, including the NREPA and its rules.
- 12.2 Execution of the schedule contained in this Consent Order shall not be construed to

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waive, estop, or otherwise diminish the DEQ's right to seek or impose civil liability upon, and seek appropriate relief from, the Respondent for degradation of waters of the State and the designated uses thereof arising out of the failure of the Respondent to achieve a proper cleanup pursuant to this Consent Order.

- 12.3 This Consent Order does not constitute a warranty or representation of any kind by the DEQ that the response activities performed in accordance with this Consent Order or DEQ-approved work plans will result in the achievement of the remedial criteria established by law, or that the response activities will ensure protection of public health, safety, or the environment.
- 12.4 This Consent Order in no way affects the Respondent's responsibility to comply with any other applicable state, federal, or local laws or regulations including, without limitation, any corrective action or similar requirements applicable to the Site pursuant to the NREPA and its rules.
- 12.5 Nothing in this Consent Order is or shall be considered to affect any liability the Respondent may have for natural resources damages caused by the Respondent's ownership and/or operation of the Site. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.
- 12.6 The Parties agree that the terms and conditions of this Consent Order will be enforceable in circuit court. The Parties further agree that the appropriate venue for the enforcement of this Consent Order shall be the Circuit Court for Genesee County or Ingham County, State of Michigan, which courts shall also be appropriate for dispute resolution.
- 12.7 If any provision or authority of this Consent Order or the application of this Consent Order to any Party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other Parties or circumstances and the remainder of the Consent Order shall remain in force and shall not be affected thereby.
- 12.8 The provisions of this Consent Order shall be binding on the Respondent, the DEQ, and

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their successors and assigns. The Respondent shall give notice of this Consent Order to any prospective successor in interest prior to transfer of ownership of the Site property or any portion thereof and shall notify the DEQ of such proposed sale or transfer.

XIII. TERMINATION

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

- a. The date of compliance with each provision of the compliance program in Section II of this Consent Order and the date any fines, penalties, or costs were paid;
- b. a statement that all required information has been reported to the District Supervisor;
- c. confirmation that all records required to be maintained pursuant to this Consent Order are being maintained by the City; and
- d. additional relevant information requested by the Office Chief.

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

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XIII. SIGNATORIES

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

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

By: _____

Dan Wyant
Director

Name: _____

Title: _____

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

Date: _____

Date: _____

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

Date: _____

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 15, 2015 4:23 PM
To: Wurfel, Brad (DEQ)
Cc: Sygo, Jim (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: More draft answers.... DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA.

Before the switch –

1.b. The city of Flint hired consultants to evaluate the ability to treat water from the Flint River. Their consultants produced a report entitled "Analysis of the Flint River as a Permanent Water Supply for the City of Flint" dated July 2011. DEQ received a copy of this report in March 2013. DEQ staff did meet with city officials and their consultants during 2013 to discuss needed water treatment plant upgrades based on the report.

2. The city operated the water treatment plant as a backup/emergency plant for many years. During this time, the plant was operated in test mode quarterly to ensure that it would function in an emergency and to demonstrate that it could produce safe drinking water. During these test runs, raw water and treated water were sampled for many parameters. An evaluation for corrosion control, however, was not completed.

After the switch –

6. On August 23, 2015 Dr. Edwards informed DEQ staff that he was initiating a study of Flint water quality issues to complement the sampling that was conducted by the city under the Lead and Copper Rule. Dr. Edwards' study was performed after the notification by DEQ on August 17, 2015 to the City of Flint that the city is required to install corrosion control in accordance with the lead and copper rule requirements. The DEQ determination made following the regulatory protocol under the lead and copper rule and the study performed by Dr. Edwards reached similar conclusions.

Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
517-284-6543

Rennaker, Joanne (DEQ)

From: Brim, Richard (DEQ)
Sent: Thursday, February 20, 2014 10:25 AM
To: Busch, Stephen (DEQ); Craig, John (DEQ); Arduin, Jim (DEQ)
Subject: Newest Draft of the Bray Road Consent Order
Attachments: city-of-flint-bray-road-co-2-19-2014 (2).docx

All, attached is the latest version of the Consent Order for your review. When comments are received from you I will send the Order to Cheryl Bartley and Nicole for them to comment. After they comment I will send a draft to Mike Robinson, Rich.

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

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

OWMRP Order No. 115- -14

_____/

CONSENT ORDER

This proceeding results from unresolved allegations specified in the Letters of Warning, (LOWs) issued on April 9, 2001, and February 14, 2002, by the Department of Environmental Quality ("DEQ"), and in Compliance Communications, dated April 15, 1997, April 19, 2002, September 8, 2003, October 28, 2003 and January 18, 2011. (Attachment 1). The DEQ, Office of Waste Management and Radiological Protection ("OWMRP") alleges that the city of Flint ("Respondent") at 5200 Bray Road, Genesee Township, Genesee County, Michigan (the "Site"), placed or allowed the placement of solid waste in an open dump and/or abandoned solid waste in place of other disposal in violation of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Michigan Compiled Laws ("MCL") 324.101 *et seq.* ("NREPA"), and the administrative rules promulgated under Part 115. The Respondent and the DEQ agree to resolve the alleged violations set forth in the above-referenced LOWs and Compliance Communications by entry of this Consent Order.

STATEMENT OF PURPOSE

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

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To accomplish these objectives, the Respondent will determine the areal extent and character of any solid waste historically disposed of at the Site, including, but not limited to, the WTP residuals and any solid wastes identified as being disposed of in the above-referenced LOWs and Compliance Communications. Consistent with the waste characterization and other investigation data, the Respondent will either remove and dispose of the waste at a disposal area that is permitted and licensed by the DEQ, leave the solid waste in place and place final cover over it in accordance with the requirements of Part 115 and this Order. In addition, the Respondent will determine, by conducting a remedial investigation, whether any response activities must be taken to address contamination caused by the unauthorized disposal of solid waste at the Site. The Respondent shall also manage the historical lime sludge at the site as solid waste and dispose of it in accordance with Part 115 requirements, unless it is determined by proper characterization that the historical lime sludge can be used on farm land at appropriate agronomic rates. The Respondent shall include a plan for removal of the historical lime sludge as a condition of this Order. The Respondent plans to use the Flint River as its temporary source of untreated water supply until KWA water is available. The Respondent must undertake the KWA public improvement project or undertake other public improvement projects to continue to use the Flint River, such as additional water treatment plant public improvements, source water protection public improvements and public improvements to obtain back-up water supply, in order to comply with Act 399.

Finally, if the Respondent proposes to reconstruct the system for the non-mechanical dewatering of its WTP residuals at the Site, then the Respondent will submit plans and specifications and secure from the DEQ, Office of Drinking Water and Municipal Assistance ("ODWMA"), a public water supply construction permit issued under Section 4 of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), MCL 325.1001 *et seq.*, and the administrative rules under Act 399 prior to initiating any construction, alteration, addition, or improvement to such system. In lieu of disposal as solid waste residuals management plan for the historical disposal of lime sludge and other WTP residuals, as well as lime sludge and any other WTP residuals generated in the future, must also be included as part of the construction permit application. The Respondent's plans to participate in the Karegnondi Water Authority (KWA) to receive source water from Lake Huron for its drinking water supply and the use of its

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water treatment plant to meet treatment requirements under Act 399. It will be approximately four years before the KWA infrastructure is built and water is available to the Respondent from KWA. The Respondent plans to use the Flint River as its source water supply until KWA water is fully available. Public improvement projects under Act 399 are required to be completed for Respondent to receive water from the KWA.

I. DEFINITIONS

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

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- 1.8 "Residuals Management Plan" means a DEQ-approved plan to remove both historical and future accumulations of lime sludge and other WTP residuals from the Site.
- 1.9 "Site" means the property located at 5200 Bray Road, Genesee Township, Genesee County, Michigan.
- 1.10 "Solid Waste" as used in this Consent Order means "solid waste" as defined in Part 115 of the NREPA, MCL 324.11506(1), including any waste that has been disposed of at the Site, including lime sludge from WTP operations conducted by the Respondent.

II. STIPULATIONS

The Respondent and the DEQ stipulate as follows:

- 2.1 Pursuant to its authority under Part 115, the DEQ promulgated administrative rules necessary to implement Part 115. These rules are set forth in the 2005 *Annual Administrative Code Supplement* (AACS), R 299.4101 *et seq.* ("Part 115 Rules").
- 2.2 Pursuant to its authority under Act 399, the DEQ promulgated administrative rules necessary to implement Act 399. These rules set are set forth in the 2009 AACS, R 325.10101 *et seq.*
- 2.3 Pursuant to the NREPA and Executive Order No. 2011-1, the Director of the DEQ ("Director") is the state official and the DEQ is the state agency charged with the administration and enforcement of Part 115 and Act 399. This Consent Order is authorized under MCL 324.11519(2) and MCL 325.1022.
- 2.4 The Respondent is a "person" as defined by MCL 324.301(g) and MCL 325.1002(m).

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- 2.5 The Respondent owns and operates the Site located at 5200 Bray Road, Genesee Township, Genesee County. The Respondent is a state of Michigan municipality.
- 2.6 The Site occupies approximately 76 acres of land adjacent to the Cornwell Drain on its northern boundary. The Cornwell Drain is a tributary to the Flint River. The Site consists of a WTP residuals storage area and contains various water level control structures and discharge points to the Cornwell Drain, and an area of where solid waste has been disposed in an open dump ("Open Dump"). Attachment 2 is an aerial schematic of the Site and shows the approximate boundaries of the WTP residuals storage area and the Open Dump.
- 2.7 The Respondent stipulates that the issuance and entry of this Consent Order is proper and acceptable. This Consent Order shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the Office of Waste Management and Radiological Protection "(Office Chief)", designee of the Director, pursuant to MCL 324.301(b) of the NREPA.
- 2.8 The Respondent agrees to fully and strictly comply with all provisions of Part 115 and Act 399, the Part 115 Rules, the Act 399 Rules, and all other applicable state and federal statutes.
- 2.9 The Respondent and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Respondent of the allegations contained in the above-referenced LOWs and Compliance Communication or that the law has been violated.
- 2.10 The Respondent, all Respondent's successors and assigns, and the DEQ agree to and shall be bound by the requirements of this Consent Order.

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III. COMPLIANCE PROGRAM

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

- 3.1 On and after the effective date of this Consent Order, the Respondent shall ensure that the Site is secure and that, pursuant to R 299.4128(1), illegal dumping does not occur at the Site.
- 3.2 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall plug or cap the outlet tower identified in Attachment ____ and take all necessary actions to terminate any surface water discharge to the Cornwell Drain. Respondent will not place the outlet tower back into service unless proper permits are acquired.
- 3.3 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the ODWMP for review and approval, an administratively complete Act 399 construction permit application for the reconstruction of the non-mechanical dewatering system for WTP residuals at the Site, including the physical barrier that will separate the WTP filter backwash, including lime sludge, from the other solid waste located on the Site. The permit application will clearly identify any areas that will not be used as part of the reconstructed non-mechanical dewatering system and identify any slurry inlet points located outside the system footprint so such inlet points can be permanently capped by the Respondent. The permit application will also include a basis of design for the management of WTP residuals within the system.
- 3.4 Within thirty (30) days after the effective date of this Consent Order, the Respondent shall submit to the OWMRP for review and approval, any portion of the dewatering system residuals management plan submitted to the ODWMA that is required to comply with Part 115.

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3.5 Within two hundred and forty (240) days of the effective date of this Consent Order, the Respondent shall submit to the DEQ for review and approval, a report that summarizes the site conditions ("Site Conditions Summary Report") "(SCSR)" at the Bray Road Open Dump site. This SCSR shall include, at a minimum, the following:

- Identification of the horizontal and vertical extent of solid waste at the site.
- Estimates, in cubic yards, of the volumes of un-impacted concrete, lime, and other solid waste at the site.

Characterization of the solid wastes at the site including data to support the characterizations.

- Identification, characterization, and delineation of any environmental impacts at the site.
- Identification of general geologic and hydrogeologic site conditions.
- Copies of DEQ approved inertness designations and/or DEQ approved "other beneficial reuse" authorizations obtained by Respondent

The SCSR should include information that is typically found in a remedial investigation report.

If the SCSR identifies that no environmental impacts exist at the site and the only issue to address is the solid waste identified at the site, Respondent may submit a "Solid Waste Removal Plan" as identified in paragraph 3.12. Otherwise, Respondent shall proceed with paragraphs 3.6 through 3.11.

3.6 If the SCSR fails to delineate the horizontal and vertical extent of solid waste, or fails to delineate any contamination identified at the site, or fails to support conclusions identified in the report, or is dis-approved for other specified deficiencies, the Respondent shall develop and implement a remedial investigation. A complete and technically adequate work plan for a remedial investigation Remedial Investigation Work Plan "(RIWP)" shall be submitted by Respondent to the DEQ within sixty (60) days of the DEQ's notification to Respondent that the RIWP is necessary. Upon approval by the DEQ, the Respondent shall implement the RIWP in accordance with the schedule contained therein. The Respondent shall submit, for review and approval by DEQ, final results and conclusions of the remedial investigation in the form of a written report

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Remedial Investigation Report "(RIR)" within thirty (30) days of completion of the remedial investigation.

- 3.7 Within ninety (90) days of written DEQ approval of the RIR required by Paragraph 3.6, or written DEQ approval of the SCSR required by Paragraph 3.5, the Respondent shall submit to the DEQ, an Assessment of Corrective Measures "(ACM)" that is in accordance with R 299.4443. The ACM shall include an analysis of each potential remedy considered. In addition, the ACM shall identify the final remedial action proposed by the Respondent and provide an explanation of how that action will meet applicable cleanup criteria of Part 201 and be in compliance with Part 115.
- 3.8 Within one hundred twenty (120) days of receipt of written approval of the ACM from the DEQ, the Respondent shall submit to the DEQ for review and approval, a complete and technically adequate remedial action plan Remedial Action Plan "(RAP)" for the Open Dump that is in compliance with the requirements of R 299.4444. The RAP shall include a detailed schedule for implementation. The RAP shall be consistent with the results of the remedial investigation and any other monitoring data collected, reports submitted, and/or investigations conducted prior to submittal of the RAP. The RAP, when implemented, shall comply with the applicable cleanup criteria of Part 201 and, upon approval of the plan by the DEQ, the Respondent shall implement the approved RAP in accordance with the schedule contained therein.
- 3.9 If, in accordance with an approved ACM, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the RAP, submit to the DEQ for review and approval, a capping and cell closure plan and schedule Capping and Cell Closure Plan "(CCCP)" and a post closure plan Post Closure Plan "(PCP)" for the Site that are in compliance with the requirements of R 299.4425, R 299.4447, respectively, and Part 115. Upon DEQ approval of the CCCP and the PCP, the Respondent shall implement the plans in accordance with the schedules contained therein. If the Respondent lacks the expertise and/or manpower to conduct the work in accordance with the DEQ-approved CCCP, the PCP, and the Part 115 Rules, the

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Respondent shall contract the work to be performed by a contractor experienced with landfill construction work.

- 3.10 If, in accordance with an approved ACM, the Respondent elects to cap and close in-place the solid waste identified at the Site, the Respondent must, as part of the RAP, submit to the DEQ for review and approval, a hydrogeologic monitoring plan ("Hydrogeologic Monitoring Plan") for the Site that complies with R 299.4904, R 299.4905, R 299.4906, R 299.4907, and R 299.4908 of the Part 115 Rules. Upon approval by the DEQ, the Respondent shall implement the Hydrogeologic Monitoring Plan in accordance with the schedule contained therein.
- 3.11 If the Respondent gains approval from the OWMRP to leave solid waste at the site in accordance with Part 115, then Respondent shall be required to provide appropriate financial assurance as required by Part 115.
- 3.12 Within thirty (30) days of receipt of written approval of the SCSR from the DEQ, the Respondent shall submit to the DEQ for review and approval, a Solid Waste Removal Plan "(SWRP)" for the Site. This plan will provide details regarding the proposed removal, and legal disposal, of solid waste identified at the site. In addition, the plan shall include a proposed schedule for waste removal, and a proposed waste removal confirmation sampling plan.
- 3.13 Within sixty (60) days of completion of the SWRP, Respondent shall submit to the DEQ for review and approval, a Solid Waste Removal Report for the Site. This report will contain summaries of waste volumes, final disposition of wastes, copies of landfill receipts, copies of paperwork required by "other beneficial reuse" authorizations and waste removal confirmation sampling results.

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IV. DEQ APPROVAL OF SUBMITTALS

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

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

V. MODIFICATIONS AND EXTENSIONS

- 5.1 At the request of the Respondent, a work plan, proposal, or other document approved or approved with specific modifications by the DEQ, with the exclusion of the specified deadlines set forth in Section II, Compliance Program, of this Consent Order, may be modified by the OWMRP Lansing District Supervisor. Any modifications or extensions in regard to the Act 399 construction permit must be approved by the ODWMA Lansing District Supervisor

city-of-flint-bray-road-co-2-19-2014 (2)

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

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

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

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

VI. REPORTING

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

city-of-flint-bray-road-co-2-19-2014 (2)

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

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

VII. RETENTION OF RECORDS

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

city-of-flint-bray-road-co-2-19-2014 (2)

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VIII. RIGHT OF ENTRY

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

IX. FINES, COSTS, AND PENALTIES

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

city-of-flint-bray-road-co-2-19-2014 (2)

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

X. DISPUTE RESOLUTION

- 10.1 Unless otherwise provided in this Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order. However, the procedures set forth in this section shall not apply to actions by the state of Michigan to enforce obligations of the Respondent that have not been disputed in accordance with this section. Engagement of a dispute resolution between the Parties shall not be cause for the Respondent to delay the performance of any compliance requirements or response activity. Any dispute that arises under this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The

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

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

10.3 The written statement of the Office Chief issued under Paragraph 10.3 shall be binding on the Parties unless, within fifteen (15) days after receipt of the DEQ's written statement of decision, the Respondent files a petition for judicial review in a court of competent jurisdiction that shall set forth a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Order.

city-of-flint-bray-road-co-2-19-2014 (2)

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Nothing in this Consent Order affects the limitations on the timing of judicial review of the DEQ decision regarding the selection, extent, or adequacy of any response activity.

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

XI. FORCE MAJEURE

- 11.1 The Respondent shall perform the requirements of this Consent Order within the time limits established herein unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the Respondent's obligations under this Consent Order in accordance with this section.
- 11.2 For the purpose of this Consent Order, "Force Majeure" means an occurrence or

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nonoccurrence arising from causes not foreseeable, beyond the control of, and without the fault of the Respondent, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the Respondent's diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the Respondent's actions or omissions.

- 11.3 The Respondent shall notify the DEQ, by telephone, within forty-eight (48) hours of discovering any event that causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or causes of delay, the measures taken by the Respondent to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay.
- 11.4 Failure of the Respondent to comply with the notice requirements of Paragraph 10.3, above, shall render this section void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of Paragraph 10.3.
- 11.5 If the Parties to this Consent Order agree that the delay or anticipated delay was beyond the control of the Respondent, this may be so stipulated and the parties to this Consent Order may agree upon an appropriate modification of this Consent Order. If the Parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X, Dispute Resolution, of this Consent Order. The burden of proving that any delay was beyond the reasonable control of the Respondent, and that all the requirements of this section have been met by the Respondent, is on the Respondent.

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- 11.6 An extension of any given compliance date based upon a particular incident does not necessarily mean that the Respondent qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

XII. GENERAL PROVISIONS

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

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ownership and/or operation of the Site. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.

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

XIII. TERMINATION

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

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- b. a statement that all required information has been reported to the District Supervisor;
- c. confirmation that all records required to be maintained pursuant to this Consent Order are being maintained by the City; and
- d. additional relevant information requested by the Office Chief.

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

city-of-flint-bray-road-co-2-19-2014 (2)

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XIII. SIGNATORIES

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

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

By: _____

Dan Wyant
Director

Name: _____

Title: _____

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

Date: _____

Date: _____

APPROVED AS TO FORM:

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

Date: _____

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, October 15, 2015 4:56 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: PRELIMINARY & DELIBERATIVE. NOT SUBJECT TO FOIA: Status of Action Steps

Liane,

Here is today's summary of the status of action steps assigned to me:

Action Step 6: Approve Flint plan for waterline:

The city of Flint and Genesee County received DEQ's approval to place the pipeline into service based on the absence of total coliform bacteria in the pipeline after 2 rounds of sampling.

Action Step 18: Contact KWA to identify any bottlenecks we need to remove:

Additional information was forwarded to me today from Chris Clamphitt concerning two Violation Notices issued by the Lapeer County Road Comm. within the past week against KWA regarding soil erosion, improper restoration, etc. in certain areas of construction. I will forward you the e-mail thread with attached Violation Notice in a separate e-mail. If not resolved, this latest development could cause further delay in KWA pipeline project.

Action Step 19: Expedite 399 plan and phosphate plan:

Nothing received from city or their consultant as of COB today. I will contact both parties tomorrow morning for a status update.

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

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Friday, October 09, 2015 3:25 PM
To: Busch, Stephen (DEQ)
Cc: Krisztian, George (DEQ); Dykema, Linda D, (DHHS)
Subject: Preliminary and deliberate information not subject to FOIA
Attachments: NONPUBLIC SCHOOLS IN GENESEE COUNTY.pdf

Steve,

Here is a list of Non-Public schools in Genesee County. There are only a few that are in Flint but all of the contact data is there. I have started working on a priority list and will have an update for you on Monday.

--

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

NONPUBLIC SCHOOLS IN GENESEE COUNTY

Alpha Montessori School, Inc.

(located in Flint Community Schools)

Dolores Glynn, Director

310 East Third Street, Flint 48502 239-4689

Grades Pre K, K and Toddler

FAX: 239-8253

Fairhaven Seventh-Day Adventist School

(located in Beecher)

John Adeogun, Principal

1379 West Louis Avenue, Flint 48505-1028 785-4024

Grades Pre K-12

FAX: 785-6207

Faith Baptist Schools

(located in Davison)

Larry Nagengast, Administrator

7308 East Atherton Road, Davison 48423 653-9661

Grades Pre K-12

FAX: 658-0087

Faithway Christian School

(located in Atherton)

Domenic Centofanti, Administrator

Laura Walthers, Assistant Principal

1225 South Center Road, Burton 48509 743-0055

Grades Pre K-12

FAX: 743-0033

First Flint Seventh-Day Adventist

(located in Carman-Ainsworth)

Jennifer Goulet, Principal

G-4285 Beecher Road, Flint 48532 732-0230

Grades K-8

FAX: 732-0230

Genesee Academy

(located in Swartz Creek)

Imad Tibi, Principal

9447 Corunna Road, Swartz Creek 48473 250-7557

Grades Pre K-10

FAX: 250-7558

Genesee Christian Elementary School

(located in Bentley)

Rebecca Gebhart, Principal

1114 South Genesee Road, Burton 48509 743-3110

Grades Pre K-5

FAX: 743-3177

Genesee Christian High School, Junior High School, and Main Office

(located in Bentley)

Robert Buchalski, Administrator/H.S. Principal

1223 South Belsay Road, Burton 48509 743-3108

Grades 6-12

FAX: 743-3230

Good Shepherd Lutheran Elementary

(located in Bentley)

David Backus, Principal

2020 South Belsay Road, Burton 48519 742-1131

Grades K-8

FAX: 742-9907

Holy Family School

(located in Grand Blanc)

Michele Jahn, Principal

215 Orchard Street, Grand Blanc 48439 694-9072

Grades Pre K-8

FAX: 694-9405

Holy Rosary Catholic School

(located in Kearsley)

Debbie Hodges, Principal

5191 Richfield Road, Flint 48506 736-4220

Grades K-8

FAX: 736-1064

Kingdom Academy

(located in Westwood Heights)

Michael Lewis, Administrator/Principal

G-3196 West Pasadena Avenue, Flint

Mail - PO Box 310528, Flint 48531 732-5880

Grades Pre K-8

FAX: 732-6984

Luke M. Powers Catholic High School

(located in Flint Community Schools)

Thomas Furnas, Principal

G-2040 West Carpenter Road, Flint 48505 591-4741

Grades 9-12

FAX: 591-1794

Montessori Academy of Davison

(located in Davison)

Jeannie Summers, Director

326 West Bay Street, Davison 48423 653-1131

Grades Pre K-K

FAX: 658-9030

NONPUBLIC SCHOOLS IN GENESEE COUNTY

St. John's Evangelist Catholic School

(located in Fenton)

Katherine White, Principal

514 Lincoln Street, Fenton 48430 629-6551

Grades Pre K-8

FAX: 629-2213

The Valley School

(located in Swartz Creek)

Kaye Panchula, Head of School

5255 South Linden Road, Swartz Creek 48473 655-0841

Grades Pre K-12

FAX: 655-0853

St. John Vianney Catholic School

(located in Flint Community Schools)

Mary Allen, Principal *LARA DANIEL*

2319 Bagley Street, Flint 48504 235-5687

Grades Pre K-8

FAX: 235-2811

Waterbrook Christian Academy

(located in Davison)

8031 East Court Street, Davison 48423 653-9701

Grades Pre K-10

FAX: 412-5700

St. Mary Catholic School

(located in Mt. Morris)

Diane Martindale, Principal

11208 North Saginaw Street, Mt. Morris 48458 686-4790

Grades Pre K-8

FAX: 686-4749

St. Paul Lutheran School

(located in Flint Community Schools)

Mary Lynn Buck, Principal

402 South Ballenger Highway, Flint 48532 239-6733

Grades Pre K-8

FAX: 239-5466

St. Pius X

(located in Carman-Ainsworth)

R.J. Kaplan, Principal

G-3139 Hogarth Avenue, Flint 48532 235-8572

Grades Pre K-8

FAX: 235-2675

St. Robert Elementary

(located in Flushing)

Susan Sharp, Principal *PATRICK DOWSETT*

214 East Henry Street, Flushing 48433 659-2503

Grades Pre K-8

FAX: 659-4002

St. Thomas More Academy

(located in Davison)

Dan LeBlanc, Principal

6456 East Bristol Road, Burton 48519 742-2411

Grades K-12

FAX: 742-4803

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, October 27, 2015 4:57 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: Action Steps Update

Liane,

Below is an update on the Action Steps assigned to me:

Action Step 20: Review permit appl. And issue permit for PO4 equipment:

Received updated dosage, pump specs and cut-sheets for PO4 product at COB today. A quick glance at the submittal shows most of the requested information has been provided except for NSF 60 certification and max dose. I will cross reference the NSF website tomorrow morning to verify proper certification and max dose. If this checks out, I will proceed with issuance of the Act 399 permit, otherwise, the consultant will need to provide us with the NSF Standard 60 certification and max dose info.

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, October 20, 2015 4:06 PM
To: Krisztian, George (DEQ)
Cc: Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: Action Steps Update

George,

Below is an update of the Action Steps assigned to me for the week of October 19th, 2015.

Action Steps No. 19 and 20 – Review corrosion control treatment plan and get any EPA comments (step 19) and Review construction permit application and issue construction permit for phosphate equipment (step 20):

The corrosion control treatment plan (CCTP) and permit application was received late last Friday and were reviewed. Our review comments were provided to Flint's consultant (LAN). The CCTP was forwarded to EPA last Friday and their comments were received yesterday. A conference call was held this morning between our staff and Daren Lytle and Michael Schock of EPA to discuss the main comments (EPA's and DEQ's) to confirm that both agencies concur with the design and proposed corrosion control dosages. We are currently preparing a revised set of comments, based on our discussion with EPA. The revised comments will be sent to EPA to confirm concurrence before sending to LAN. An Act 399 permit will be issued to the city of Flint to install CCT following receipt of revised plans, specs, and – as needed – permit application that addresses the revised review comments.

Action Step No. 21 – Review Stand-by Operation of Flint WTP with the city of Flint:

No updates. Action will be taken on this step tomorrow and, as needed, through the remainder of the week.

Action Step No. 24 - Work with KWA and other agencies to address bottleneck issues:

No updates. Action may include discussing our concern with MDOT regarding the "no construction traffic" currently being imposed on N-S secondary roads and issuance of the spring weight restrictions by the Lapeer County Road Commission. We will need to see what steps MDOT may consider taking in working with the road commission to ease these restrictions that could otherwise cause delay in completing installation of the KWA pipeline. An appropriate MDOT contact will need to be provided to initiate this step.

Action Step No. 25 - Verify city of Flint distribution operations under DWSD/GLWA service:

No updates. Action will be taken to verify this step tomorrow and, as needed, through the remainder of the 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: Tuesday, October 20, 2015 2:32 PM
To: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: FW: Flint Corrosion Control Plans and MDEQ Preliminary Comments.pdf
Attachments: Flint Phosphate Calculations.pdf; MDEQ Preliminary Comments with replies (2).pdf; IBC tote scale with containment.pdf

Samir's response to our comments...

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

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

Hi Mike,

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

Thanks.

Samir F. Matta, PE
 Team Leader



1311 South Linden Road, Suite B • Flint, MI 48532
 2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
 D 517.819.2367 C 517.819.2367
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Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

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

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

Molecular weight of H_3PO_4 is 97.9913 g/mole

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

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

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

Proposed Operating Parameters

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

*Equivalent dosage to PO_4^{3-} dosage

Feed Rate Calculations

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

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

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

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

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

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

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

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

IBC TOTE SCALE

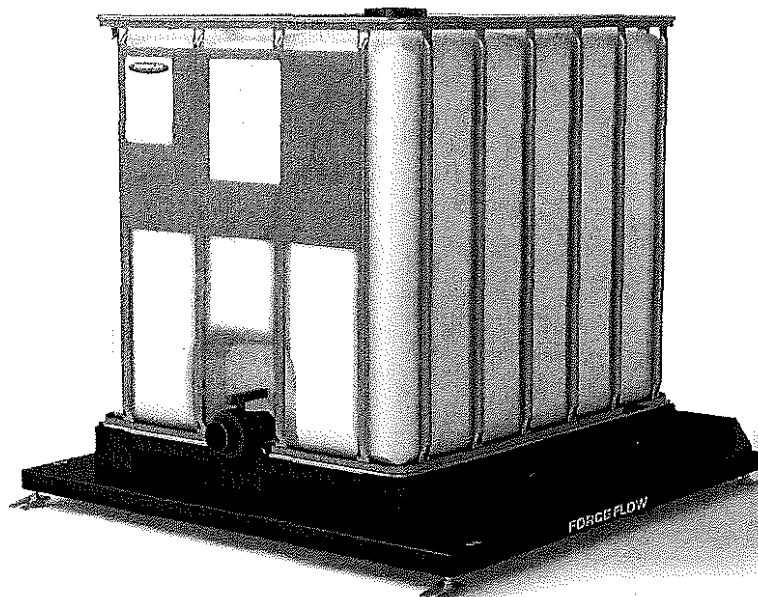
FOR CHEMICAL IBC TOTES

Safely track
chemical usage
and tank levels

Warn of dangerous
over and under-
feed conditions

Prevent system
from running
empty

4-20mA remote
monitoring reduces
operator exposure
to chemicals



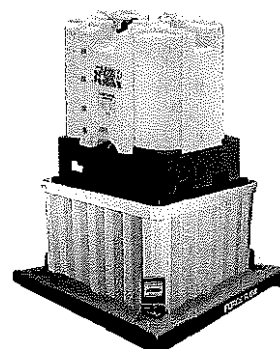
NO FINGER POINTING.
NO FIRE PRINT.™



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

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

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



FORCE FLOW

IBC TOTE SCALE

MODELS AND ORDERING INFORMATION

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

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

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



WIZARD 4000®



SOLO® G2



HYPO TRACK®



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

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



WIZARD 4000®



SOLO® G2



HYPO TRACK®



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

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



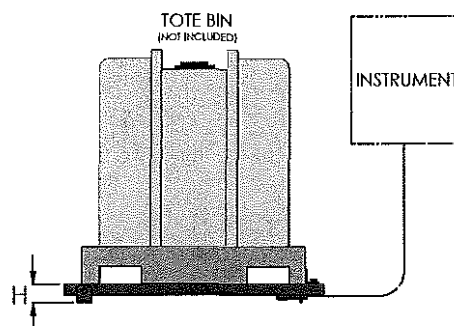
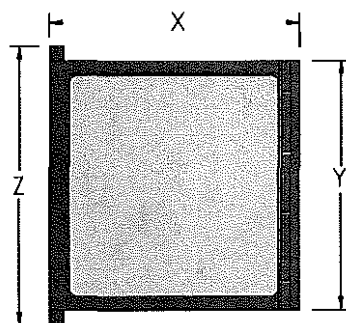
CENTURY®



SOLO XT®



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



SPECIFYING GUIDELINES:

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

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

FORCE FLOW

MODEL NUMBERS (for Load Cell & Platform)

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

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

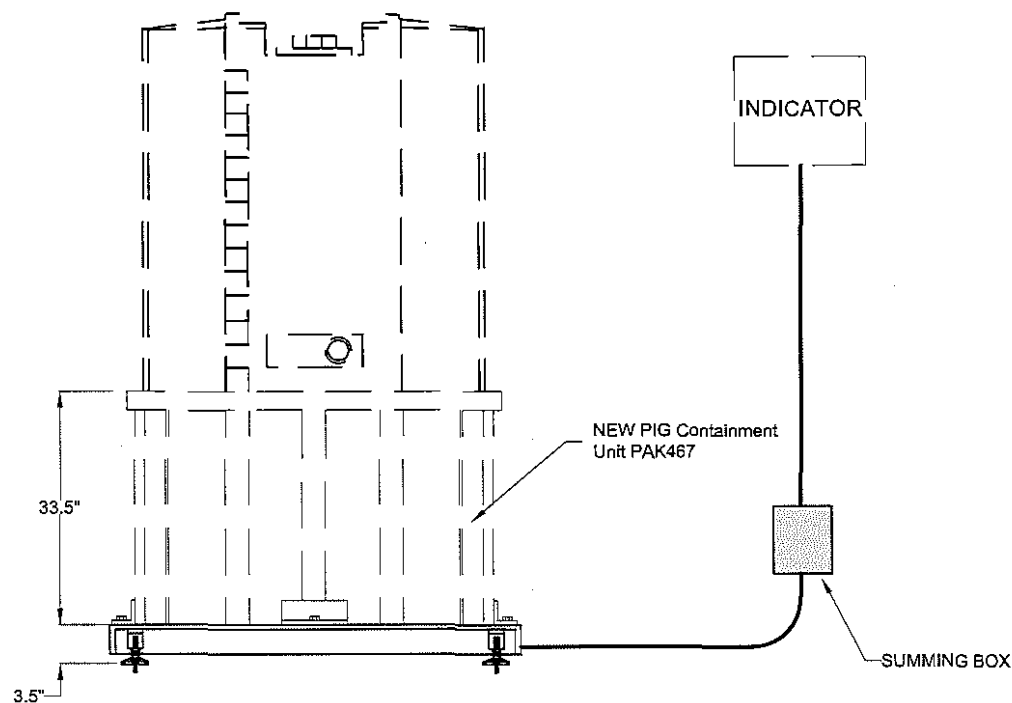
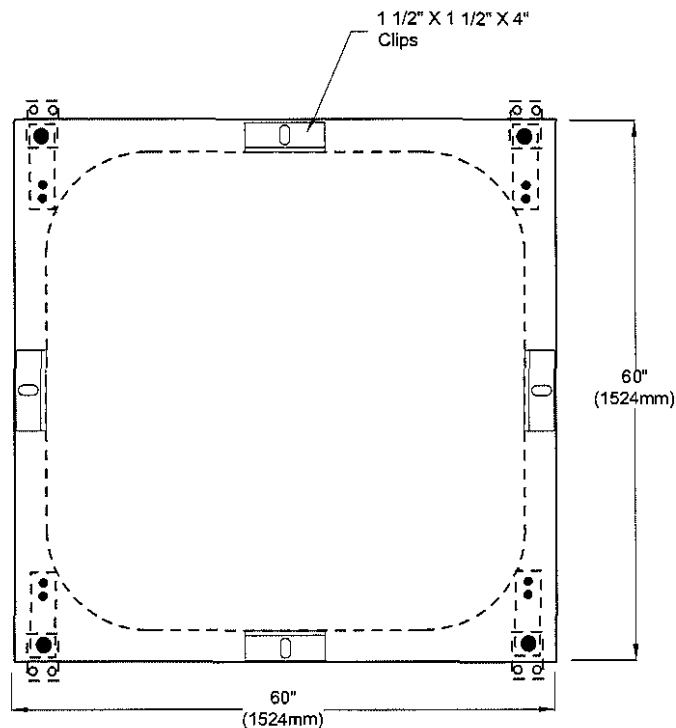
MODEL NUMBER (for SOLO 1000 Indicator)

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

MODEL NUMBER (Containment Unit)

PAK467 400 gal. NEW PIG Poly IBC Containment Unit

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

**INSTALLATION NOTE:**

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

FORCE FLOW

2430 Stanwell Dr, Concord, Ca 94520 USA
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PA_EMAIL_SUBMITTAL FORMS/Autocad Drawings/31431 HA Tote Bin Scale 60 Containment.dwg

HI-ACCURACY ELECTRONIC
 60" TOTE BIN SCALE
 CONTAINMENT

Drawn by: KBV

Date: 1/23/09

Revised: 4/13/10

Scale:

Drawing Number

31431

---NOT SUPPLIED BY FORCE FLOW---
For use with Force Flow Scale Model 60-DR100TCH4



New Pig

Your partner for a clean
and safe workplace.

1-800-HOT-HOGS® (468-4647)

Product Data Sheet

Item Number: PAK467

Item Name: PIG® Poly IBC Containment Unit

Load Capacity UDL:

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

Sump Capacity:

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

Options Available:

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

Color: White/Black

Description:

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

Application:

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

Product Features:

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

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

Composition:

- Sump - Polyethylene
- Grates - Injection Molded Polyethylene

This product helps you comply with:

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

Additional Specifications:

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

Disclaimers:

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

PDS generated: Jul 14, 2008

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

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, October 22, 2015 9:38 AM
To: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: FW: Preliminary and Deliberative: RE: Flint Nail Test

Steve,

The city has also confirmed that the phosphate residual coming in is measured as product (PO₄)⁻³. I will follow-up with Samir, confirm receipt of the phosphate compound cut-sheet (NSF and max dose info) and proper sizing of the chemical feed pumps prior to issuing the Act 399 permit.

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

From: Brent Wright [<mailto:bwright@cityofflint.com>]
Sent: Thursday, October 22, 2015 8:18 AM
To: Prysby, Mike (DEQ)
Cc: Samir Matta; Michael Glasgow
Subject: Re: Preliminary and Deliberative: RE: Flint Nail Test

It is being measured as (PO₄)⁻³.

On Oct 22, 2015 8:00 AM, "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov> wrote:

Samir, Brent

Is the phosphate concentration 1.24 mg/l being measured as (PO₄)⁻³ or as P ?

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

From: Matta, Samir [mailto:SFMatta@lan-inc.com]
Sent: Wednesday, October 21, 2015 10:34 PM
To: Prysby, Mike (DEQ)
Subject: FW: Flint Nail Test

Hi Mike,

Please see below from Brent as we discussed.

Thanks.

Samir F. Matta, PE

Team Leader



1311 South Linden Road, Suite B • Flint, MI 48532

2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901

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www.lan-inc.com • sfmatta@lan-inc.com

From: Brent Wright [mailto:bwright@cityofflint.com]
Sent: Wednesday, October 21, 2015 11:35 AM
To: Green, Warren
Cc: Matta, Samir; Howard Croft (hcroft@cityofflint.com); Lawrence, Charles; Hansen, Jeff; mglasgow@cityofflint.com; Nakashima, Jeremy
Subject: Re: Flint Nail Test

I have sent an email to Mary Semegen (head of DWSD water quality) regarding the feed rate coming from the Burtchville plant. I will inform you of her response upon receiving it.

From: Brent Wright [<mailto:bwright@cityofflint.com>]

Sent: Wednesday, October 21, 2015 7:51 AM

To: Green, Warren

Cc: Lawrence, Charles; Hansen, Jeff; Matta, Samir; mglasgow@cityofflint.com; Nakashima, Jeremy

Subject: Re: Flint Nail Test

On another note we are seeing a 1.24ppm of phosphate from DWSD. I was under the understanding they were only feeding a .5ppm. Any thoughts on what we should be feeding.

Thanks

On Wed, Oct 21, 2015 at 8:47 AM, Brent Wright <bwright@cityofflint.com> wrote:

Agree I see no difference.

On Wed, Oct 21, 2015 at 8:29 AM, Green, Warren <jwgreen@lan-inc.com> wrote:

Agree

J. Warren Green

On Oct 20, 2015, at 11:40 PM, Lawrence, Charles <cflawrence@lan-inc.com> wrote:

I don't know what the rest of you guys think, but looks like no difference between DWSD and Flint to me.

From: Hansen, Jeff

Sent: Tuesday, October 20, 2015 3:29 PM

To: Green, Warren

Cc: Matta, Samir; Brent Wright (bwright@cityofflint.com); 'mglasgow@cityofflint.com'; Lawrence, Charles; Nakashima, Jeremy

Subject: Flint Nail Test

After 1 week....

Jeffrey R. Hansen, PE

Project Manager

<image001.gif>

1311 South Linden Road, Suite B • Flint, MI 48532

T 810.820.2682 **C** 810.333.3201

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, October 16, 2015 4:06 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Liane,

Below is an update of the Action Steps assigned to me.

Action Step 6 – Flint pipeline is ready to be placed into service.

Action Step 18 - Contact KWA to identify any construction bottlenecks

No updates today – this Action Step will be carried over next week to continue working With KWA towards addressing the bottlenecks

Action Step 19 – Expedite 399 Plan and Phosphate Plan

Corrosion control proposal received electronically from LAN this morning (without 399 application). Pat and I are reviewing the proposal and preparing comments. The proposal was forwarded to Darren Lytle and Michael Schock from EPA for their review with comments requested by Monday morning. Darren acknowledged receipt of the proposal. LAN is hand delivering a full sized set of the proposal along with a signed permit application later this afternoon.

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

Samir's updated proposal sent Friday nite...

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

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

Hi Mike,

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

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

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

Thanks for your prompt and quick response to our submittal.

Samir F. Matta, PE
 Team Leader



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

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Issued for: Permitting
Issue Date: October 16, 2015



PLANNING
ENGINEERING
PROGRAM MANAGEMENT

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

INDEX OF SHEETS

SHEET No.	SHEET TITLE
GENERAL	
G-1	CORROSION CONTROL
G-2	INDEX OF SHEETS, SITE OVERVIEW, AND GENERAL NOTES
G-3	SYMBOLS AND ABBREVIATIONS
PROCEDURE	
P-1	CONSTRUCTION PROCEDURES
P-2	PUMP STATION PLAN, ELEV. 725.89
P-3	PUMP STATION PLAN, ELEV. 725.89
P-4	PUMP STATION PLAN, ELEV. 725.89
P-5	PHOSPHATE FEED SYSTEM SCHEMATICS
P-6	PHOSPHATE FEED SYSTEM DETAILS AND BILL OF MATERIALS
ELECTRICAL	
E-1	ELECTRICAL SYMBOLS AND ABBREVIATIONS
E-2	CONSTRUCTION - ELECTRICAL PLAN
E-3	PUMP STATION - ELECTRICAL PLAN, ELEV. 725.89

Water Treatment Plant Site
(N.T.S.)

GENERAL NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING PUBLIC AND PRIVATE UTILITIES. UTILITY INFORMATION FROM ANY PLANS IS NOT GUARANTEED TO BE ACCURATE OR COMPLETE. THE CONTRACTOR SHALL COORDINATE WITH ALL AFFECTED UTILITY COMPANIES TO DETERMINE THE LOCATION, DEPTH, AND TYPE OF ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING UTILITIES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO UTILITIES CAUSED BY CONSTRUCTION OPERATIONS.
- NOTIFICATION OF UTILITIES: CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST FORTY-FOUR (48) HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- THE CONTRACTOR SHALL OVEHEAD UTILITY COMPANY AND THE CITY AT LEAST FIVE (5) BUSINESS DAYS PRIOR NOTICE OF PROPOSED UTILITY SHUTDOWNS. CONTRACTOR SHALL NOT OPERATE ON ANY VALVES OR SHUTDOWNS ANY UTILITIES ONLY THE UTILITY OWNERS AND THE CITY SHALL OPERATE VALVES AND SHUTDOWNS UTILITIES. CONTRACTOR SHALL PROVIDE THE CITY WITH COPIES OF UTILITY OWNERS' WRITTEN APPROVAL OF PROPOSED SHUTDOWNS.
- CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING CONSTRUCTION OF THIS PROJECT, AND FOR THE SAFETY OF ALL PERSONS AND/OR PROPERTY ON SITE.
- THE SAFE AND ORDERLY PASSAGE OF PEDESTRIAN AND VEHICULAR TRAFFIC SHALL BE PROVIDED WHERE OPERATIONS AFFECT PUBLIC THROUGHWAYS AND ADJACENT PROPERTY.
- NO ROADS OR ENTRANCES SHALL BE CLOSED BY CONSTRUCTION. CONSTRUCTION DEBRIS OR EQUIPMENT FOR AN EXTENDED PERIOD OF TIME WITHOUT PRIOR APPROVAL FROM THE CITY OF FLINT. ALL ROADWAYS SHALL BE OPEN TO TRAFFIC AT THE CONCLUSION OF EACH WORK DAY WITH PROPER TRAFFIC SIGNS AND BARRICADES ERECTED FOR SAFETY, UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS AND REQUIREMENTS.
- ALL PROPERTY MARKERS AND REFERENCE MARKERS SHALL BE CAREFULLY PRESERVED DURING CONSTRUCTION UNTIL THEIR LOCATION HAS BEEN WITNESSED OR OTHERWISE TIED IN BY AN AUTHORIZED AGENT OR SURVEYOR.
- INCIDENTAL COSTS TO ALL ITEMS SHOWN ON THE PLANS OR IN THE SPECIFICATIONS OR THAT WHICH CAN BE INCURRED AS REQUIRED FOR THE WORK, BUT DO NOT APPEAR IN THE SUMMARY OF QUANTITIES ON SCHEDULES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THIS PROJECT.
- CONTRACTOR SHALL MAINTAIN ADEQUATE PROTECTION FOR THE PROPOSED BRIDGES, GUTTERS, EROSION AND OTHER REQUIRED PROTECTION OF ALL UTILITIES, BRIDGES AND ROADWAYS BEFORE CONSTRUCTION BEGINS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE ROADWAYS AND ASSOCIATED STRUCTURES AND SHALL MAKE REPAIRS AS NECESSARY TO THE SATISFACTION OF THE OWNER. AT THE CONTRACTOR'S EXPENSE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ADEQUATE SIGNAGE AND WARNING DEVICES TO INFORM AND PROTECT THE PUBLIC.
- PROTECTING CONCRETE: CONTRACTOR SHALL PROTECT ALL NEW CONCRETE WORK FROM BEING MARKED, DEFACED, OR DAMAGED ON ITS SURFACE BY PASSERS-BY, REPLACING ANY CONCRETE WORK SO MARKED SHALL BE AT THE CONTRACTOR'S EXPENSE.
- ALL EXISTING FACILITIES SHALL BE KEPT IN SERVICE DURING CONSTRUCTION, EXCEPT WHERE PERMISSION IS OTHERWISE GRANTED BY THE CITY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS, METHODS, PROCEDURES, TECHNIQUES AND SEQUENCES OF CONSTRUCTION INCLUDING SAFETY ON THE JOB SITE, NEITHER THE PROFESSIONAL ACTIVITIES OF THE ENGINEER NOR THE PRESENCE OF THE ENGINEER AT THE CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR OF HIS OBLIGATIONS, DUTIES, AND RESPONSIBILITIES, INCLUDING ANY HEALTH AND SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES.
- CONTRACTOR SHALL PLACE GRADE AND MAINTAIN DESIGN STONE WALLS AS NEEDED TO PROVIDE SAFE PEDESTRIAN WALKWAYS WHERE ABRUPT CHANGES IN GRADE OCCUR AT ALL TIMES DURING THE CONSTRUCTION PROJECT, AS DIRECTED BY THE CITY'S REPRESENTATIVE.
- CONTRACTOR SHALL PROVIDE SLOSH PROTECTION UNTIL FINAL SURFACE RESTORATION.
- SEVERAL CONSTRUCTION ITEMS FOR THIS PROJECT INVOLVE MODIFICATIONS TO EXISTING FACILITIES, ELEVATIONS, DETAILS, ETC. HAVE BEEN SHOWN BASED UPON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, COORDINATES, AND ELEVATIONS BEFORE PROCEEDING WITH THE WORK, AND SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IMMEDIATELY. CONTRACTOR SHALL MAKE ADJUSTMENTS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE CITY.
- PAVING TO REMAIN SHALL BE PROTECTED FROM DAMAGE. IF DAMAGED, PAVING SHALL BE REPLACED PROMPTLY AT NO ADDITIONAL COST TO THE CITY.
- ALL DISTURBED GRASS AREAS SHALL BE RESEED/REVEGETATED.
- ALL EXCAVATIONS AND TRENCHES SHALL COMPLY WITH SPECIFICATION SECTION 0206 - TRENCH SAFETY SYSTEM, AND OTHER REQUIREMENTS FOR EXCAVATIONS CONTAINED IN 2013 CITY PART 100A, SUPPLEMENT.
- THE CONTRACTOR SHALL USE CARE IN GRADING OR EXCAVATING NEAR ANY AND ALL EXISTING TRENCHES, WHICH ARE NOT INDICATED TO BE REMOVED, ANY DAMAGE TO THESE EXISTING ITEMS CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE CITY AT THE CONTRACTOR'S EXPENSE.
- BURNING OR INCINERATION OF RUBBER IS NOT ALLOWED ON SITE.
- DISPOSAL OF WASTEWATER: REFER TO REQUIREMENTS IN SPECIFICATION PART 0206 - WASTE MATERIAL DISPOSAL. NOTIFY ENGINEER IMMEDIATELY IF CONTAMINATED SOIL OR GROUND WATER ARE ENCOUNTERED. DISPOSAL OF SOILS AND GROUNDWATERS SHALL BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS. REFER TO REQUIREMENTS IN SPECIFICATION 0206 - WASTE MATERIAL DISPOSAL AND DISPOSAL.

Flint WTP
Phase II, Segment IV
Corrosion Control
Flint MI 48905



Lockwood, Andrews & Associates, Inc.
A U.S. A. FIRM
CORROSION CONTROL
10000 Woodward Avenue
Suite 100
Flint, MI 48905
Tel: 810-332-2482 Fax: 810-332-2703

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

FILE LOG

NO.	DESCRIPTION	DATE



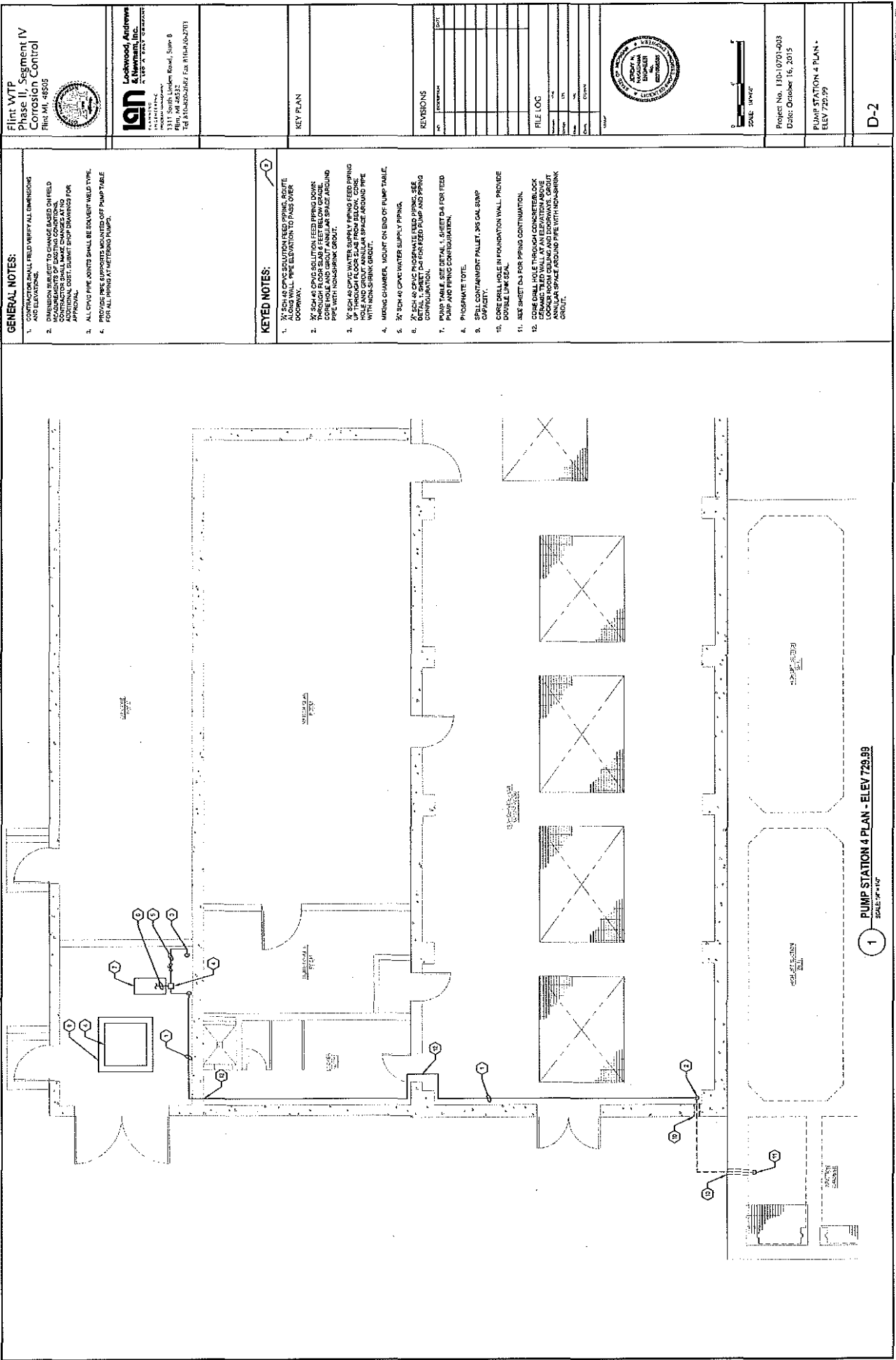
Project No. 130-1070-003
Date: October 16, 2015

INDEX OF SHEETS, SITE OVERVIEW
AND GENERAL NOTES

G-2

[illegible]

CONTROL STATION 2 -
PLANS

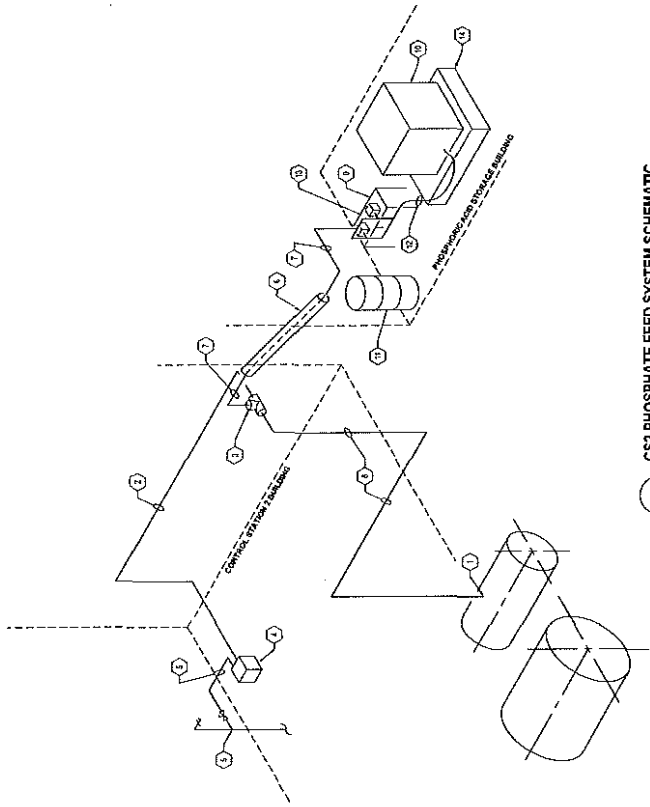


GENERAL NOTES:

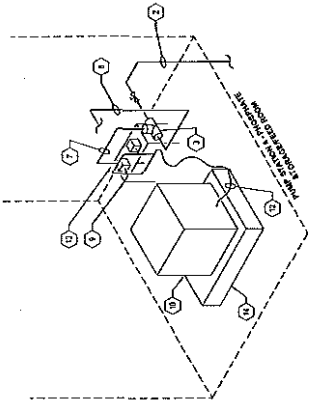
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. DIMENSION SUBJECT TO CHANGE BASED ON FIELD MEASUREMENTS OF EXISTING CONDITIONS. CONTRACTOR SHALL MAKE CHANGES AT NO ADDITIONAL COST. SUBMIT SHOP DRAWINGS FOR APPROVAL.
3. ALL CIVIC PIPE JOINTS SHALL BE SOLVENT WELD TYPE.
4. PROVIDE FIVE (5) JOINTS REQUIRED ON PUMP-TABLE END, ALL JOINTS AT METERS IN WORK.

KEYED NOTES:

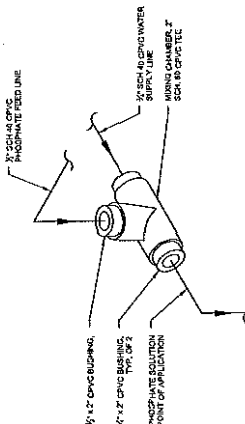
- [illegible]



1 CS2 PHOSPHATE FEED SYSTEM SCHEMATIC



2 PUMP STATION 4 PHOSPHATE FEED SYSTEM SCHEMATIC



MIXING CHAMBER DETAIL

[illegible][illegible]

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. DIMENSION SURVEY TO CHANGE BASED ON FIELD MEASUREMENTS OF EXISTING CONDITIONS. CONTRACTOR SHALL MAKE CHANGES AT NO ADDITIONAL COST. URBEST PREP DRAWINGS FOR APPROVAL.
3. ALL CPVC PIPE JOINTS SHALL BE SOLVENT WELD TYPE.
4. PROVIDE PIPE SUPPORTS MOUNTED OFF PUMP TABLE.

Len
A DAY COMPANY
LOCKWOOD, ANDREWS
& NEWMAN, INC.

KEY PLAY

REVISIONS

5	McGraw-Hill

+

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Figure 1

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Project No. 1

Date: October 19, 2014

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AND BILL ON

D-6



Lockwood, And news & Newman, Inc.
A WOODWARD CLYDE COMPANY

KEY PLAY

REV	DESCRIPTION	DATE
1	Initial design	10/1/00
2	Revised design	10/1/00
3	Final design	10/1/00
4	Revised design	10/1/00
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109	Final design	10/1/00
110	Revised design	10/1/00
111	Final design	10/1/00

[illegible]

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

CONTROL STATION 2 -
ELECTRICAL PLAN

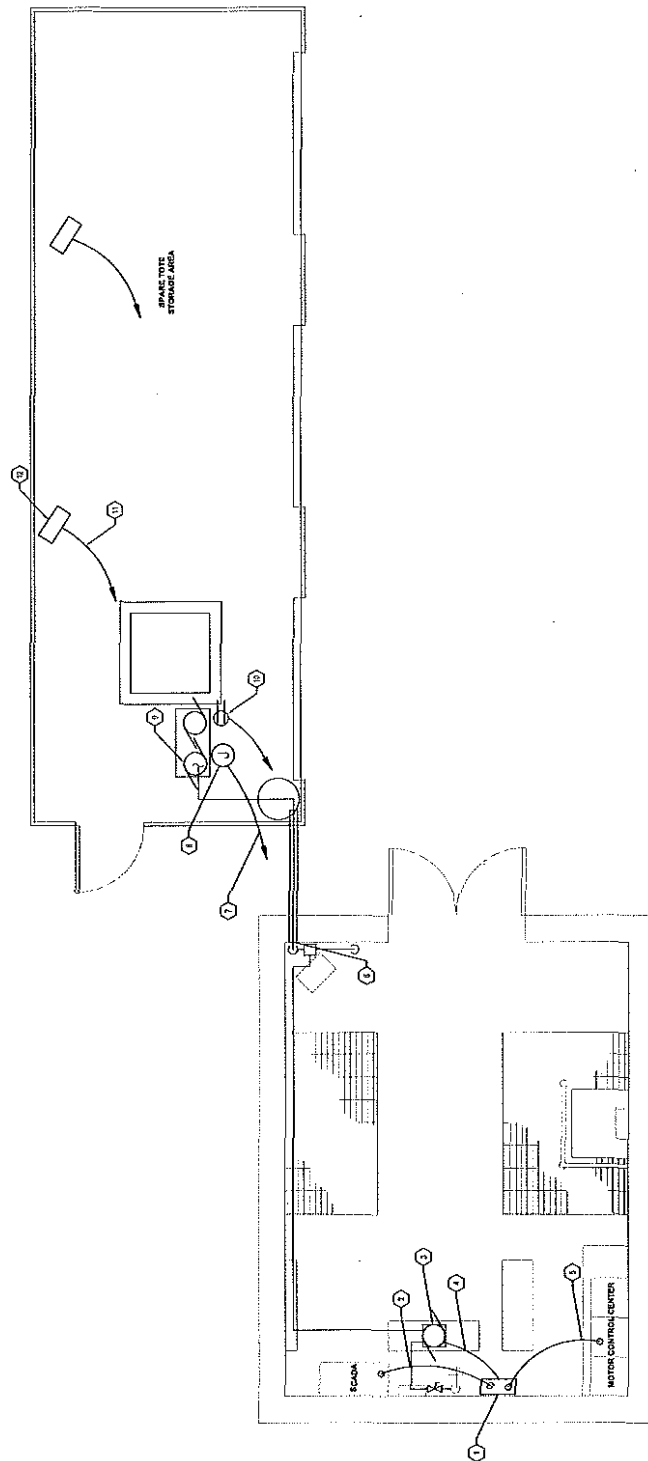
13

GENERAL NOTES:

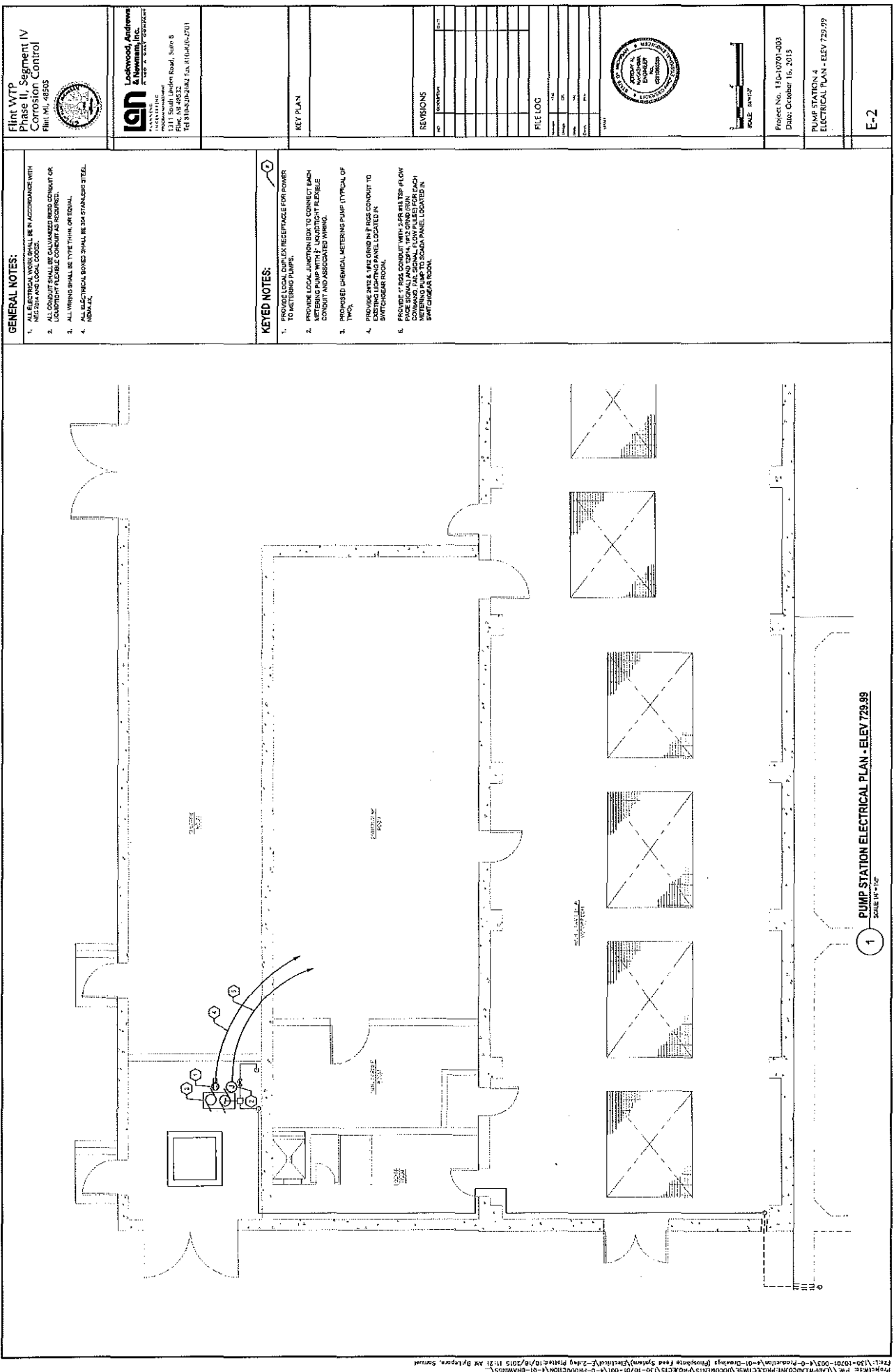
1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH NEC 2014 AND LOCAL CODES.
2. ALL CONDUIT SHALL BE GALVANIZED RIGID CONDUIT OR LIQUIDTIGHT FLEXIBLE CONDUIT AS NOTED.
3. ALL WIRING SHALL BE TYPE THHN, OR EQUAL.
4. ALL ELECTRICAL BOXES SHALL BE 304 STAINLESS STEEL NEMA 4X.

KEYED NOTES:

- [illegible]



1 CONTROL STATION ELECTRICAL PLAN
SCALE: 3/8" = 1'-0"



GENERAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH NEC 2014 AND LOCAL CODES.
2. ALL CONDUIT SHALL BE GALVANIZED RIGID CONDUIT OR LIQUIDTIGHT FLEXIBLE CONDUIT AS REQUIRED.
3. ALL WIRING SHALL BE TYPE THHN OR EQUIVAL.
4. ALL ELECTRICAL BOXES SHALL BE 304 STAINLESS STEEL NEMA 4X.

KEYED NOTES:

1. PROVIDE LOCAL SUPPLY RECEPTACLE FOR POWER TO METERING PUMPS.
2. PROVIDE LOCAL JUNCTION BOX TO CONNECT EACH METERING PUMP WITH P-1 LAUGHTIGHT FLEXIBLE CONDUIT AND ASSOCIATED WIRING.
3. PROVIDE CHEMICAL METERING PUMP TYPICAL OF TWO'S.
4. PROVIDE 2X12, 1" X1/2" DRING IN P RGS CONDUIT TO EXISTING LIGHTING PANEL LOCATED IN SWFT CHASER ROOM.
5. PROVIDE 1" RGS CONDUIT WITH 2/0R #12 TSP FLOW PACE SIGNAL AND 12M1 #12 DRING (RUN UPWARD) FROM SIGNAL FLOW PUMP FOR EACH METERING PUMP. PROVIDE LOCAL SUPPLY RECEPTACLE IN SWFT CHASER ROOM.

KEY PLAN

REVISIONS

01/01/2019	01/01/2019



Figure 1: Schematic representation of the experimental design. The diagram shows a sequence of events: 'Stimulus presentation' (a box with a question mark), 'Response' (a box with a question mark), 'Feedback' (a box with a question mark), and 'Inter-trial interval' (a box with a question mark). The sequence is repeated for 'Trial 1' and 'Trial 2'.

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

PUMP STATION 4
ELECTRICAL PLAN - ELEV 729.99

E-2

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 7:56 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Cc: Sygo, Jim (DEQ)
Subject: Preliminary and Deliberative, Not subject to FOIA: Information request for Draft report
Importance: High

I need some information rather quickly.

- 1) The first thing that I need is an explanation of why there were data points that were excluded from the Lead and Copper study for Flint. I also need to know the date(s) of the study(s) where data was excluded and what that data was. A copy of the report would be helpful. I believe I know the answer, I just need to formalize the answer.
- 2) I need a copy of Steve's memo indicating that "optimized" corrosion controls were in place. I understand the phrase "optimized" was an unfortunate word usage but apparently the memo contains that language and I need to be able to put that into context. If my understanding of the word choice in the memo is incorrect I still need a copy of the memo that is causing the buzz.

Please make these high priority items.

Thank you
George

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

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Monday, October 12, 2015 11:37 AM
To: Dayne Walling; Natasha Henderson (nhenderson@cityofflint.com); Howard Croft (hcroft@cityofflint.com)
Cc: Wyant, Dan (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA); Lyon, Nick (DHHS); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Preliminary and Deliberative: Not subject to FOIA Weekly meetings
Importance: High

Mr. Mayor,

I would like to schedule weekly meetings with you and your key staff so that we can ensure that we have a coordinated effort in resolving the water issue. I would like for the initial meetings to be face to face and I, along with others, will come to Flint for these.

If possible I would like the first meeting to be either Tuesday or Wednesday of this week (10/13 or 10/14) and I would also like to ask for a tour of the Flint Water Treatment Plant.

Mary Beth Thelen will serve as the DEQ's point on coordinating these meetings. Can you please let us know who would be the appropriate contact on your end?

Thank you very much!
 George

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

Rennaker, Joanne (DEQ)

From: Groetsch, Kory J. (DHHS)
Sent: Friday, October 30, 2015 11:37 AM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Cc: Dykema, Linda D. (DHHS); Krisztian, George (DEQ); Bruneau, Michelle (DHHS)
Subject: Preliminary and Delibrative - not subject to FOIA - Infographic

Hi Liane and Steve,

Here is the infographic that we mentioned on Tuesday. This infographic has some information about adult exposure and putting it into a risk context.

[http://www.michigan.gov/documents/deq/deq-flint-water-2015-10-21 - Lead and your Body - Flint - no background 504124 7.pdf?20151030113128](http://www.michigan.gov/documents/deq/deq-flint-water-2015-10-21_-_Lead_and_your_Body_-_Flint_-_no_background_504124_7.pdf?20151030113128)

Do you think this infographic will answer the questions you have been getting about adult exposure? Do you think a factsheet with more detail about adult risk is needed?

Thank you,
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: Shaler, Karen (DEQ)
Sent: Wednesday, November 04, 2015 1:28 PM
To: Krisztian, George (DEQ); Shekter Smith, Liane (DEQ)
Cc: Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-11-09 Action Steps Week of November 2-6.docx

Attached is the updated version that now also includes the status from the last action steps document.

George: This is saved to the usual location on our S drive. Please work from this version when providing info for the next update to be submitted on November 9. Thanks.

From: Krisztian, George (DEQ)
Sent: Monday, November 02, 2015 1:36 PM
To: Shekter Smith, Liane (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6

I added the word "assist" to Action Item #3 to make it clear what our role was.

George

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

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6

Suggested draft Action Steps attached.

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Monday, November 02, 2015 1:36 PM
To: Shekter Smith, Liane (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: RE: 2015-10-26 DRAFT Action Steps Week of November 2-6
Attachments: 2015-10-26 DRAFT Action Steps Week of November 2-6.docx

I added the word "assist" to Action Item #3 to make it clear what our role was.

George

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

From: Shekter Smith, Liane (DEQ)
Sent: Monday, November 02, 2015 12:40 PM
To: Krisztian, George (DEQ)
Cc: Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: 2015-10-26 DRAFT Action Steps Week of November 2-6

Suggested draft Action Steps attached.

City of Flint Water Action Steps for Week of November 2 - 6

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
1.	Conduct After Action Plan	DEQ	George Krisztian	
2.	Introduce legislative changes to Part 54 of NREPA – Drinking Water Revolving Loan Fund	DEQ, Treasury, and EPA	Maggie Pallone George Krisztian Sonya Butler	
3.	Assist After Action Review Panel	DEQ	Madhu Anderson George Krisztian Karen Tommasulo	
4.	Staff hiring plan	DEQ	Jim Sygo Maggie Pallone George Krisztian	
5.	Finalize fiscal year 2017 budget request	DEQ	Maggie Pallone George Krisztian	
6.	Meeting(s) with school staff/management	DEQ	Jim Sygo Steve Busch Pat Cook Mike Prysby	
7.	Contact DHHS regarding lead education material for schools. Provide information as requested by DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
8.	Follow up with City regarding corrosion control treatment and their plans to address requirements and options provided for in DEQ letter.	DEQ and EPA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
9.	E-mail City regarding timing to install corrosion control now that the construction permit has been issued.	DEQ	Jim Sygo Steve Busch Pat Cook	

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
			Mike Prysby	
10.	Review MOR for Standby Operation of Flint Water Treatment Plant with city of Flint. Draft letter to City documenting Standby Operation Requiriements.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
11.	Work with Karegnondi Water Authority (KWA) and other agencies to address bottleneck issues. Check weekly for status update.	DEQ and KWA	Jim Sygo Steve Busch Pat Cook Mike Prysby	
12.	Continue evaluating city of Flint Service Line Record status and comparison to sampling pool.	DEQ and Flint	Jim Sygo Steve Busch Pat Cook Mike Prysby	
13.	Provide DHHS with any available cross-reference information regarding lead service lines and plumbing materials.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
14.	Develop childcare facility guidance or review DHHS related materials	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
15.	Develop draft sampling protocol for residential exposure assessment for DHHS.	DEQ and DHHS	Jim Sygo Steve Busch Pat Cook Mike Prysby	
16.	Make progress on drafting a generic school sampling guidance document for statewide distribution. Target audience: schools served by municipal water.	DEQ and LARA	Jim Sygo Steve Busch Richard Benzie	

FOIA EXEMPT AND ATTORNEY-CLIENT PRIVILEGE

Step No.	Action Step	Involved Parties	DEQ Point(s) of Contact	Status
17.	Attend meeting arranged by DHHS regarding Residential EBL Investigations and Water Testing	DEQ and DHHS	Jim Sygo Steve Busch Mike Prysby	

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, October 09, 2015 4:23 PM
To: Shekter Smith, Liane (DEQ)
Cc: Krisztian, George (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Re: Daily updates - DRAFT DELIBERATIVE - NOT SUBJECT TO FOIA

An acceptable procedure has been submitted and our concurrence has been conveyed.

Sent from my iPhone

On Oct 9, 2015, at 3:58 PM, Shekter Smith, Liane (DEQ) <SHEKTERL@michigan.gov> wrote:

Action Step #6 – Mike Prysby reported that Flint and Genesee County are coordinating their efforts to have the unused portion of the 72-inch transmission main (pipeline) available for service. An Act 399 permit does not apply here; however, he plans to offer the DEQ's concurrence with their proposed procedure – provided that it references adherence to AWWA's disinfection standard and the sampling protocol that was discussed. Mike spoke with the city and the county today to confirm that actions are underway.

Action Step #3 – Pat Cook drafted the sampling instructions and they are under review by DHHS, EPA and DEQ staff.

Action Step #1 – DEQ, DHHS, and city of Flint conference call today to discuss school prioritization.

From: Krisztian, George (DEQ)
Sent: Friday, October 09, 2015 7:07 AM
To: Shekter Smith, Liane (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: Daily updates
Importance: High

Hi Liane,

The Governor wants daily updates regarding the progress we are making on the Flint issue. Can you please provide me with a summary of the action steps that we have taken on a daily basis? The summary should not contain excessive detail, it should be something like:

- Steve Busch contacted Natasha Henderson at the City of Flint to get details on supplemental Phosphate Dosing
- Pat Cook/Mike P Analyzed Plans for flushing and pressure testing lines to make the switch back to GLWA
- Met with city of Flint officials to review actions to date and to create a list of next steps

The above examples are for illustrative purposes only

I need to have this summary each day no later than 4:30 PM. This is a hard deadline as we need to get the summary to the Governor by 5:00 PM. Please make sure that you copy Mary Beth and Karen.

Thank you!

George

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 09, 2015 3:59 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: RE: Daily updates - DRAFT DELIBERATIVE - NOT SUBJECT TO FOIA

Action Step #6 – Mike Prysby reported that Flint and Genesee County are coordinating their efforts to have the unused portion of the 72-inch transmission main (pipeline) available for service. An Act 399 permit does not apply here; however, he plans to offer the DEQ's concurrence with their proposed procedure – provided that it references adherence to AWWA's disinfection standard and the sampling protocol that was discussed. Mike spoke with the city and the county today to confirm that actions are underway.

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Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ)
Subject: Daily updates
Importance: High

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The Governor wants daily updates regarding the progress we are making on the Flint issue. Can you please provide me with a summary of the action steps that we have taken on a daily basis? The summary should not contain excessive detail, it should be something like:

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The above examples are for illustrative purposes only

I need to have this summary each day no later than 4:30 PM. This is a hard deadline as we need to get the summary to the Governor by 5:00 PM. Please make sure that you copy Mary Beth and Karen.

Thank you!
 George

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Wednesday, October 14, 2015 7:57 AM
To: Shekter Smith, Liane (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ)
Cc: Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ); Philip, Kris (DEQ); DeBruyn, Dana (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Pallone, Maggie (DEQ)
Subject: RE: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - daily update 10/13.

I have added some to the original list to bring things up to date for today's report to the Governor.

I think the full blown verbiage below can be used as a separate attachment and then the chart can be filled in with a very short description. I have included suggested descriptions for the chart in parentheses.

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

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, October 13, 2015 5:12 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ); Philip, Kris (DEQ); DeBruyn, Dana (DEQ)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - daily update 10/13.

Action Step 1. Preliminary list completed, circulated to HHS, and has been provided to DLARA to begin plumbing assessments. The list will remain active in case of additional schools requesting assessment/testing. (COMPLETE)

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

Action Step 3. Preliminary comments received by voice mail from EPA. Need to discuss directly. (Incorporating comments from partners)

Action Step 4. DEQ comments provided to MDARD and draft forwarded to DHHS for their comments. (Comments provided to MDARD)

Action Step 6. Approve Flint Plan for waterline (Disinfection Complete, waiting for test results and completion of system flushing)

The city and the county flushed the pipeline beginning yesterday, the first set of samples for total coliform analysis were collected around 2:30am. Genesee County will be collecting their second sample for bacteriological analysis between 6 and 8pm.

I suspect that it will take additional time to flush the Dort Reservoir before it is ready to be sampled and may set back the time that the pipeline is ready to be placed into operation (Thurs the soonest possible). The yard piping configuration at the WTP does allow for flexibility in operation and ability to take Dort out of service and maintain supply from Detroit; however, I have not been able to confirm that this is the way the city plans to proceed.

Action Step 7. E-mail sent to DHHS to determine if DEQ or DHHS will be lead and to determine how this effort will be coordinated with broader Pb education/outreach efforts.

Action Step 8. The City of Flint has been contacted and the initial meeting is tentatively scheduled for Friday October 16, 2015. (Meeting tentatively scheduled for 10/16/15)

Action Step 9. The City of Flint has been contacted and the tour of the WTP is tentatively scheduled to occur in conjunction with the initial meeting. Logistics may require postponement until the following week. (Meeting tentatively scheduled for 10/16/15).

Action Step 12. DHHS has been contacted and they have indicated as of 9:30 AM October 13, 2015 that there has been no formal request for an emergency declaration. (Complete, DHHS to notify DEQ if status changes)

Action Step 19. Expedite 399 plan and P04 plan

I contacted Samir Matta from LAN (Flint's consultant) for an update on the corrosion control plan and submittal of the Act 399 permit application. Flint operators, with the assistance of LAN, conducted bench tests using a corrosion inhibitor (orthophosphate) and are making comparisons for use with (treated water from Detroit vs. water treated from the Flint River). LAN is currently preparing plans and a design for installation of an orthophosphate feed system. LAN expects to submit the Act 399 permit application to the DEQ by no later than the end of this week. (Corrosion Control Optimization studies in process)

Action Step 18. Contact KWA to find out if there are any bottlenecks that need to be removed to expedite completion of the KWA pipeline.

(Further discussions with Lapeer County may need to take place)

I contacted John O'Brien (Genesee County Drain Commissioner's Office). The most significant bottleneck involves road restrictions currently being imposed by the Lapeer County Road Commission and include:

- All Lapeer County secondary north-south roads are tagged "no construction traffic" for this project except for primary roads (M-19, M-53, and M-24). This significantly increases distances that construction vehicles must travel (upwards of 15 to 20 miles) to accomplish a short jog either north or south.
- Weight restrictions in the spring will cause construction to slow or stop for one to two months. The county has indicated that St. Clair and Sanilac are not imposing the weight restrictions; however, Lapeer County will maintain their restrictions.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 15, 2015 10:02 AM
To: Dykema, Linda D. (DHHS); Groetsch, Kory J. (DHHS)
Cc: Krisztian, George (DEQ); DeBruyn, Dana (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Besey, Kevin (MDARD)
Subject: RE: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - Draft recommendations for restaurants from MDARD

Thanks Linda –

So everyone is on the same page - Businesses that wish to be tested can go through the lab and must pay for the testing. They are not being offered free testing as is being done for residents.

Since the document MDARD prepared is specific to restaurants, etc. not sure that we have enough basis to suggest that mid-day flushing is necessary. But flushing is never a bad idea. We'll keep this in mind as we proceed with developing recommendations for schools.

I believe as long as the Genesee County do not use the water order is still in place, we should be confident that bagged ice isn't produced locally. **Kevin** – you may want to place a caveat in the document just in case.

From: Dykema, Linda D. (DHHS)
Sent: Wednesday, October 14, 2015 10:19 AM
To: Shekter Smith, Liane (DEQ); Groetsch, Kory J. (DHHS)
Cc: Krisztian, George (DEQ); DeBruyn, Dana (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Besey, Kevin (MDARD)
Subject: RE: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - Draft recommendations for restaurants from MDARD
Importance: High

We've seen a more finished version. I agree with the recommendations with some caveats:

- Can businesses get the free water testing offered to citizens?
- Some of the literature we've reviewed suggests that lines might need to be flushed if not used for less than 6 hours. School drinking fountains for example might need flushing at mid-day even if flushed in the morning.
- Can we be sure "bagged ice" was not produced locally?
- The sentence "Other equipment that may use city water:" could be read as permissive. Suggest changing may to "might be connected to."

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, October 13, 2015 2:07 PM
To: Dykema, Linda D. (DHHS); Groetsch, Kory J. (DHHS)
Cc: Krisztian, George (DEQ); DeBruyn, Dana (DEQ); Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ); Besey, Kevin (MDARD)
Subject: DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA - Draft recommendations for restaurants from MDARD
Importance: High

Linda and Kory –

The attached document was created by MDARD and modified by DEQ NCWS staff. MDARD plans to e-mail this to food establishments in the flint area and also provide it to the Genesee County LHD for their use. MDARD is anxious to get this out to restaurants but would like your review/comments prior to finalizing.

This is a request for content review. They'll take care of making it look nice.

Comments can go back to MDARD directly (Kevin Besey), but I'd like to be cc'd also so that we can see your comments also. That will help us craft future messages.

Thanks.

Rennaker, Joanne (DEQ)

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The attached document was created by MDARD and modified by DEQ NCWS staff. MDARD plans to e-mail this to food establishments in the flint area and also provide it to the Genesee County LHD for their use. MDARD is anxious to get this out to restaurants but would like your review/comments prior to finalizing.

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Comments can go back to MDARD directly (Kevin Besey), but I'd like to be cc'd also so that we can see your comments also. That will help us craft future messages.

Thanks.

Rennaker, Joanne (DEQ)

From: Madziar, Joseph (LARA)
Sent: Tuesday, October 20, 2015 7:57 AM
To: Shekter Smith, Liane (DEQ); Poy, Thomas; Dykema, Linda D. (DHHS); jhenry@gchd.us
Cc: Krisztian, George (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Subject: RE: DRAFT DELIBERATIVE. Working Draft - School Sampling Protocol

Liane,

The plumbing profile looks good. We will be using it as our guideline when we start our inspections on Wednesday.

Joe

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 19, 2015 4:55 PM
To: Poy, Thomas; Dykema, Linda D. (DHHS); Madziar, Joseph (LARA); jhenry@gchd.us
Cc: Krisztian, George (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ)
Subject: DRAFT DELIBERATIVE. Working Draft - School Sampling Protocol

Please see attached.

Your comments by COB Tuesday (tomorrow) would be appreciated. Sooner would be better!

Liane

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Wednesday, November 04, 2015 8:49 PM
To: Feuerstein, Heather (DEQ)
Cc: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Sygo, Jim (DEQ)
Subject: Re: Freeman Elementary Sample-Assessment-Recommendations-Draft 11-4-15.docx

It looks good to me. A couple of the pictures did not look right but I was reading this on my phone

Sent from my iPhone

On Nov 4, 2015, at 5:22 PM, Feuerstein, Heather (DEQ) <FeuersteinH@michigan.gov> wrote:

This includes Karen T's edits. Steve I put in red text where we need you to fill in the blank.

<Freeman Elementary Sample-Assessment-Recommendations-Draft 11-4-15.docx>

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Thursday, October 01, 2015 6:49 PM
To: Pallone, Maggie (DEQ); Busch, Stephen (DEQ)
Subject: RE: Kildee Letter DRAFT

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

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

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

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

Thanks,
Maggie

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

Nick & Dan:

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

--Eric

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

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Wednesday, October 14, 2015 12:27 PM
To: Busch, Stephen (DEQ)
Cc: Krisztian, George (DEQ); Dykema, Linda D. (DHHS)
Subject: Re: Preliminary and deliberate information not subject to FOIA
Attachments: City of Flint Schools List (1).xlsx

Steve,

We have filtered your universe list and taken out duplicates and township locations that do not have Flint water. We verified that there are open and active water accounts and have found and called active phone numbers and in most cases a contact name.

I will work on additional filters for priority.

On Mon, Oct 12, 2015 at 8:31 AM, Howard Croft <hcroft@cityofflint.com> wrote:
 Steve,

Let me know if you can link to the following address where we have mapped all of the schools. If you mouse over and click on each schoolhouse, additional data will pop up and we can populate that with contact information.

<http://arcg.is/1L4gZZk>

On Mon, Oct 12, 2015 at 8:00 AM, Howard Croft <hcroft@cityofflint.com> wrote:
 Steve,

We have been going through the list and expect to have everything plotted and prioritized by Tuesday. I am verifying through the Treasurers office which schools are open with active water accounts.

On Fri, Oct 9, 2015 at 3:25 PM, Howard Croft <hcroft@cityofflint.com> wrote:
 Steve,

Here is a list of Non-Public schools in Genesee County. There are only a few that are in Flint but all of the contact data is there. I have started working on a priority list and will have an update for you on Monday.

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

--

Howard Croft

Public Works Director

City of Flint

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Flint, MI 48502

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--

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--

Howard Croft

Public Works Director

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1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

StatusName	EntityTypeName	OriginalEn	EntityOfficialName	ActualGradeList	ActualEducationalSettings	PhysicalAddress1	PhysicalAddress2	PhysicalC	Physi	PhysicalZip	Contact Name	Contact Tel#
Open-Active	PSA School	08732	International Academy of Flint (K-12)	KG,1-12	GenEd,SpecEd	2820 SOUTH SAGINAW ST		FLINT	MI	485035708	Kendra Giles, Director	810-600-5223
Open-Active	LEA School	07576	Mott Middle College High School	9-12	Alt, GenEd	1401 EAST COURT ST		FLINT	MI	485036208	Margaret E. Green, Principal	810-232-8531
Open-Active	LEA School	02777	Northwestern High School	9-12	21CCL, Alt, GenEd, SpecEd	G2138 WEST CARPENTER RD		FLINT	MI	485051977	Timothy Green, Principal	810-767-8400
Open-Active	LEA School	03554	Southwestern Classical Academy	7-12	Alt, GenEd	1420 WEST 12TH ST		FLINT	MI	485071425	Cheryl Tate, Principal	810-760-1400
Open-Active	LEA School	03033	Pierce School	KG, KG-Part, 1-6	21CCL, GenEd, PK, SpecEd	1101 WEST VERNON DR		FLINT	MI	485032840	Shalonda Byas, Principal	810-767-8290
Open-Active	LEA School	09129	Doyle/Ryder School	KG-Part, 1-6	GenEd, PK, SpecEd	1040 NORTH SAGINAW ST		FLINT	MI	485031736	Rob Bueche, Principal	810-760-5266
Open-Active	LEA School	03108	Potter School	KG,KG-Part,1-7	21CCL, GenEd, PK, SpecEd	2500 NORTH AVERILL AVE		FLINT	MI	485063010	Gretchen Shafer, Principal	810-760-1813
Open-Active	LEA School	02670	Neithercut Elementary School	KG-Part, 1-6	21CCL, GenEd, PK, SpecEd	2010 CRESTBROOK LN		FLINT	MI	48507	Debra Jackson-Noble, Principal	810-760-1359
Open-Active	LEA School	01320	Freeman School	KG, KG-Part, 1-6	21CCL, GenEd, PK, SpecEd	4001 OGEMA AVE		FLINT	MI	485072887	Anita Steward, Principal	810-760-1797
Open-Active	LEA School	01098	Eisenhower School	KG, KG-Part, 1-6	21CCL, Alt, GenEd, PK, SpecEd	1235 PERSHING ST		FLINT	MI	485033533	Rachel Turner, Principal	810-760-1607
Open-Active	LEA School	00974	Durant Tuuri Mott School	KG-Part,1-7	21CCL, GenEd, PK, SpecEd	1518 UNIVERSITY AVE		FLINT	MI	485046208	Shelly Umphrey, Principal	810-760-1594
Open-Active	Nonpublic School	03956	St. Paul Lutheran School	KG-Part, 1-8	GenEd, PK	402 SOUTH BALLENGER HWY		FLINT	MI	485323637	Mary Lynn Buck, Principal	810-239-6733
Open-Active	Nonpublic School	06022	Fr. Luke M. Powers High School	9-12	GenEd	1505 W Court St		Flint	MI	485035002	Thomas Furnas, Principal	810-591-4741
Open-Active	Nonpublic School	06217	St. John Vianney School	KG-Part, 1-8	GenEd, PK	2319 BAGLEY ST		FLINT	MI	485044613	Lara Daniel, Principal	810-235-5687
Open-Active	State School	02548	Michigan School for the Deaf	KG, 1-12	PK, SpecEd	1235 W. COURT ST.		FLINT	MI	485035015	Cecelia Winkler, Principal	810-257-1400
Open-Active	PSA School	09305	Richfield Public School Academy	3-8	GenEd, PK, SpecEd	3807 NORTH CENTER RD		FLINT	MI	485062642	Aubrey McClain, Principal (3-5) Amy Boyles, Principal (6-8)	810-736-1281
Open-Active	LEA School	09774	Genesee Early College	9-12	Alt, GenEd, SchiChoice	2413 W Maple Ave	(U of M Flint Campus - 509 Harrison St., #3102 Flint, MI 48502	Flint	MI	48507	Ms. Margaret Green Interim Principal	810-591-5115
Open-Active	Other Non-School Recipient	25000006	FOOD BANK OF EASTERN MICHIGAN INC			2312 LAPEER RD		FLINT	MI	485034221		810-239-4441
Open-Active	Other Non-School Recipient	25SPX001	GLORIAS LITTLE ANGELS INC			ATTN VENITA HILER		FLINT	MI	48507	VENITA HILER	810-424-9649
Open-Active	Other Non-School Recipient	25000006	MIRIAM D CLEMONS/SAND CASTLES			3129 CLIO RD		FLINT	MI	485047184	MIRIAM D CLEMONS	810-233-3644
Open-Active	Other Non-School Recipient	25000001	Genesee County Community Action Resource Department			719 HARRISON ST		FLINT	MI	485021613	Steve Walker	810-232-2185
Open-Active	Other Non-School Recipient	25SPX000	SHELTER OF FLINT INC			924 Cedar Street		Flint	MI	485033620	Anne Grantner	810-239-5433
Open-Active	Other Non-School Recipient	255C0450	TALL PINE COUNCIL			BOY SCOUTS OF AMERICA	507 W ATHERTON ROAD	FLINT	MI	48507	Misty or Laura	989-662-4464
Open-Active	Other Non-School Recipient	81000003	U OF M EARLY CHILDHOOD DEV. CENTER			303 E. Kearsley St.,	1313 William S. White Buidl	FLINT	MI	485021715	Della Becker -Cornell, Director	810-424-5214
Open-Active	Other Non-School Recipient	25SPX002	Eagle's Nest Child Care Center			6103 Eagle Ridge Ln		Flint	MI	485056740		810-787-3900
Open-Active	Other Non-School Recipient	99000007	Connexion, Incorporated			1110 ELDON BAKER DR		FLINT	MI	485071923	Herbert Winfrey, Program Manager	810-715-2340
Open-Active	Other Non-School Recipient	25000800	Whaley Children's Center			1201 NORTH GRAND TRAVERSE ST		FLINT	MI	485031312	Becki Flanagan, Director of Finance	810-234-3603
Open-Active	Other Non-School Recipient	25SPX002	BRIDONS CHILD DEVELOPMENT CENTER			817 EAST KEARSLEY ST	SUITE 3C	FLINT	MI	485032076		810-249-5437
Open-Active	Other Non-School Recipient	25000511	Flint Institute of Music			1025 EAST KEARSLEY ST		FLINT	MI	485031922	Paul Torre, President & CEO	810-238-1350
Open-Active	Other Non-School Recipient	99000020	SUNNY PATCH LEARNING CENTER, LLC			1160 DONALDSON BLVD		FLINT	MI	485043217		810-235-2444
Open-Active	Other Non-School Recipient	99000025	Alutiq Professional Services, LLC			2400 N. Saginaw St.		Flint	MI	48505	Daniel Sheppard, Center Director	810-232-9102
Open-Active	Other Non-School Recipient	99000065	Living Word Ministry Enrichment			2001 W Carpenter Rd		Flint	MI	50479	Kirk Laron Whitmore, Pastor	810-787-2183
Open-Active	Other Non-School Recipient	99000066	Honey Bee Palace Child Care Center, Inc.			642 E Pierson Rd		Flint	MI	51900		810-820-8020

Open-Active	Other Non-School Recipient	99000091: Motherly Intercession			817 E Kearsley St	Flint	MI	485032076	Shirley Cochran, Executive Director	810-424-9909
Open-Active	Other Non-School Recipient	99000100: HJ&G LLC, Bright Beginnings			G3393 Clio Rd	Flint	MI	485041894		810-789-8848
Open-Active	Other Non-School Recipient	99000110: Positive Start Child and Development Center			3500 W Pasadena Ave	Flint	MI	485042353	Dr. F. E. Gilliard, Pastor	810-230-0085
Open-Active	Other Non-School Recipient	99000121: Mott Community College			1401 E Court St	Flint	MI	485032089	Kerry Farah , Administrative Assistant - Facilities Ken Gatenby, Maintenance Supervisor	810-762-5684 810-762-0260
Open-Active	PSA School	01402 The New Standard Academy	KG,1-8	GenEd, PK, SpecEd	2040 W. Carpenter	Flint	MI	48505	Greg Lathrop	810-787-3330
Open-Active	Other Non-School Recipient	Alpha Kids	14 months - KG	*In YWCA Greater Flint Building*	310 E 3rd St	Flint	MI	485021711	Dolores Glynn, Director	810-239-4689
Open-Active	LEA School	01916 Brownell STEM Academy	KG,1-2	GenEd,PK	6302 Oxley Dr	Flint	MI	485041698	Anna Johnson, Principal	810-760-1643
Open-Active	LEA School	01917 Holmes STEM Academy	3-7	GenEd,PK	6602 Oxley Dr	Flint	MI	485041674	Anna Johnson, Principal	810-760-1643
Open-Active	PSA School	01882 WAY Academy - Flint, Flint Campus	7-12	Alt	817 E Kearsley St	Flint	MI	485032076	Madeline Black, Director Rita Cheek, Principal	810-412-8655
Open-Active	PSA School	02031 Genesee STEM Academy	KG,1-7	GenEd, PK, SpecEd	310 W Oakley St	Flint	MI	485033915	Debra Rosebush, Director of State & Federal Compliance	810-600-6466
Open-Active	Other Non-School Recipient	99000459: Genesee Area Focus Fund, Inc.			519 S Saginaw St	Flint	MI	485021815		810-600-1404
Open-Active	LEA Unique Education Provider	02564 Genesee County Jail	9-12	AdultEd, Alt, Locked	1002 S. Saginaw	Flint	MI	485021499	Sheriff Robert J. Pickell	810-257-3407
Open-Active	Other Non-School Recipient	99000490: KIDDIE TIME CHILDCARE CENTER			915 S Dort Hwy	Flint	MI	485032800		810-780-4890

BERRY CHILD CARE CENTER			617 HEMPHILL RD	FLINT	MI	48507
BRIDONS CHILD DEVELOPMENT CENTER I			817 EAST KEARSLEY ST, STE 3C	FLINT	MI	485032076
CASTILLO ENTERPRISE LLC			G3393 CLIO RD	FLINT	MI	48504
Children First Child Care Center Corp.			1081 HOURAN ST	FLINT	MI	485323630
Eagle's Nest Child Care Center			6103 Eagle Ridge Ln	Flint	MI	485056740
Early On		PK,SpecEd,SpecEdCtPr	5089 Pilgrim Rd	Flint	MI	485073909
Early On / Special Education		PK,SpecEd,SpecEdCtPr	5089 Pilgrim Rd	Flint	MI	485073909
FOOD BANK OF EASTERN MICHIGAN INC			2312 LAPEER RD	FLINT	MI	485034221
GENESEE CHRISTIAN DAY CARE			G-3237 BEECHER ROAD	FLINT	MI	48532
Genesee ISD Head Start			5075 Pilgrim Rd	Flint	MI	485073909
GLORIAS LITTLE ANGELS INC			2440 LIPPINCOTT BLVD	FLINT	MI	48507
GREAT LAKES FIELD SERVICES-DAUCH SCOUT CENTER			507 W Atherton Rd	Flint	MI	485072404
HJ&G LLC, Bright Beginnings			G3393 Clio Rd	Flint	MI	485041894
Honey Bee Palace Child Care Center, Inc.			642 E Pierson Rd	Flint	MI	51900
Jireh Outreach Ministries Int			925 AVON ST	FLINT	MI	485032701
KIDDIE KAT CHILDRENS CENTER LLC			5003 EAST CARPENTER RD	FLINT	MI	485064521
KIDDIE TIME CHILDCARE CENTER			915 S Dort Hwy	Flint	MI	485032800
LAZY LEOPARD-FLINT DAY CARE CENTER			930 EAST MYRTLE AVE	FLINT	MI	485055519
MARY MCGEE			G-5248 N SAGINAW	FLINT	MI	48505
MIRIAM D CLEMONS/SAND CASTLES			3129 CLIO RD	FLINT	MI	485047184
Positive Start Child and Development Center			3500 W Pasadena Ave	Flint	MI	485042353
Richfield Public School Academy Pre-K	DevK	GenEd, PK, SpecEd	6103 Eagle Ridge Lane	Flint	MI	48505
SOUTH FLINT TABERNACLE INC			PO BOX 7008	FLINT	MI	485070008
SUNNY PATCH LEARNING CENTER, LLC			1160 DONALDSON BLVD	FLINT	MI	485043217
T-Care's Daycare			5711 Fleming Rd	Flint	MI	485045002
The Learning Community		PK,SpecEd	1181 WEST SCOTTWOOD AVE	FLINT	MI	485073615
Thelma Buffey Early Childhood Center		PK	4235 Crosby Rd	FLINT	MI	485061530
U OF M EARLY CHILDHOOD DEV. CENTER			509 Harrison St	Flint	MI	485021715
uniquely created children's center Llc			2040 w carpenter rd	flint	MI	485051908
village childcare Academy			G4544 BEECHER RD	FLINT	MI	48532
Wayne L. Rankins Preschool			6436 Bray Rd	Flint	MI	485051813
WEE LITTLE QUACKERS CHILD CARE CTR			4406 Lennon Rd	Flint	MI	485071029
Whaley Children's Center			1201 NORTH GRAND TRAVERSE ST	FLINT	MI	485031312

Brownell STEM Academy	KG,1-2	GenEd,PK
Colonel Donald McMonagle Elementary School	KG,1-6	Alt, GenEd, PK, SpecEd
Doyle/Ryder School	KG-Part, 1-6	GenEd, PK, SpecEd
Durant Tuuri Mott School	KG-Part,1-7	21CCL, GenEd, PK, SpecEd
Dye Elementary School	KG, KG-Part, 1-5	GenEd,SpecEd
Eagle's Nest Academy	KG,1-4	GenEd, SpecEd
Eisenhower School	KG, KG-Part, 1-6	21CCL, Alt, GenEd, PK, Sp
Elmer A. Knopf Learning Center	DevK, DevK-Part, KG, K	SpecEd,SpecEdCtPr
Fairhaven SDA School	1-2,4-8	GenEd
First Flint SDA School	1-2,4-6,8	GenEd
Freeman School	KG, KG-Part, 1-6	21CCL, GenEd, PK, SpecEd
Genesee STEM Academy	KG,1-7	GenEd, PK, SpecEd
Greater Heights Academy	KG,1-6	GenEd, SpecEd
Holmes STEM Academy	3-7	GenEd,PK
Holy Rosary School	KG-Part, 1-8	GenEd
International Academy of Flint (K-12)	KG,1-12	GenEd,SpecEd
Kate Dowdall Elementary School	KG,1-3	GenEd,Alt
Leota Fiedler Elementary School	1, 4-5	GenEd,Alt
Linden Charter Academy	KG, 1-8	GenEd,SpecEd
Madison Academy Elementary/Middle School	KG-Part,1-8	Alt, GenEd, SpecEd
Michigan School for the Deaf	KG, 1-12	PK, SpecEd
Milton E. Tucker Middle School	5-8	GenEd
Neithercut Elementary School	KG-Part, 1-6	21CCL, GenEd, PK, SpecEd
Northridge Academy	KG, 1-8	Alt, GenEd, PK, SpecEd
Northwestern Early Childhood Education Center	KG	GenEd, PK
Pierce School	KG, KG-Part, 1-6	21CCL, GenEd, PK, SpecEd
Potter School	KG,KG-Part,1-7	21CCL, GenEd, PK, SpecEd
Randels Elementary School	KG, KG-Part, 1-5	GenEd,SpecEd
Richfield Public School Academy	3-8	GenEd, PK, SpecEd
Richfield Public School Academy K-2	KG,1-2	BSAS, GenEd, PK, SchlChc
Special Education Services-South	DevK, DevK-Part, KG, K	PK,SpecEd,SpecEdCtPr
Special Services - North	KG,KG-Part,1-12	SpecEd,SpecEdCtPr
St. John Vianney School	KG-Part, 1-8	GenEd, PK
St. Paul Lutheran School	KG-Part, 1-8	GenEd, PK
St. Pius X School	KG-Part, 1-8	GenEd, PK
Stalker Elementary		PK
The New Standard Academy	KG,1-8	GenEd, PK, SpecEd

6302 Oxley Dr	Flint	MI	485041698
3484 NORTH JENNINGS RD	FLINT	MI	485041757
1040 NORTH SAGINAW ST	FLINT	MI	485031736
1518 UNIVERSITY AVE	FLINT	MI	485046208
1174 SOUTH GRAHAM RD	FLINT	MI	485323533
5005 Cloverlawn Dr	Flint	MI	485042084
1235 PERSHING ST	FLINT	MI	485033533
1493 WEST MAPLE AVE	FLINT	MI	485075613
G-1379 WEST LOUIS AVE	FLINT	MI	48505
G4285 BEECHER RD	FLINT	MI	485322711
4001 OGEMA AVE	FLINT	MI	485072887
310 W Oakley St	Flint	MI	485033915
3196 W Pasadena Ave	Flint	MI	485042330
6602 Oxley Dr	Flint	MI	485041674
5191 RICHFIELD RD	FLINT	MI	485062114
2820 SOUTH SAGINAW ST	FLINT	MI	485035708
3333 SHILLELAGH DR	FLINT	MI	485062246
6317 NIGHTINGALE DR	FLINT	MI	485061714
3244 NORTH LINDEN RD	FLINT	MI	485041753
6170 Torrey Rd	Flint	MI	485075954
1235 W. COURT ST.	FLINT	MI	485035015
G5159 Summit Street	Flint	MI	485051429
2010 CRESTBROOK LN	FLINT	MI	48507
530 W Pierson Rd	Flint	MI	485053114
G2138 W Carpenter Rd	Flint	MI	485051977
1101 WEST VERNON DR	FLINT	MI	485032840
2500 NORTH AVERILL AVE	FLINT	MI	485063010
6022 BROBECK ST	FLINT	MI	485324006
3807 NORTH CENTER RD	FLINT	MI	485062642
4358 Richfield Rd	Flint	MI	485062016
5089 PILGRIM RD	FLINT	MI	485073909
2413 W Maple Ave	Flint	MI	485073429
2319 BAGLEY ST	FLINT	MI	485044613
402 SOUTH BALLENGER HWY	FLINT	MI	485323637
G3139 HOGARTH AVE	FLINT	MI	485325132
3329 BURNELL AVE	FLINT	MI	485044303
2040 W. Carpenter	Flint	MI	48505

Academy West Alternative Education	6-12	AdultEd, Alt
Accelerated Learning Academy	7-12	AdultEd, Alt
Armstrong Middle School	6-8	Alt, GenEd
Bendle/Carman-Ainsworth Alternative Education	6-12	AdultEd, Alt
Carman Park-Baker Career Academy	9-12	GenEd
Carman-Ainsworth High School	8-12	Alt, GenEd, SpecEd
Carman-Ainsworth Middle School	6-8	Alt, GenEd, SpecEd
Flint Boy's and Girl's Preparatory Academy		
Fr. Luke M. Powers High School	9-12	GenEd
Genesee Career Institute	11-12	GenEd
Genesee Early College	9-12	Alt, GenEd, SchlChoi
Hamady Community High School	9-12	Alt, GenEd, SpecEd
Hamady Middle School	7-8	Alt, GenEd, SpecEd
Kearsley High School	9-12	GenEd,Alt
Mott Middle College High School	9-12	Alt, GenEd
Northwestern High School	9-12	21CCL, Alt, GenEd, S
Southwestern Classical Academy	7-12	Alt, GenEd
WAY Academy - Flint, Flint Campus	7-12	Alt

3400 N Jennings Rd	Flint	MI	485041757
G2138 W. Carpenter Road	Flint	MI	485051977
6161 HOPKINS RD # G	FLINT	MI	485061657
3493 Beveridge Rd # G	Flint	MI	48532
3375 Van Campen Rd	Flint	MI	48507
1300 NORTH LINDEN RD	FLINT	MI	485322341
1409 WEST MAPLE AVE	FLINT	MI	485075613
1185 E Foss Ave	Flint	MI	485052324
1505 W Court St	Flint	MI	485035002
5081 Torrey Rd	Flint	MI	485075999
2413 W Maple Ave	Flint	MI	48507
3223 WEST CARPENTER RD # G	FLINT	MI	485041247
3223 WEST CARPENTER RD # G	FLINT	MI	485041247
4302 UNDERHILL DR # G	FLINT	MI	485061534
1401 EAST COURT ST	FLINT	MI	485036208
G2138 WEST CARPENTER RD	FLINT	MI	485051977
1420 WEST 12TH ST	FLINT	MI	485071425
817 E Kearsley St	Flint	MI	485032076

Mott Community College

1401 E Court St

Gateway to College-Mott Community College 9-12

Alt,AdultEd

1401 E Court St

Flint	MI	485032089
Flint	MI	485032089

Beecher Adult Education Center		AdultEd
Carman-Ainsworth Service Center		
Carman-Ainsworth Transportation Building		
Coates Administration Center		
Flint Institute of Music		
Genesee County Community Action Resource Department		
Genesee County Jail	9-12	AdultEd, Alt, Locked
Genesee ISD Transition Center		SpecEd,SpecEdCtPr
Genesee Valley Regional Center		
Genesee Valley Regional Center	5-12	Alt,JuvDtn
Health, Safety and Nutrition Services		BSAS, FamResCtr, PK
Michigan Crossroads Council, Inc., Boy Scouts of America		
Michigan Organization on Adolescent Sexual Health		
Michigan School for the Deaf and Blind		
SHELTER OF FLINT INC		
TALL PINE COUNCIL		

1020 W. Coldwater Ro Flint	MI	485054831
G3475 WEST COURT S FLINT	MI	485324742
1409 WEST MAPLE AV FLINT	MI	485075613
G5285 SUMMIT ST FLINT	MI	485051328
1025 EAST KEARSLEY S FLINT	MI	485031922
719 HARRISON ST FLINT	MI	485021613
1002 S. Saginaw Flint	MI	485021499
3136 SOUTH LINDEN R FLINT	MI	485073004
4287 WEST PASADENA FLINT	MI	485042342
4287 W. Pasadena Ave Flint	MI	485042342
5075 Pilgrim Rd Flint	MI	485073909
507 W Atherton Rd Flint	MI	48507
2015 Gold Ave Flint	MI	485032133
1235 W Court St Flint	MI	485035015
924 Cedar Street Flint	MI	485033620
BOY SCOUTS 507 W ATH FLINT	MI	48507

Alpha Montessori School	310 E 3rd St	Flint
Alutiiq Professional Services, LLC	2400 N. Saginaw St.	Flint
Connexion, Incorporated	1110 ELDON BAKER DR	FLINT
Eagles Nest Academy	5005 Cloverlawn Dr	Flint
Genesee Area Focus Fund, Inc.	519 S Saginaw St	Flint
Lifetime Learning Incorporated	1726 Laurel Oak	Flint
Living Word Ministry Enrichment	2001 W Carpenter Rd	Flint
Michigan School for the Deaf and Blind	1235 W Court St	Flint
Motherly Intercession	817 E Kearsley St	Flint

MI	485021711
MI	48505
MI	485071923
MI	485042084
MI	485021815
MI	485072211
MI	50479
MI	485035015
MI	485032076

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Monday, October 12, 2015 8:00 AM
To: Busch, Stephen (DEQ)
Cc: Krisztian, George (DEQ); Dykema, Linda D. (DHHS)
Subject: Re: Preliminary and deliberate information not subject to FOIA

Steve,

We have been going through the list and expect to have everything plotted and prioritized by Tuesday. I am verifying through the Treasurers office which schools are open with active water accounts.

On Fri, Oct 9, 2015 at 3:25 PM, Howard Croft <hcroft@cityofflint.com> wrote:
Steve,

Here is a list of Non-Public schools in Genesee County. There are only a few that are in Flint but all of the contact data is there. I have started working on a priority list and will have an update for you on Monday.

--

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: Krisztian, George (DEQ)
Sent: Saturday, October 17, 2015 2:50 PM
To: Shaler, Karen (DEQ)
Cc: Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ); Shekter Smith, Liane (DEQ); Tommasulo, Karen (DEQ)
Subject: RE: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Karen,

Please see the e-mail below with edits by for inclusion in Monday's Governor's report. .

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

From: Shekter Smith, Liane (DEQ)
Sent: Friday, October 16, 2015 5:43 PM
To: Krisztian, George (DEQ)
Cc: Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Sygo, Jim (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Please see Mike's updates below.

Liane J. Shekter Smith, P.E., Chief
 Office of Drinking Water and Municipal Assistance
 Michigan Department of Environmental Quality
 517-284-6543

From: Prysby, Mike (DEQ)
Sent: Friday, October 16, 2015 4:06 PM
To: Shekter Smith, Liane (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: Preliminary and Deliberative: Not Subject to FOIA: Action Steps - Update

Liane,

Below is an update of the Action Steps assigned to me.

Action Step 6 – Flint pipeline is ready has been placed into service. Water From the

Great Lakes Water Authority began flowing Friday afternoon October 16, 2015. (Karen, Please confirm that this is factual)

Action Step 18 - Contact KWA to identify any construction bottlenecks

No updates today – this Action Step will be carried over next week to continue working With KWA towards addressing the bottlenecks.

Action Step 19 – Expedite 399 Plan and Phosphate Plan

Corrosion control proposal received electronically from LAN this morning (without 399 application). Pat and I are reviewing the proposal and preparing comments. The proposal was forwarded to Darren Lytle and Michael Schock from EPA for their review with comments requested by Monday morning. Darren acknowledged receipt of the proposal. LAN is hand delivering a full sized set of the proposal along with a signed permit application later this afternoon.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

Action Step 20

The City of Flint provide information during the initial coordination meeting that approximately 25% of the index card conversion has taken place. The card have been given to the University of Michigan Flint for entry into GIS. The City has indicated that this is a slow process and they are looking at ways to speed up the process. This is a manually intensive process and they lack the resources to accomplish the task faster.

Action Step 21

The City of Flint will provide a link to the GIS mapping and Howard Croft gave a short presentation on how the use the GIS mapping program.

Additional Actions

George Krisztian and Keren Tommasulo represented the DEQ in the initial weekly coordination meeting with the City of Flint. Present were representatives from DEQ, LARA, DHHS and the City of Flint. Each partner provided a brief synopsis of what their respective group had done the past week and there was discussion on action steps for the following week. Additional discussion included presenting a unified message, creation of a homeowners sampling instructions work group, and inclusion of the Genesee County Health Department for the weekly coordination meetings.

George Krisztian, Karen Tommasulo and Liane Shekter Smith represented the DEQ in a meeting with the Flint Superintendent, Bilal Tawwab. Also present were representatives from LARA, DHHS, Principals from the first three schools that are going through the plumbing

evaluation protocol as well as additional staff from the School District. The DEQ provided an overview of the protocol which includes a plumbing evaluation, subsequent sampling of all faucets and drinking fountains that are used for consumptive purposes, analysis of the samples, consolidation of the data and then review of the data from a health based exposure perspective. There was also discussion that the GCHD would be asked to conduct the sampling so that we ensure all aspects the data is of the highest possible quality. There was also discussion of the need to ensure that the superintendent's office receive the data along with comments on the data before the data is made public. It was agreed that all partners (DEQ, LARA, DHHS, the Superintendent, City of Flint and GCHD) would all be provided the data along with context before the data was released to the public. It was also agreed that there needed to be coordination with respect to who would be releasing the data to the public.

George Krisztian, Karen Tommasulo and Liane Shekter Smith met with James Henry at the Genesee County Health Department. The purpose of the meeting was to:

- Invite GCHD to attend the weekly Coordination Meeting with the City of Flint
- Ask if GCHD would be willing to take the samples for the school plumbing evaluations
- Invite Mr. Henry to be part of the Home owner water sampling instructions work group.

The GCHD provided positive response on all three subjects but did indicate that they would need funding to assist with the sampling. GCHD was asked to submit a request to the DEQ so that question of funding could be addressed formally.

Rennaker, Joanne (DEQ)

From: Madziar, Joseph (LARA)
Sent: Wednesday, October 28, 2015 10:32 AM
To: Busch, Stephen (DEQ)
Cc: Edgerton, Shelly (LARA); Krisztian, George (DEQ)
Subject: RE: Preliminary and deliberative - Draft assessment review

Steve ,

I have reviewed your attached analysis of the results of the water samples from Freeman Elementary. You have addressed everything we spoke of in our meeting on Tuesday.

Joe

From: Busch, Stephen (DEQ)
Sent: Wednesday, October 28, 2015 9:23 AM
To: Madziar, Joseph (LARA)
Cc: Edgerton, Shelly (LARA); Krisztian, George (DEQ)
Subject: Preliminary and deliberative - Draft assessment review

Joe,

I drafted the attached last night based on our meeting and discussion yesterday. Please review and comment. Let me know if there is other pertinent information we should include.

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

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:54 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

Sorry, I forgot to answer the first question. You are correct, none of the Schools are on known lead service lines.

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

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:52 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

Linda I believe the notation is the diameter of the service line and the material of construction. Cu would be copper.

Steve can you please let us know what the other materials are?

George

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

From: Dykema, Linda D. (DHHS)
Sent: Tuesday, October 13, 2015 10:41 AM
To: Krisztian, George (DEQ); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

I concur with the prioritization.

So, none of the schools are on known lead service lines? What does the notation that follows (e.g., 4"CI) mean?

Linda D. Dykema, Ph.D.

Environmental Public Health Director
 Division of Environmental Health
 Michigan Department of Health & Human Services
 517.335.8566
dykemal@michigan.gov

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:31 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: FW: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft
Importance: High

Linda, Shelly and Joe,

Please review and provide comment. The prioritization looks appropriate to me but I want to ensure we have consensus. Once I receive comments back we can finalize this as our priority list for the plumbing evaluation and subsequent sampling.

Thank you
 George

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 9:41 AM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

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

Criteria for prioritization included,

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

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

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

Rennaker, Joanne (DEQ)

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:52 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

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Steve can you please let us know what the other materials are?

George

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

From: Dykema, Linda D. (DHHS)
Sent: Tuesday, October 13, 2015 10:41 AM
To: Krisztian, George (DEQ); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

I concur with the prioritization.

So, none of the schools are on known lead service lines? What does the notation that follows (e.g., 4"CI) mean?

Linda D. Dykema, Ph.D.

Environmental Public Health Director
 Division of Environmental Health
 Michigan Department of Health & Human Services
 517.335.8566
dykemal@michigan.gov

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 10:31 AM
To: Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA)
Cc: Madziar, Joseph (LARA); Sygo, Jim (DEQ)
Subject: FW: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft
Importance: High

Linda, Shelly and Joe,

Please review and provide comment. The prioritization looks appropriate to me but I want to ensure we have consensus. Once I receive comments back we can finalize this as our priority list for the plumbing evaluation and subsequent sampling.

Thank you
George

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, October 13, 2015 9:41 AM
To: Krisztian, George (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Preliminary and Deliberative, Not Subject to FOIA - School Analysis Priority List Draft

George,

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

Criteria for prioritization included,

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

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

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

Rennaker, Joanne (DEQ)

From: Thelen, Mary Beth (DEQ)
Sent: Wednesday, October 14, 2015 6:59 PM
To: Krisztian, George (DEQ); Natasha Henderson; Sean Kammer
Cc: Dayne Walling; Howard Croft (hcroft@cityofflint.com); Wyant, Dan (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA); Lyon, Nick (DHHS); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: RE: Preliminary and Deliberative: Not subject to FOIA Weekly meetings

This is to confirm that the first meeting has been scheduled for Friday, October 16, 10:00 a.m. in Natasha Henderson's office.

The following from the state will be in attendance in person or by telephone:

George Krisztian, City of Flint Plan Coordinator and Laboratory Director, Department of Environmental Quality (in person)
 Shelly Edgerton, Deputy Director, Department of Licensing and Regulatory Affairs (in person)
 Dr. Linda Dykema, Department of Health and Human Services (in person OR by telephone)
 Dr. Eden Wells, Chief Medical Executive, Department of Health and Human Services (by telephone)

I have been working with Sean on these arrangements.

Thanks.

Mary Beth

Mary Beth Thelen
 Management Assistant to Director Dan Wyant
 Department of Environmental Quality
 Constitution Hall, 6th Floor South
 Phone: 517-284-6712 or 284-6700 (new numbers)
 Fax: 517-241-7401
Thelenm2@michigan.gov

From: Krisztian, George (DEQ)
Sent: Tuesday, October 13, 2015 4:38 PM
To: Natasha Henderson; Sean Kammer
Cc: Dayne Walling; Howard Croft (hcroft@cityofflint.com); Wyant, Dan (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA); Lyon, Nick (DHHS); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: RE: Preliminary and Deliberative: Not subject to FOIA Weekly meetings

Hi Natasha,

I look forward to working with everyone there. Can you please work with Mary Beth to get the first meeting Scheduled? If possible, I would like the first meeting to take place this week. A lot of things are happening and I want to make sure that we are all coordinated in this effort.

Thank you!
George

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

From: Natasha Henderson [<mailto:nhenderson@cityofflint.com>]

Sent: Tuesday, October 13, 2015 3:14 PM

To: Krisztian, George (DEQ); Sean Kammer

Cc: Dayne Walling; Howard Croft (hcroft@cityofflint.com); Wyant, Dan (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA); Lyon, Nick (DHHS); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)

Subject: Re: Preliminary and Deliberative: Not subject to FOIA Weekly meetings

Hello George,

I will serve as the point of contact for the City to schedule on-going meetings. Also, I have included my Assistant, Sean Kammer in this email.

Thanks,

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

On Mon, Oct 12, 2015 at 11:36 AM, Krisztian, George (DEQ) <krisztiang@michigan.gov> wrote:

Mr. Mayor,

I would like to schedule weekly meetings with you and your key staff so that we can ensure that we have a coordinated effort in resolving the water issue. I would like for the initial meetings to be face to face and I, along with others, will come to Flint for these.

If possible I would like the first meeting to be either Tuesday or Wednesday of this week (10/13 or 10/14) and I would also like to ask for a tour of the Flint Water Treatment Plant.

Mary Beth Thelen will serve as the DEQ's point on coordinating these meetings. Can you please let us know who would be the appropriate contact on your end?

Thank you very much!

George

George L. Krisztian

Flint Action Plan Coordinator

Laboratory Director

Michigan Department of Environmental Quality

Desk ph (517) 284-6719

Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Natasha Henderson <nhenderson@cityofflint.com>
Sent: Tuesday, October 13, 2015 3:14 PM
To: Krisztian, George (DEQ); Sean Kammer
Cc: Dayne Walling; Howard Croft (hcroft@cityofflint.com); Wyant, Dan (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Tommasulo, Karen (DEQ); Dykema, Linda D. (DHHS); Edgerton, Shelly (LARA); Lyon, Nick (DHHS); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
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Natasha L. Henderson, City Administrator
City of Flint, Michigan
 1101 S. Saginaw St.
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Thank you very much!

George

George L. Krisztian

Flint Action Plan Coordinator

Laboratory Director

Michigan Department of Environmental Quality

Desk ph (517) 284-6719

Cell ph (517) 204-0381

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, October 19, 2015 5:15 PM
To: Krisztian, George (DEQ); Cook, Pat (DEQ)
Cc: Busch, Stephen (DEQ); Sygo, Jim (DEQ)
Subject: RE: Preliminary and Deliberative Not Subject to FOIA Update Request on Action Item #16

Action Item #16 (from last week).

On Friday, we calculated an estimate for the number of samples that we expect to take per school. During our meeting with Flint school representatives, they supported our assumptions. Based on this, we estimate that if we collect 3 samples at each drinking water/cooking tap at each school that we can expect to collect approximately 100 samples per school. (13 schools = 1300 samples).

From: Krisztian, George (DEQ)
Sent: Thursday, October 15, 2015 4:12 PM
To: Cook, Pat (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Sygo, Jim (DEQ)
Subject: Preliminary and Deliberative Not Subject to FOIA Update Request on Action Item #16

Hi Pat,

Liane and Steve are busy with some other urgent requests so I am asking you for an update on Action item #16

"Figure out number of samples from schools and child care facilities"

Thank you
 George

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

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Friday, August 28, 2015 1:23 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Cc: Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: RE: Preliminary Flint TTHM results

Yes. The city deserves to be told of our compliance determination just as much when they meet the standard as when they exceed it.

I would suggest the messaging from the city and possibly from us "express cautious optimism but acknowledge that the formation of disinfection byproducts can vary depending upon water quality, temperature and stagnation, all items the city is unable to control, so continued compliance is not assured. As always, the city will keep their customers informed."

From: Busch, Stephen (DEQ)
Sent: Friday, August 28, 2015 11:13 AM
To: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Cc: Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: Preliminary Flint TTHM results

Richard and Liane,

A PRELIMINARY Flint TTHM compliance determination is attached. (The one month monitoring window doesn't officially end until Monday 8/31).

Note all 8 sites would now be in compliance with the LRAA, but we did have one sample this quarter over 80 ppb (site 7, 90.3 ppb). This will make messaging a little more difficult.

Shall we proceed, after August 31, to create a "TTHM return to compliance" letter?

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

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, October 15, 2015 2:43 PM
To: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ)
Subject: RE: repeat sample 2015 PbCu Flint DRAFT DELIBERATIVE. NOT SUBJECT TO FOIA.

Were there any other duplicate addresses included in the sampling pool?

From: Rosenthal, Adam (DEQ)
Sent: Thursday, October 15, 2015 2:15 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: repeat sample 2015 PbCu Flint

3714 Beecher Rd, Melissa Mays co-founder of Water you fighting for.

3/24/15 kitchen, Pb = 2 ppb

5/14/15 main bathroom, Pb = 8 ppb

Preliminary and Deliberative not subject to FOIA

Rennaker, Joanne (DEQ)

From: Mike Wright <jmikewright@yahoo.com>
Sent: Tuesday, March 17, 2015 8:53 PM
To: Prysby, Mike (DEQ); Howard Croft; Brent Wright; Daugherty Johnson; Dayne Walling; donna. cole; gdn2@aol.com; James Henry; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Mike Lane; Natasha Henderson; Norb Birchmeier; Pete Levine; rob.nicholas@veolia.com; Robert Nicholas; rosejo@msu.edu; Russell Hudson; Samir Matta; Warren Green; wright.michael@epa.gov
Cc: Busch, Stephen (DEQ)
Subject: Re: TTHM Draft Letter
Attachments: Draft - Flint Letter to Healthcare Providers_Prysby_Wright.docx

Howard et al:

Please find my additions (including some Comments) attached using tracked changes based on Mike's version. I like his additions as well especially the LRAA language, although I did have a question on the softening text. Although I think this Letter is close to ready to be sent, please note that I do NOT recommend, due to inaccuracies, that you send the version of the TTHM Fact Sheet that you also attached. I can send you a revised version of that tomorrow. I have some concerns over some of the other files as well (e.g. the ycn one) and can provide another paper that examines the effects of both boiling/filtration on DBP concentrations that could be sent.

Please call me this week as well,

Mike Wright

PS: Please add my work email to the current Email list (wright.michael@epa.gov).

On Tuesday, March 17, 2015 1:26 PM, "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov> wrote:

Howard,

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

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

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

Team,

We have received our notice from the DEQ and our next step is to have this group preview the letter that we intend to send to the public along with it. I have forwarded everyone a draft of the letter for

any comments and I am also sending again all of the literature that was forwarded from Mr. Wright of the EPA and DR. Rose of MSU.

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

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

Thank you,

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

DRAFT Letter to Flint Healthcare Providers

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

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

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

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

Comment [mw1]: What's complete mean here?
Might be misconstrued that it was a one time action.
Can that parenthetically be put below when describing operational changes?

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

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

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

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

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

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

Sincerely,

Comment [mw2]: I'd recommend that you NOT send that version of the TTHM Fact Sheet due to inaccuracies. I can provide a revised version of that tomorrow.

Comment [mw3]: While I recognize the desire to emphasis Safe... Safety does not make sense here.