

Rennaker, Joanne (DEQ)

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

Tom,

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

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

If you need more information, contact Adam Rosenthal.

Richard

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number

LF68790

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3811 BRENTWOOD DR, FLINT
Collected By: REID SANDERS
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/14/2015 09:35
Date Received: 06/19/2015 11:02
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper:	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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Sample Number

LF63410

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	631 ALVORD AVE, FLINT	Source:	Single Family Dwelling
Collected By:	JANICE BERRYMAN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	05/06/2015 07:00
Sample Point:	MAIN BATHROOM	Date Received:	05/13/2015 11:26
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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810 267-3603

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AL : Action Level
RL : Reporting Limit

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

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

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Sample Number

LF68793

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1150 WOODSIDE DR, FLINT
Collected By: DEBORAH CONRAD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/14/2015 07:30
Date Received: 06/19/2015 11:02
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.029	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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AL : Action Level
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MPN : Most Probable Number
CFU : Colony Forming Unit

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



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

**Sample Number
LF63411**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	216 BROWNING AVE, FLINT	Source:	Single Family Dwelling
Collected By:	DEB	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	05/07/2015 08:00
Sample Point:	KITCHEN	Date Received:	05/13/2015 11:26
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.31	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.022	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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



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FAX: (517) 335-8562

**Sample Number
LF68023**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1807 OREN AVE, FLINT	Source:	Single Family Dwelling
Collected By:	MARK RUSSEL	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/08/2015 07:30
Sample Point:	BATHROOM	Date Received:	06/16/2015 11:11
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/17/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.021	06/17/2015	0.001	0.015	EPA 200.8	7439-92-1

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AL : Action Level
RL : Reporting Limit

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

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

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FAX: (517) 335-8562



**Sample Number
LF68794**

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **547 COPEMAN BLVD, FLINT**
Collected By: **LINDA LEE**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **06/14/2015 09:00**
Date Received: **06/19/2015 11:02**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.018	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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



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FAX: (517) 335-8562

Sample Number

LF57728

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1224 DECKER ST, FLINT	Source:	Single Family Dwelling
Collected By:	LOU ANNE MALIS	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/17/2015 06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.10	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.013	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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



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P.O. Box 30270
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TEL: (517) 335-8184
FAX: (517) 335-8582

Sample Number
LF70230

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1205 BLANCHARD AVE, FLINT	Source:	Single Family Dwelling
Collected By:	JOEL ARNOLD	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/24/2015 06:30
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.05	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.011	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70222

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **721 EAST ST APT #2, FLINT**
Collected By: **MELANIE POISSON**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **06/25/2015 06:30**
Date Received: **06/30/2015 11:14**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.16	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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MCL : Maximum Contaminant Level
AL : Action Level
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MPN : Most Probable Number
CFU : Colony Forming Unit

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



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**Sample Number
LF54946**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1809 STEVENSON ST, FLINT
Collected By: MIKE TAYLOR
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Private Citizen
Date Collected: 02/10/2015 06:30
Date Received: 02/19/2015 11:13
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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AL : Action Level
RL : Reporting Limit

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

Laboratory Contacts
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Systems Mgmt. Unit Mgr: George Kriazlian

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Sample Number

LF56223

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **4202 CUSTER AVE, FLINT**
Collected By: **JACQUELINE PEMBERTON**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **03/04/2015 08:00**
Date Received: **03/06/2015 11:33**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.27	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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810 257-3603

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AL: Action Level
RL: Reporting Limit

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

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



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Sample Number
LF56225

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	401 E NEWALL ST, FLINT	Source:	Single Family Dwelling
Collected By:	MARK CROMWELL SR	Site Code:	
Township/Well#/Section:	//	Collector:	Other
County:	Genesee	Date Collected:	03/02/2015 09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015 11:33
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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810 257-3603

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

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

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



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FAX: (517) 335-8562

Sample Number
LF56227

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2615 TRUMBULL AVE, FLINT	Source:	Single Family Dwelling
Collected By:	JENNIFER PEDERSON	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	02/27/2015 10:00
Sample Point:	KITCHEN	Date Received:	03/06/2015 11:33
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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



USEPA Region V Drinking Water Cert. No.: MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF54663

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **2205 FLUSHING RD, FLINT**
Collected By: **CHRIS BEATENHEAD**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **TYPE I**
Site Code:
Collector: **Public Water Supply Operator**
Date Collected: **02/15/2015 06:00**
Date Received: **02/17/2015 10:47**
Purpose: **Routine Monitoring**

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.13	02/18/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	02/18/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF57730

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **1220 DECKER ST, FLINT**
Collected By: **CARMEN PULIDO**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **03/17/2015 06:00**
Date Received: **03/24/2015 11:05**
Purpose: **Routine Monitoring**

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF57731

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1379 WASHINGTON, FLINT
Collected By: ROXANNE PUTMAN
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 03/19/2015 08:30
Date Received: 03/24/2015 11:05
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF57733

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1372 WASHINGTON AVE, FLINT	Source:	Single Family Dwelling
Collected By:	ANTHONY PALLADENO JR	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/19/2015 08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF57734



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1383 WASHINGTON AVE, FLINT
Collected By: ANTHONY PALLADENO III
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 03/19/2015 08:00
Date Received: 03/24/2015 11:05
Purpose: Routine Monitoring

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.17	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF57735

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1367 WASHINGTON AVE, FLINT	Source:	Single Family Dwelling
Collected By:	LEAH PALLADENO	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/17/2015 08:00
Sample Point:	MAIN BATHROOM	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.016	EPA 200.8	7439-92-1

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

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

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

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

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

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



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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57736

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1701 MARQUETTE DR, FLINT
Collected By: CHARMA DOMPREH
Township/Well/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 03/14/2015 09:40
Date Received: 03/24/2015 11:05
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.19	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF58413

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48605

System Name/Owner: CITY OF FLINT
Collection Address: 778 E BUNDY AVE, FLINT
Collected By: SANDRA HULL
Township/Well#/Section: //
County: Genesee
Sample Point: MAIN BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Private Citizen
Date Collected: 03/24/2015 08:25
Date Received: 03/31/2015 11:11
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF58414

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **3714 BEECHER RD, FLINT**
Collected By: **MELISSA MAYES**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **TYPE I**
Site Code:
Collector: **Private Citizen**
Date Collected: **03/24/2015 06:30**
Date Received: **03/31/2015 11:11**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.52	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
810 257-3603

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF59749

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1016 INGLESIDE AVE, FLINT
Collected By: JAMES D JARVIS
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 04/09/2015 07:00
Date Received: 04/14/2015 11:07
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.07	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003



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

Sample Number
LF59750

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1818 ROCK CREEK LN, FLINT	Source:	Single Family Dwelling
Collected By:	HELEN HUNTER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	04/06/2015 06:50
Sample Point:	MAIN BATHROOM	Date Received:	04/14/2015 11:07
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF59751

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3010 CHEYENNE ST, FLINT
Collected By: GERTRUDE MARSHALL
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 04/03/2015 08:50
Date Received: 04/14/2015 11:07
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.10	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003



P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF60546

Official Laboratory Report

Report To: **MIKE GLASGOW**
4500 N DORT HWY
FLINT MI 48605

System Name/Owner: **CITY OF FLINT**
Collection Address: **2806 MOUNTAIN AVE, FLINT**
Collected By: **MARIBETH PEREZ**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **KITCHEN**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **Single Family Dwelling**
Site Code:
Collector: **Private Citizen**
Date Collected: **04/15/2015 12:00**
Date Received: **04/21/2015 10:41**
Purpose: **Routine Monitoring**

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	04/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48602-1540
810 257-3603

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

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

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



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

Sample Number
LF61845

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2020 CROOKED LN, FLINT
Collected By: TRACY & MIKE SARGENT
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 04/24/2015 07:00
Date Received: 05/04/2015 10:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.10	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8582

Sample Number
LF61846

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	310 E MOORE ST, FLINT	Source:	Single Family Dwelling
Collected By:	HUSTON BOLDEN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	04/22/2015 07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015 10:21
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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



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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF64283

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3714 BEECHER RD, FLINT	Source:	Single Family Dwelling
Collected By:	MELISSA MAYS	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	05/14/2015 06:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015 11:24
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.15	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48602-1540
810 257-3603

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

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

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



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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF64285

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 912 LEXINGTON AVE, FLINT
Collected By: LAURA HATT
Township/Well#/Section: //
County: Genesee
Sample Point: MAIN BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 05/15/2015 09:00
Date Received: 05/20/2015 11:24
Purpose: Routine Monitoring

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
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MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

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

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



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

**Sample Number
LF67423**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	344 ROBBIE LN, FLINT	Source:	Single Family Dwelling
Collected By:	CASSANDRA BROWN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/31/2015 08:15
Sample Point:	BATHROOM	Date Received:	06/11/2015 10:51
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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



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

**Sample Number
LF67424**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	357 ROBBIE LN, FLINT	Source:	Single Family Dwelling
Collected By:	FRANK EVANS	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	05/31/2015 08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015 10:51
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.20	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF67425

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	328 ROBBIE LN, FLINT	Source:	Single Family Dwelling
Collected By:	WILLIE TURNER	Site Code:	
Township/Well/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	05/30/2015 06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015 10:51
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.09	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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

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

Sample Number
LF67427

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 353 ROBBIE LN, FLINT
Collected By: ZETAN EVANS
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 05/30/2015 06:45
Date Received: 06/11/2015 10:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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AL : Action Level
RL : Reporting Limit

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

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



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**Sample Number
LF67428**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 349 ROBBIE LN, FLINT
Collected By: DORIS NUNN
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 05/31/2015 08:00
Date Received: 06/11/2015 10:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF68792

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 853 E 7TH ST, FLINT
Collected By: LAURA STUDACHER
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/12/2015 06:30
Date Received: 06/19/2015 11:02
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.07	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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AL : Action Level
RL : Reporting Limit

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

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



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

Sample Number
LF68791

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1815 S FRANKLIN AVE, FLINT	Source:	Single Family Dwelling
Collected By:	VIVAN GRIER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/14/2015 09:45
Sample Point:	KITCHEN	Date Received:	06/19/2015 11:02
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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AL : Action Level
RL : Reporting Limit

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF68788

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	421 LYON ST, FLINT	Source:	Single Family Dwelling
Collected By:	SAMUEL J CONDE	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/14/2015 08:34
Sample Point:	KITCHEN	Date Received:	06/19/2015 11:02
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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



USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF68789

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	1528 DELAWARE AVE, FLINT	Source:	Single Family Dwelling
Collected By:	CAROL PARKER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/12/2015 05:23
Sample Point:	KITCHEN	Date Received:	06/19/2015 11:02
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF69622



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 920 STOCKER AVE, FLINT
Collected By: MICHAEL TAYLOR
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/21/2015 10:30
Date Received: 06/25/2015 11:52
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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



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

Sample Number
LF69623

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	742 LINCOLN AVE, FLINT	Source:	Single Family Dwelling
Collected By:	DANA STIF	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/19/2015 07:00
Sample Point:	KITCHEN	Date Received:	06/25/2015 11:52
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION				REGULATORY INFORMATION		
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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DRINKING WATER LABORATORY**

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF69624



Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3517 BENNETT AVE, FLINT	Source:	Single Family Dwelling
Collected By:	RANDOLPH FREEMAN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/24/2015 05:05
Sample Point:	KITCHEN	Date Received:	06/25/2015 11:52
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF69625



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1730 OVERHILL DR, FLINT
Collected By: PETER M BADE
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 08/22/2015 05:30
Date Received: 08/25/2015 11:52
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.08	08/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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



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DRINKING WATER LABORATORY**

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8582

Sample Number

LF69626

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2117 STANFORD AVE, FLINT
Collected By: CHIMENE HILL
Township/Well#/Section: //
County: Genesee
Sample Point: MAIN BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/23/2015 08:20
Date Received: 06/25/2015 11:52
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.08	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF69627



Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2432 BETA LN, FLINT	Source:	Single Family Dwelling
Collected By:	JON KINGEN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/21/2015 07:00
Sample Point:	KITCHEN	Date Received:	06/25/2015 11:52
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003



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

Sample Number
LF69628

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2023 MILLER RD, FLINT	Source:	Single Family Dwelling
Collected By:	CAROL A HIGGINS	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/21/2015 11:00
Sample Point:	KITCHEN	Date Received:	06/25/2015 11:52
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	06/26/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/26/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

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

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



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USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF70223

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	3814 WHITTIER, FLINT	Source:	Single Family Dwelling
Collected By:	BRIAN URCH	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/25/2015 07:33
Sample Point:	BATHROOM	Date Received:	06/30/2015 11:14
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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



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USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LF70224**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3120 NORWOOD DR, FLINT
Collected By: TOM HUTCHINGS
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/24/2015 06:20
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

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

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

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MCL: Maximum Contaminant Level
AL: Action Level
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mg/L: milligrams / Liter (ppm)
ppm: parts per million
MPN: Most Probable Number
CFU: Colony Forming Unit

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

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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70225

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2122 PIERCE ST, FLINT
Collected By: KATHLEEN REID
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/21/2015 07:00
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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Flint, MI 48502-1540
810 257-3603

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70226



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3521 BENNETT AVE, FLINT
Collected By: BRENT WRIGHT
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/25/2015 06:35
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-60-8
Lead	0.003	07/01/2015	0.01	0.015	EPA 200.8	7439-92-1

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

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

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

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

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



USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8662

**Sample Number
LF70227**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1602 RASPBERRY LN, FLINT
Collected By: BRAD FARRAR
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/24/2015 07:15
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

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

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70228

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1809 LYNBROOK, FLINT
Collected By: DAWN STEELE
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/26/2015 04:35
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70229



Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2112 SHERFF, FLINT	Source:	Single Family Dwelling
Collected By:	KAREN EATON	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/24/2015 09:30
Sample Point:	KITCHEN	Date Received:	06/30/2015 11:14
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.009	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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



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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF70231

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48605

System Name/Owner: CITY OF FLINT
Collection Address: 880 SCHAFER ST, FLINT
Collected By: DERRICK JONES
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/26/2015 05:27
Date Received: 06/30/2015 11:14
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	07/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48602-1540
810 257-3603

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71158

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2110 FLUSHING RD, FLINT
Collected By: SHELLY SANETRIK
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/30/2015 08:34
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.10	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1640
810 257-3603

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71159



Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2300 FLUSHING RD, FLINT	Source:	Single Family Dwelling
Collected By:	CONSTANCE VAUGHN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/29/2015 09:30
Sample Point:	BATHROOM	Date Received:	07/07/2015 11:34
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.28	07/08/2015	0.06	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71160

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2130 FLUSHING RD, FLINT
Collected By: ROSARIO
Township/Well#/Section: //
County: Genesee
Sample Point: BASEMENT
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/28/2015 17:46
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.05	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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DRINKING WATER LABORATORY**

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71162

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2202 FLUSHING RD, FLINT
Collected By: BARBARA NELSON
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/29/2015 06:30
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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



USEPA Region V Drinking Water Cert. No. MI00003

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

**Sample Number
LF71163**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2429 FLUSHING RD, FLINT
Collected By: ROLAND WATSON
Township/Well/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/30/2015 08:00
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.06	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



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

**Sample Number
LF71165**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4013 BROWNELL BLVD, FLINT
Collected By: ADRIAN AND PHYLLIS JONES
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 08/29/2015 08:30
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.08	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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DRINKING WATER LABORATORY**

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71166



Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	2414 FLUSHING RD, FLINT	Source:	Single Family Dwelling
Collected By:	MICHELLE AND MICHAEL REED	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/30/2015 07:30
Sample Point:	KITCHEN	Date Received:	07/07/2015 11:34
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8582

Sample Number

LF71167



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1914 PENBROOK LN, FLINT
Collected By: KARL ADKINS
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/29/2015 06:00
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71168

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3901 LEERDA ST, FLINT
Collected By: CARNETTA CARTER
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/26/2015 08:25
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

**Sample Number
LF71169**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3142 MCCLURE, FLINT
Collected By: BOB FARRAR
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 08/26/2015 08:20
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF71170



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2114 FLUSHING RD, FLINT
Collected By: DAVID PAVLOVICH
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Private Citizen
Date Collected: 06/29/2015 08:00
Date Received: 07/07/2015 11:34
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.05	07/08/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	07/08/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF72033

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	709 FROST ST, FLINT	Source:	Single Family Dwelling
Collected By:	MAURCICA GUYNN	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	06/30/2015 08:15
Sample Point:	BATHROOM	Date Received:	07/10/2015 10:36
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	07/13/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	07/13/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

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

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

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

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



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*

Owner/Location Information:CITY OF FLINT
341 ROBBIE LN
FLINT MI 48605

Sample Number: LLF67426

Sample/Collection Information:WSSN:
County: Genesee
Township:
Section:
Well #:
Collection Date: 5/31/2015 6:00:00 AM
Arrival Date: 6/11/2015 10:51:10 AMSite Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: FLORISSA STEBBINS

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
7440-50-8	COPPER (RECOVERABLE)	0.05	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	0.003	0.001	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:23:55 EDT
2015



Michigan Department of Environmental Quality

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

Owner/Location Information:

CITY OF FLINT
215 BROWNING AVE
FLINT MI 48507

Sample Number: LLF56226

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 3/2/2015 6:30:00 AM
Arrival Date: 3/6/2015 11:33:07 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: KEVIN & JENNIFER STARNES

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
7440-50-8	COPPER (RECOVERABLE)	0.16	0.05	mg/L	EPA 200.8
7439-92-1	LEAD (TOTAL)	ND	0.001	mg/L	EPA 200.8

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:17:25 EDT
2015



Michigan Department of Environmental Quality

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

Owner/Location Information:

CITY OF FLINT
201 BROWNING AVE
FLINT MI 48507

Sample Number: LLF56228

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 3/5/2015 9:30:00 AM
Arrival Date: 3/6/2015 11:33:08 AM

Site Code:
Water Source: Single Family Dwelling
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN
Collector: Private Citizen
Collected By: FLOYD BELL

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

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 4 14:17:49 EDT
2015

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Tuesday, September 08, 2015 12:21 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Poy, Thomas
Subject: FW: Reporter inquiry --> link to reporter story from Friday

I'm hoping that DEQ's Lead Public Education will become priority reading materials for citizens, so they know how to be proactive; instead of reading articles like this and being reactive.

Any idea when DPH will have their PE ready to distribute?

Jennifer

From: Porter, Andrea
Sent: Tuesday, September 08, 2015 10:29 AM
To: Deltoral, Miguel; Poy, Thomas; Bair, Rita; Damato, Nicholas
Cc: Shoven, Heather; Crooks, Jennifer
Subject: RE: Reporter inquiry --> link to reporter story from Friday

Hi All,

There is already a story by Jessica Dupnack that was aired on Friday:

<http://www.abc12.com/home/headlines/Flint-mother-said-the-water-gave-her-son-Lead-poisoning-324496551.html>

Thanks,
 Andrea Porter

Environmental Engineer
 Ground Water & Drinking Water Branch
 U.S. EPA, Region 5 (WG-15J)
 77 W. Jackson Blvd.
 Chicago, IL 60604
 Phone: 312-886-4427
 Fax: 312-697-2656

From: Deltoral, Miguel
Sent: Tuesday, September 08, 2015 7:12 AM
To: Poy, Thomas; Bair, Rita; Damato, Nicholas
Cc: Porter, Andrea; Shoven, Heather; Crooks, Jennifer
Subject: Reporter inquiry

Just FYI - I had a voicemail from Jessica Dupnack (a reporter in MI) regarding the Walters' sample results and I forwarded it to Pete Cassell as requested.

Miguel A. Del Toral

Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, September 03, 2015 3:45 PM
To: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Cc: Poy, Thomas; Porter, Andrea
Subject: question: Ms Walters' home

See my question below and Miguel's response—I guess if the Walters are still using bottled water for drinking and cooking, then they probably wouldn't have any type of GAC filter or RO unit on their house, but we don't know. If the Walters still have their iron filter at the entry point to their home, I wonder if the chlorine could be oxidizing iron.
 Jennifer

From: Deltoral, Miguel
Sent: Wednesday, September 02, 2015 8:23 AM
To: Crooks, Jennifer; Poy, Thomas; Porter, Andrea
Subject: Re: question: Ms Walters' home

I haven't spoken to her so I don't know, but information on the Flint Water Update website, which is recent, says that the Walters are still using bottled water for drinking/cooking.

Miguel A. Del Toral
 Regulations Manager
 U.S. EPA R5 GWDWB
 77 West Jackson Blvd, (WG-15J)
 Chicago, IL 60604
 Phone: (312) 886-5253

From: Crooks, Jennifer
Sent: Tuesday, September 1, 2015 02:09 PM
To: Deltoral, Miguel; Poy, Thomas; Porter, Andrea
Subject: question: Ms Walters' home

Hi, Miguel. We had a call yesterday with MDEQ and were discussing Marc Edwards' website. MDEQ thought that Ms Walters' home has a whole house filter that would remove chlorine in addition to lead and other contaminants, such as a GAC filter. I said that when you and I were out there in late April/May, that there was no whole house GAC filter or other tap or under-sink filter; she had an iron filter at the entry point to her home—but an iron filter wouldn't remove chlorine, though chlorine could oxidize the iron. Do you know if Ms Walters' has installed a whole house GAC filter, or tap GAC filter or under-sink GAC filter since May?

Jennifer

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, September 03, 2015 1:22 PM
To: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Water

Below is a note from Howard Croft to our TAC team concerning the return to compliance for TTHMs. Howard also briefly discusses the lead issue and the city's plans to install optimal corrosion control.

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

From: Howard Croft [<mailto:hcroft@cityofflint.com>]
Sent: Thursday, September 03, 2015 12:28 PM
To: Brent Wright; Dayne Walling; donna. cole; Gerald (Jed) Natzke; Gerald Ambrose; Howard Croft; James Henry; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Michael Wright; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Warren Green
Subject: Flint Water

Technical Advisory Team,

I am pleased to report that the City of Flint has officially returned to compliance with the Michigan Safe Drinking Water Act and we have received confirming documentation from the DEQ today. The GAC filtering was installed on time and was instrumental in our ability to maintain an average level under the MCL. We anticipate that we will have no further notices going out.

Recent testing has raised questions regarding the amount of lead that is being found in the water and I wanted to report to you our current status.

At the onset of our plant design, optimization for lead was addressed and discussed with the engineering firm and with the DEQ. It was determined that having more data was advisable prior to the commitment of a specific optimization method. Most chemicals used in this process are phosphate based and phosphate can be a "food" for bacteria. We have performed over one hundred and sixty lead tests throughout the city since switching over to the Flint River and remain within the EPA standards.

We are currently designing an optimization plan with the engineering firm that will be presented to the DEQ and upon approval we expect to have it implemented by January 2016. It is worthwhile to note that the DEQ has reported that other cities have taken years to complete an optimization plan and we anticipate having a plan in place over the next four months.

It is also worth noting to this group that there are different lead testing methods used within industry and the city remains consistent with the most recent EPA approved testing method which can produce different results than other methods.

We hope to schedule another TAC team meeting for late September or early October, I will attempt to keep everyone informed and look for the best dates. We are inviting additional EPA experts to become a part of this committee.

Thank you,

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

Rennaker, Joanne (DEQ)

From: Poy, Thomas <poy.thomas@epa.gov>
Sent: Thursday, September 03, 2015 1:02 PM
To: Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Hyde, Tinka; Henry, Timothy; Bair, Rita; Damato, Nicholas; Crooks, Jennifer
Subject: RE: Flint Meeting

Thanks for the email.

I hope that Flint will utilize the expertise of MDEQ field staff and ORD distribution system staff to help them identify water quality and pipe conditions that need to be considered in the effective implementation of phosphate treatment.

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

From: Benzie, Richard (DEQ) [<mailto:BENZIER@michigan.gov>]
Sent: Thursday, September 03, 2015 9:21 AM
To: Poy, Thomas
Cc: shekterl@michigan.gov
Subject: FW: Flint Meeting

FYI

From: Prysby, Mike (DEQ)
Sent: Thursday, September 03, 2015 9:06 AM
To: Benzie, Richard (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Meeting

Richard,

I spoke this morning with Mike Glasgow (Utility Administrator) and Brent Wight (WTP Supt) to see what came out of their meeting with LAN and the city. The meeting's main focus was over the lawsuit and financial issues; however, corrosion control treatment was also discussed. City administration told Mike and Brent that there will be no funding restrictions to install corrosion control. The capital cost to install treatment (P04 feed system) is not expected to be high since the WTP has existing feed lines and equip in place; however, new properly sized pumps will be needed. Mike expects LAN to have a proposal for us to review and approve for issuance of an Act 399 construction permit within the next one to two months.

Michael Prysby, P.E.

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

From: Benzie, Richard (DEQ)
Sent: Wednesday, September 02, 2015 5:13 PM
To: Prysby, Mike (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Meeting

Do we know how this meeting concluded?

From: Poy, Thomas [<mailto:poy.thomas@epa.gov>]
Sent: Wednesday, September 02, 2015 4:23 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint Meeting

Liane/Richard:
How did Flint's meeting with their consultant go? Did they decide to implement treatment?

Tom

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

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Thursday, September 03, 2015 12:28 PM
To: Brent Wright; Dayne Walling; donna. cole; Gerald (Jed) Natzke; Gerald Ambrose; Howard Croft; James Henry; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; larry.koehler@mcc.edu; Laura Sullivan; Michael Glasgow; Michael Wright; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; rosejo@msu.edu; Russell Hudson; Samir Matta; Warren Green
Subject: Flint Water

Technical Advisory Team,

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 Recent testing has raised questions regarding the amount of lead that is being found in the water and I wanted to report to you our current status.

At the onset of our plant design, optimization for lead was addressed and discussed with the engineering firm and with the DEQ. It was determined that having more data was advisable prior to the commitment of a specific optimization method. Most chemicals used in this process are phosphate based and phosphate can be a "food" for bacteria. We have performed over one hundred and sixty lead tests throughout the city since switching over to the Flint River and remain within the EPA standards.

We are currently designing an optimization plan with the engineering firm that will be presented to the DEQ and upon approval we expect to have it implemented by January 2016. It is worthwhile to note that the DEQ has reported that other cities have taken years to complete an optimization plan and we anticipate having a plan in place over the next four months.

It is also worth noting to this group that there are different lead testing methods used within industry and the city remains consistent with the most recent EPA approved testing method which can produce different results than other methods.

We hope to schedule another TAC team meeting for late September or early October, I will attempt to keep everyone informed and look for the best dates. We are inviting additional EPA experts to become a part of this committee.

Thank you,

--

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

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Thursday, September 03, 2015 11:20 AM
To: Wurfel, Brad (DEQ); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Subject: RE: steve busch

If he needs to talk to someone here, Mike Prysby was the one who contacted Flint officials to learn what was decided at the meeting held Tuesday between the city and their consultant to discuss a number of issues including the possibility of optimizing their treatment for corrosion control. Mike provided an update that I forwarded to Region 5 EPA as they were asking about the status.

But this information is best obtained from the city officials that Mike contacted to learn what was discussed.

Richard

From: Wurfel, Brad (DEQ)
Sent: Thursday, September 03, 2015 11:16 AM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: FW: steve busch

What do we want to do with this today? Seems Steve's outta here.

b

From: Ronald Fonger [<mailto:RFONGER1@mlive.com>]
Sent: Thursday, September 03, 2015 11:03 AM
To: Wurfel, Brad (DEQ)
Subject: steve busch

Brad:

We are planning to follow up on the issue of Flint optimizing its water system to further limit exposure to lead from plumbing in homes.

I left messages we Steve Busch Wednesday and again this morning and am expecting to get some information from the city on what it's doing or considering.

Any help in getting a minute with Steve would be appreciated.

Thanks for this and your help yesterday,

Ron Fonger
 MLive Media Group
 Reporter

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

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Thursday, September 03, 2015 11:19 AM
To: Wurfel, Brad (DEQ)
Cc: Benzie, Richard (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Meeting

FYI – seems if the reporter is interested in knowing what the city is planning to do, it's best to contact the city. What we have is third hand.

From: Benzie, Richard (DEQ)
Sent: Thursday, September 03, 2015 10:21 AM
To: Poy, Thomas (poy.thomas@epa.gov)
Cc: Shekter Smith, Liane (DEQ)
Subject: FW: Flint Meeting

FYI

From: Prysby, Mike (DEQ)
Sent: Thursday, September 03, 2015 9:06 AM
To: Benzie, Richard (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Meeting

Richard,

I spoke this morning with Mike Glasgow (Utility Administrator) and Brent Wight (WTP Supt) to see what came out of their meeting with LAN and the city. The meeting's main focus was over the lawsuit and financial issues; however, corrosion control treatment was also discussed. City administration told Mike and Brent that there will be no funding restrictions to install corrosion control. The capital cost to install treatment (P04 feed system) is not expected to be high since the WTP has existing feed lines and equip in place; however, new properly sized pumps will be needed. Mike expects LAN to have a proposal for us to review and approve for issuance of an Act 399 construction permit within the next one to two months.

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

From: Benzie, Richard (DEQ)
Sent: Wednesday, September 02, 2015 5:13 PM
To: Prysby, Mike (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Meeting

Do we know how this meeting concluded?

From: Poy, Thomas [mailto:poy.thomas@epa.gov]
Sent: Wednesday, September 02, 2015 4:23 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint Meeting

Liane/Richard:
How did Flint's meeting with their consultant go? Did they decide to implement treatment?

Tom

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

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Thursday, September 03, 2015 11:18 AM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: FW: U.S. EPA Lead Expert

And also, this.

b

From: Ronald Fonger [<mailto:RFONGER1@mlive.com>]
Sent: Thursday, September 03, 2015 11:13 AM
To: Wurfel, Brad (DEQ)
Subject: FW: U.S. EPA Lead Expert

Brad:

Can you help me with some information from the DEQ regarding this email, sent by the U.S. EPA enforcement team leader in Region 5?

It seems to say the U.S. EPA has offered the city the assistance of a lead expert and sent the information to the DEQ as well. I'm following up the a PR contact at the U.S. EPA on this and about the more general federal interest in the lead in water issue in Flint.

Thanks,

Ron Fonger
 MLive Media Group
 Reporter

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

From: Arthur Woodson [mailto:arthurlw_2000@yahoo.com]
Sent: Thursday, September 03, 2015 9:52 AM
To: Ronald Fonger
Subject: Fw: U.S. EPA Lead Expert

From: Shoven, Heather <shoven.heather@epa.gov>;
To: arthurlw_2000@yahoo.com <arthurlw_2000@yahoo.com>;
Subject: U.S. EPA Lead Expert
Sent: Mon, Aug 31, 2015 5:55:41 PM

Dear Mr. Woodson:

Thank you for your call on Friday.

In follow-up to your inquiry on U.S. EPA lead experts, I had a conversation with Dr. Darren Lytle, who is the Acting Chief of the Treatment Technology Evaluation Branch in the Water Supply and Water Resources Division within EPA's Office of Research and Development. Scientists within Dr. Lytle's branch have expertise in drinking water treatment including corrosion control to address lead contamination. We passed along Dr. Lytle's information to both MDEQ and Flint's Mayor, Dayne Walling, for consideration to work with Flint's Technical Advisory Committee.

You mentioned that you wanted to provide the Flint City Council with this information since Mayor Walling has not shared EPA's assistance offer with the Council. I have left a voicemail message with Councilwoman Monica Galloway regarding your inquiry since it is critical that the Council work with the City and the State to discuss next steps for the Flint Water system.

Please let me know if you have any follow-up questions.

Best wishes,

Heather

Heather A. Shoven | Enforcement Team Leader | U.S. Environmental Protection Agency, Region 5

Ground Water and Drinking Water Branch | 77 W. Jackson Blvd (WG-15J) | Chicago, IL 60604 | 312-886-0153

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Thursday, September 03, 2015 11:16 AM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ)
Subject: FW: steve busch

What do we want to do with this today? Seems Steve's outta here.
b

From: Ronald Fonger [<mailto:RFONGER1@mlive.com>]
Sent: Thursday, September 03, 2015 11:03 AM
To: Wurfel, Brad (DEQ)
Subject: steve busch

Brad:
We are planning to follow up on the issue of Flint optimizing its water system to further limit exposure to lead from plumbing in homes.
I left messages we Steve Busch Wednesday and again this morning and am expecting to get some information from the city on what it's doing or considering.
Any help in getting a minute with Steve would be appreciated.
Thanks for this and your help yesterday,

Ron Fonger
MLive Media Group
Reporter

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

Rennaker, Joanne (DEQ)

From: Rennaker, Joanne (DEQ)
Sent: Thursday, September 03, 2015 9:07 AM
To: Prysby, Mike (DEQ)
Subject: FW: Flint TTHM 3rd quarter letter
Attachments: Flint DBP 3Q15-revised.doc

For your records.

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 02, 2015 9:14 AM
To: Rennaker, Joanne (DEQ)
Cc: Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: Flint TTHM 3rd quarter letter

Jo Anne,

I believe the attached is ready to be finalized.

I would like a pdf of the signed letter to email over to members of the legislature.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

September 2, 2015

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: City of Flint – Water Supply
Return to Compliance Total Trihalomethanes (TTHM)
3rd Quarter 2015 Monitoring Period

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

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

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

Mr. Brent Wright

2

September 2, 2015

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

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

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

Sincerely,

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

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

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, September 03, 2015 9:06 AM
To: Benzie, Richard (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Meeting

Richard,

I spoke this morning with Mike Glasgow (Utility Administrator) and Brent Wight (WTP Supt) to see what came out of their meeting with LAN and the city. The meeting's main focus was over the lawsuit and financial issues; however, corrosion control treatment was also discussed. City administration told Mike and Brent that there will be no funding restrictions to install corrosion control. The capital cost to install treatment (P04 feed system) is not expected to be high since the WTP has existing feed lines and equip in place; however, new properly sized pumps will be needed. Mike expects LAN to have a proposal for us to review and approve for issuance of an Act 399 construction permit within the next one to two months.

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

From: Benzie, Richard (DEQ)
Sent: Wednesday, September 02, 2015 5:13 PM
To: Prysby, Mike (DEQ)
Cc: Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Meeting

Do we know how this meeting concluded?

From: Poy, Thomas [<mailto:poy.thomas@epa.gov>]
Sent: Wednesday, September 02, 2015 4:23 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint Meeting

Liane/Richard:
 How did Flint's meeting with their consultant go? Did they decide to implement treatment?

Tom

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

Rennaker, Joanne (DEQ)

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Sent: Wednesday, September 02, 2015 5:13 PM
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Tom Poy
Chief, Ground Water and Drinking Water Branch
USEPA - Region 5
(312) 886-5991

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, September 02, 2015 3:39 PM
To: Busch, Stephen (DEQ)
Subject: Flint PBCU 90th letter
Attachments: PB-CU 90th Q1-2 2015.pdf

Steve,

Attached is a signed PDF of our PBCU 90th letter to Flint.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

September 2, 2015

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

WSSN: 02310

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3rd Quarter 2015 Monitoring Period

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Mr. Brent Wright

2

September 2, 2015

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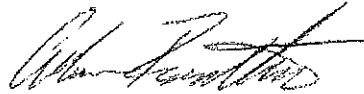
The DEQ encourages the City to continue informing customers about this updated water quality information and compliance with the TTHM MCL standard.

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

Sincerely,



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



Adam Rosenthal, Environmental Quality
Analyst
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cc: Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5
Mr. Robert Bincsik, City of Flint
Mr. Howard Croft, City of Flint
Mr. Michael Glasgow, City of Flint
Genesee County Health Department
Mr. Stephen Busch, DEQ

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

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Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Wednesday, September 02, 2015 2:53 PM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Subject: RE: DRAFT Flint Journal response -- edit, add and subtract from this as you see fit. Need it asap. Thanks!
Attachments: Editorial response to Virginia Tech testing Flint homes for lead.doc

Here's my final version. It is much easier to read if 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. I assume Liane will transmit it to Brad. If not, let me know.

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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 02, 2015 11:52 AM
To: Wurfel, Brad (DEQ); Prysby, Mike (DEQ); Shekter Smith, Liane (DEQ)
Subject: RE: lead in flint water

I'm in until 4:30 today and then out until Tuesday, so now is the time.

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

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Sent: Wednesday, September 02, 2015 11:39 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: FW: lead in flint water

Okay, friends. Time to compose all we've been discussing. I'm working up something for the Flint Journal.

Mike, please continue to not engage this one until we've formally responded. Then we can use you and Steve to bat cleanup on any questions Fonger may have.

Steve, have you got a few minutes for me to bounce some stuff off you today?
 b

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

Thanks,

Ron Fonger

MLive Media Group

Reporter

mobile 810.347.9963

email rfonger1@mlive.com

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

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Wednesday, September 02, 2015 11:39 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)
Subject: FW: lead in flint water

Okay, friends. Time to compose all we've been discussing. I'm working up something for the Flint Journal.

Mike, please continue to not engage this one until we've formally responded. Then we can use you and Steve to bat cleanup on any questions Fonger may have.

Steve, have you got a few minutes for me to bounce some stuff off you today?
b

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,

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MLive Media Group
Reporter

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, September 02, 2015 9:14 AM
To: Rennaker, Joanne (DEQ)
Cc: Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: Flint TTHM 3rd quarter letter
Attachments: Flint DBP 3Q15-revised.doc

Jo Anne,

I believe the attached is ready to be finalized.

I would like a pdf of the signed letter to email over to members of the legislature.

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

September 3, 2015

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: City of Flint – Water Supply
 Return to Compliance Total Trihalomethanes (TTHM)
 3rd Quarter 2015 Monitoring Period

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

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

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

Mr. Brent Wright

2

September 3, 2015

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

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

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

Sincerely,

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

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

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, September 01, 2015 4:23 PM
To: Wurfel, Brad (DEQ)
Subject: FW: Flint Lead
Attachments: Flint PbCu15.doc

Brad,

Ron Fonger left me a voicemail concerning questions he has concerning the lead issue in Flint. Specifically, he is aware of the increased discussion of lead in Flint's drinking water and the home tests recently performed at residents request in corroboration with V Tech and concerned groups. Ron discussed this issue w. Mr. Kroft and has the impression that the DEQ has had discussions with the city about the lead issue; however, Mr. Kroft declined to discuss the issue any further. Mr. Fonger wishes to discuss with the DEQ as to what discussions the DEQ has had with the city concerning the lead issue. Can you return Ron's call pertaining to any discussions that the DEQ has had with Mr. Kroft or the city. I am not aware of any verbal discussions. Our written correspondence was the 90th percentile letter that we recently sent to the city acknowledging that they met the lead and copper 90% percentile limits in their most recent round of monitoring (Jan-June 2015). See attached.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

August 17, 2015

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

Dear Mr. Wright:

SUBJECT: Flint, City of WSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), received your report for the monitoring period January 1, 2015, through June 30, 2015.

Action Levels	Results this monitoring period			
	90th Percentile	# of Samples Above Action Level	# of Samples Required	# of Samples Collected
Lead 15 parts per billion (ppb)	11 ppb	6	60	69
Copper 1.3 parts per million (ppm)	0.16 ppm	0	60	69

Ninety percent or more of the sites you tested are within action levels under the administrative rules promulgated under the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). These results must be reported on your 2015 Consumer Confidence Report (CCR) due to our office, your customers, and the local health department, by July 1, 2016. Also include the following statement in the CCR, regardless of the lead and copper levels:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at <http://www.water.epa.gov/drink/info/lead>.

Mr. Brent Wright

2

August 17, 2015

Recent changes to the Lead and Copper Rule (LCR) require the water supply to provide individual lead tap results to people who receive water from sites that were sampled, even if lead was not detected, within 30 days of learning of results. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice by three months after the end of the monitoring period. To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit <http://www.michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms under the Manuals, Forms and Brochures heading. Water supplies that fail 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."

While the City's LCR compliance monitoring has continued to meet action level requirements, the LCR also requires all large systems (those serving over 50,000 people) to optimize corrosion control regardless of their 90th percentile lead concentration. One way to demonstrate fully optimized corrosion control treatment is through two consecutive six month rounds of LCR compliance monitoring in which the difference between the 90th percentile level and the highest source water lead concentration is less than the Practical Quantitative Level for lead (0.005 milligrams per liter). Since the City did not meet these criteria in both the July – December 2014, and January – June 2015, sampling periods, the City must now recommend a treatment to fully optimize corrosion control treatment within six months in accordance with requirements under Act 399, Administrative Rule 604f (R 325.10604f). **This recommendation must be provided to our office as soon as possible, but no later than January 1, 2016.**

However, given the past use of phosphate treatment by the Detroit Water and Sewerage Department (DWSD) to fully optimize corrosion control treatment when the City was a wholesale customer of DWSD, the ODWMA recommends the City select this as its recommended treatment option, and begin implementation as soon as possible to address ongoing concerns by customers regarding lead levels within their premise plumbing systems. Under the second step of this Rule, the DEQ can specify optimal corrosion control treatment.

Our office will inform you when monitoring needs to be conducted as part of the optimization of the implemented corrosion control treatment. Customer requested samples for lead shall continue to be collected and analyzed. Please make every attempt to select the same sites used in the previous monitoring period, giving Tier 1 sites first priority. If original sites are unavailable, select replacement sites based on the Tier 1, 2, and 3 criteria.

Please contact me at 517-284-6644 or rosenthala@michigan.gov at your earliest convenience to discuss how the City will be complying with the above requirements.

Sincerely,

Adam Rosenthal, Environmental Quality Analyst
Lansing District Office
Office of Drinking Water and Municipal Assistance

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, September 01, 2015 4:13 PM
To: Busch, Stephen (DEQ)
Subject: RE: Flint Lead

Will do.

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, September 01, 2015 4:12 PM
To: Prysby, Mike (DEQ)
Subject: Re: Flint Lead

Please ask brad to respond

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

Sent from my iPhone

On Sep 1, 2015, at 3:44 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Steve,

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

Michael Prysby, P.E.

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

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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, September 01, 2015 3:50 PM
To: Hansen, Jeff; 'bwright@cityofflint.com'; Michael Glasgow
Subject: RE: Flint OER - Response to May 2015 TTHM Sampling
Attachments: 3rd Qtr 2015 TTHM summary.doc

Jeff, Brent, Michael

Attached is DEQ's summary of TTHM concentrations for the past 4 quarters including the LRAA and OEL calculation. This table is aligned correctly between locations (addresses) and site codes and needs to be used by city.

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

From: Hansen, Jeff [mailto:jrhanzen@lan-inc.com]
Sent: Tuesday, September 01, 2015 3:42 PM
To: Prysby, Mike (DEQ)
Cc: hcroft@cityofflint.com; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Robert Bincsik (rbincsik@cityofflint.com); Matta, Samir; Green, Warren; Luoma, Steve
Subject: Flint OER - Response to May 2015 TTHM Sampling

Hi Mike,

On behalf of the City of Flint, attached is a PDF version of the latest Operational Evaluation Report required in response to the TTHM violation in May 2015. Hard copies will be sent out today.

Jeffrey R. Hansen
 Senior Project Manager



**Lockwood, Andrews
& Newnam, Inc.**
 A FIDEX DAILY COMPANY

1311 South Linden Road, Suite B • Flint, MI 48532
 T 810.820.2682 C 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

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02310 – City of Flint 3rd Quarter 2015 TTHMs

August 28, 2015

TTHM Results (mg/L)						
	11/20/14	2/17/15	5/18/15	8/18/15	LRAA	OEL
DBP1 McDonalds 3719 Davison	0.059	0.0162	0.0514	0.0755	0.050	0.055
DBP2 Liquor Palace 3302 South Dort Highway	0.033	0.0168	0.0635	0.0532	0.042	0.047
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Rennaker, Joanne (DEQ)

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

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

Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Tuesday, September 01, 2015 3:42 PM
To: Prysby, Mike (DEQ)
Cc: hcroft@cityofflint.com; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Robert Bincsik (rbincsik@cityofflint.com); Matta, Samir; Green, Warren; Luoma, Steve
Subject: Flint OER - Response to May 2015 TTHM Sampling
Attachments: Flint-TTHM-OER-FINAL-4-01.pdf

Hi Mike,

On behalf of the City of Flint, attached is a PDF version of the latest Operational Evaluation Report required in response to the TTHM violation in May 2015. Hard copies will be sent out today.

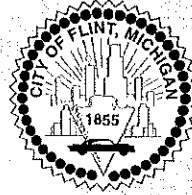
Jeffrey R. Hansen
Senior Project Manager



1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 C 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

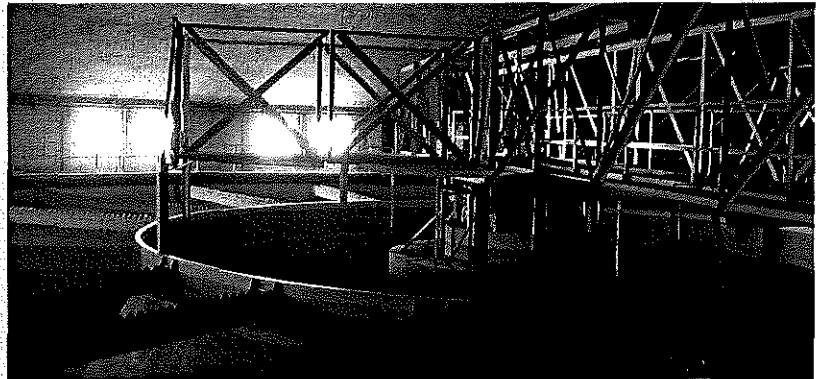
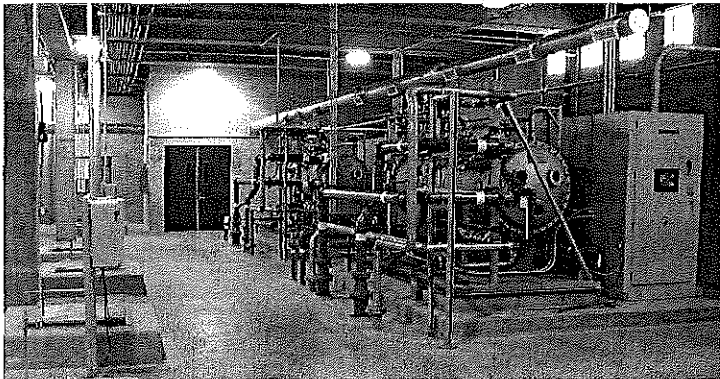
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Operational Evaluation Report City of Flint



Trihalomethane Formation Concern

August 27, 2015
In Response to May 2015 Sample Results



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

CITY OF FLINT
Operational Evaluation Report
 August 27, 2015



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CITY OF FLINT
Operational Evaluation Report
 August 27, 2015



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CITY OF FLINT
Operational Evaluation Report
August 27, 2015



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, six quarters of samples taken have resulted in annual average violations for total THM. Prior to the first violation (Nov. 2014), 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 six quarterly sampling cycles since Flint began operating the WTP full time, HAA5 levels have been acceptable but TTHM levels have exceeded the MCL. One sampling site was in violation following the May 2015 sampling cycle and results from August 2015 sampling indicate all sites are now within compliance.

A number of issues were identified as possibly contributing to the initial high THM levels measured.

1. Inefficient ozone system functionality which led to increased chlorine feed.
2. Upstream source influences in terms of increased chlorine demand.
3. Bypass stream around softening contributed to chlorine demand and increased total organic carbon (TOC) levels in the effluent.
4. Unlined cast iron pipes in the distribution system contributing to chlorine demand.
5. High water age in the distribution system due to:
 - a. Broken valves causing less than ideal flow patterns
 - b. Inefficient pump station pressure zones
 - c. Water storage volumes in excess of that needed for today's demands
 - d. Oversized water mains
 - e. Low water demands
6. High chlorine demand in filters.
7. High THM formation potential (THMFP) in source water.
8. Less than optimal removal of THM precursors.

A graphical representation of how the factors above relate to the timing of THM compliance sampling is shown as Table 1. Compliance sampling dates are hatched. Each row in Table 1 describes a factor that can lead to increased THM levels and the table defines when each of those factors applied. Note the convergence of nearly all factors around the second sampling period on August 21, 2014 to create what appears to have been a worst case scenario. The table also shows that the factors listed as those that the City can control have been addressed prior to 2015 sampling periods. Monthly operating report data up to August 1, 2015 is depicted on the Table.

TABLE 1 - SUMMARY OF NEGATIVE INFLUENCES ON THM COMPLIANCE SAMPLING

	FACTOR	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2014	Softening bypass stream over 20% of plant flow												
	Ozone system not feeding optimally												
	Using full water storage capacity of WSR & CSR												
	Chlorine feed at WTP 7.0 mg/l or more												
	Ferric chloride feed rate less than 10 mg/l Fe3+												
	Raw water temp 23 degrees C or more												
	Raw water TOC levels above 8.0 mg/l												
	Raw water coliform over 5000 counts/day												
	Positive bacteria test in dist. system (boil water notice)												
	Water demand less than 15 mgd												
2015	Softening bypass stream over 20% of plant flow												
	Ozone system not feeding optimally												
	Using full water storage capacity of WSR & CSR												
	Chlorine feed at WTP 7.0 mg/l or more												
	Ferric chloride feed rate less than 10 mg/l Fe3+												
	Raw water temp 23 degrees C or more												
	Raw water TOC levels above 8.0 mg/l												
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	Positive bacteria test in dist. system (boil water notice)												
	Water demand less than 15 mgd												

 Dates of occurrence
 Expected dates of occurrence based on past data
 Compliance sampling date

 Factors under Flint staff control

 Flint River characteristics

 System factors





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 is actively working to complete Stage 1 actions as soon as possible. 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. As of the date of this report, status updates for action items are shown in red.

Stage 1 – Immediate Actions

- Hire third party water quality expert to complete independent 'water audit'
 - The City hired Veolia Water to review all water quality related operations, procedures, actions taken and planned responses. Recommendations from Veolia were provided in a report and technical memo dated 3/12/15 and 3/30/15 respectively.
- Obtain an in house THM analyzer to allow regular operational monitoring of THM levels
 - THM analyzer was installed 2/17/15.
- Hire ozone system manufacturer to troubleshoot ozone system
 - Manufacturer and controls programmers performed on site evaluations followed by corrective modifications in January 2015.
- Bench scale jar testing
 - Match existing process and assess possible areas of improvement
 - Existing process was simulated and an evaluation of existing chemical feed dosages was completed by LAN.
 - Existing process TOC profile was developed by Veolia.
 - Simulate potential modifications to treatment process
 - Soda ash softening evaluation completed and PAC feed testing was completed by LAN.
 - Evaluate coagulation and flocculation polymer aid feeds to assist with TOC removal
 - Evaluations of polymer aids completed by LAN and PVS Technologies.
- WTP operational changes
 - Discontinue softening bypass stream to reduce chlorine demand
 - Operational directive has been set to soften no less than 80% of flow.
 - Disinfection of filter beds to reduce chlorine demand
 - Utility Service Group contracted by City and condition assessment completed. Controls improvements have been completed.
 - Begin coagulation and flocculation polymer aid feeds to assist with TOC removal if bench scale test results are positive
 - Jar testing completed to date has not indicated a meaningful benefit to feeding coagulation/flocculation polymer aids. Increased ferric doses have been implemented at the WTP based on positive jar test results.

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- Increase water main flushing efforts to minimize stagnant water
 - Flushing efforts are ongoing as needed based on chlorine residual levels measured in the system.
- Water system modeling to identify areas with high water age and potential solutions
 - The water model has been improved and preliminary results, including system wide water age, have been produced. Water demand updates and reconciliation with operator's data are underway with expected completion in mid June, 2015.
 - Cedar Street Pump Station potential recirculation
 - Water model analysis to be completed Sept-Oct, 2015.
 - West Side Pump Station potential recirculation
 - Water model analysis to be completed Sept-Oct, 2015.
 - Storage tank volume use
 - Operating levels of West Side and Cedar Street reservoirs have been lowered to reduce water age. Possible elimination of WS or CS to be evaluated Sept-Oct, 2015.
 - Possible broken closed valve locations
 - Model has been updated with known broken valve locations. Model results are being evaluated for indications of other possible broken valves. City has also initiated valve assessment program.
 - Locations in need of flushing
 - High water age areas have been identified in the water model. Further evaluation is expected to be done by November 1, 2015 to determine most effective flushing points.

Stage 2 – Contingent Actions

- Replace filter media with granular activated carbon (GAC) media
 - Filter anthracite media was replaced with GAC media July – August 2015.
- Fix ozone system
 - Repairs have been made to gauges and programming and the system is producing proper ozone and functioning under manual operation. Further minor repairs are planned for the 1st quarter 2015 to allow automatic operation.
- Start feeding coagulation and flocculation polymer aids to lower TOC, if not completed in Stage 1
 - Polymers evaluated by LAN did not demonstrate notable benefit.
 - PVS Technologies evaluated a proprietary polymer that showed little benefit.
- Convert to lime and soda ash softening
 - Option deemed unnecessary due to effectiveness of new GAC media.
- Change disinfectant to chloramine or chlorine dioxide until KWA
 - Option deemed unnecessary due to effectiveness of new GAC media.
- Install pre-oxidant feed (permanganate) at intake to optimize ozone disinfection
 - Option deemed unnecessary due to effectiveness of new GAC media.
- Implement advanced treatment for THM precursor removal
 - Option deemed unnecessary due to effectiveness of new GAC media.

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- Increased main flushing based on water modeling results
 - Water model analysis to be completed Sept-Oct, 2015.
- Continue valve replacements with water model assistance
 - Water model analysis to be completed Sept-Oct, 2015.
- Emphasize cast iron pipes on water main replacement priority list
 - Flint has bid replacement of over 2 miles of 24" steel pipe along Dupont and Bishop Streets to be completed when and if the City can allocate funds. The water main section is considered a critical transmission main, and is expected to contribute to decreases in water age when complete.

THM samples have been taken and tested 6 times for regulatory reporting since the City began using the Flint River for supply. Numerous additional sets of samples have been taken by the City for internal operational monitoring. Compliance samples were taken in May 2014, August 2014, November 2014, January 2015, February 2015, May 2015, and August 2015. The average of all eight sample sites in August 2014 was 142.1 ug/l and the most recent average of samples taken in August 2015 was 63.6 ug/l. The MCL defined by the EPA is 80 ug/l.

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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)

Prior to spring of 2014, 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 by 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 intended 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 VIOLATIONS

The EPA and MDEQ method of determining if TTHM sample results exceed the MCL uses a locational running annual average (LRAA). Flint's first TTHM violation was cited by the MDEQ following the third cycle of sampling completed in November 2014. Of the 8 sampling sites, 4 were in violation. At that time the MDEQ used the following calculation for determining if the MCL had been violated:

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

Flint has now completed tests for 6 quarters and a straight annual running average applies. Based on samples taken on August 18, 2015 there are no longer any sites in violation of the THM MCL limit. The August 2014 average across all test sites was 142.1 ug/l and the August 2015 average is 63.6 ug/l. Test results are tabulated in Table 2. HAA5 sample results are shown in Table 3, of which Flint has had no violations.

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TABLE 2 – TTHM TEST RESULTS (ug/L)

Sample Location	5/21/14	8/21/14	11/21/14	2/17/15	5/18/15	8/18/15	May/15 LRAA	Aug/15 LRAA
WTP Tap	56	86	33	-	~35	~25	n/a	n/a
1) 3719 Davison McDonalds	162.4	145.3	58.6	16.2	51.4	75.5	67.9	50.4
2) 822 S. Dort Hwy BP Gas Sta.	75.1	112.0	36.2	19.9	46.1	54.9	53.6	39.3
3) 3302 S. Dort Hwy Liquor Palace	111.6	127.2	33.3	16.8	63.5	53.2	60.2	41.7
4) 3606 Corunna Taco Bell	79.2	181.3	33.9	18.1	54.7	61.9	72.0	42.2
5) 2501 Flushing Univ. Market	106.4	196.2	93.6	24.5	59.8	70.6	93.5	62.1
6) 3216 MLK Salem Housing	82.2	112.4	50.1	28.5	72.7	90.3	65.9	60.4
7) 5018 Clio Rite Aid	88.2	144.4	53.6	19.2	60.5	59.5	69.4	48.2
8) 6204 N. Saginaw N. Flint Auto	96.5	118.3	41.1	14.9	45.2	42.6	54.9	36.0

TTHM MCL = 80 ug/l

TABLE 3 – HAA5 TEST RESULTS (ug/L)

Sample Location	5/21/14	8/21/14	11/21/14	2/17/15	5/18/15	8/18/15	May/15 LRAA	Aug/15 LRAA
WTP Tap	36 (taken June 14, 2014)						n/a	n/a
1) 3719 Davison McDonalds	64	43	16	9.0	16	15	21.0	14.0
2) 822 S. Dort Hwy BP Gas Sta.	38	40	21	9.0	16	11	21.5	14.3
3) 3302 S. Dort Hwy Liquor Palace	52	31	15	9.0	17	14	18.0	13.8
4) 3606 Corunna Taco Bell	50	24	15	9.0	16	13	16.0	13.3
5) 2501 Flushing Univ. Market	55	17	24	9.0	15	13	16.3	15.3
6) 3216 MLK Salem Housing	41	25	5	2.0	10	2	10.5	4.8
7) 5018 Clio Rite Aid	49	30	17	9.0	22	15	19.5	15.8
8) 6204 N. Saginaw N. Flint Auto	48	37	18	9.0	17	10	20.3	13.5

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

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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 4 – 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	N/A	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 when treating water from the Flint River. The improvements under the title of Phase II that have been completed or are nearly complete include installation of the future raw water feed connection point and valving for the KWA supply, 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, new oxygen / nitrogen storage facilities for the ozone system, 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 coagulant feed system
- Electrical
 - Pump Station #4 upgrades (under construction)
 - SCADA and controls upgrades
 - Filter transfer pump station feeders
- 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 in 2014 are shown in Table 5 below.

TABLE 5 – FLINT RIVER WATER QUALITY CHARACTERISTICS

Period	Turbidity NTU	TOC Mg/l	Alk. Mg/l	Hardness Mg/l as CaCO ₃	pH	Total Col. Count/day	THMFP Mg/l
2001 Apr–Oct	7.9	9.4	215	272	8.1	870-1230 (7300 max)	410
2014 May–Oct	8.3	10.3 5/22/14	207	252	8.2	1900-9000 (48,300 max)	187

The Flint River characteristics do not appear to have changed significantly over the past 10+ years. Note that near the time Flint initiated withdrawal from the Flint River 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

In development of the 2002 Treatability Study, processes were simulated which resulted in low THM levels. Therefore, information contained in that report was 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 is 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. Prior to recent repairs, readings indicated a production rate of approximately 700 lbs/day at 4% concentration. It is possible that before the recent improvements the ozone feed might not have been optimized. In fact, it is known that less than optimal ozonation previously led to increased chlorine feed which would have contributed to THM formation.

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 but are due for cleaning.

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. The east clarifier has an effluent weir imbalance that the City intends to fix when low demands allow for construction. Low lift pumping limitations, flow control to the basins, malfunctioning polymer feed pumps, control restrictions on residuals removal, 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. Lime and soda ash softening is a possible consideration to assist with TOC removal and thus reduce THM formation.



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. Sand and anthracite media was replaced in July and August 2015 with new sand and GAC at depths of 12" and 18" respectively. Prior to spring of 2014, the filters had 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 had developed in the filters leading to increased chlorine demand which could have contributed elevated TTHM. Late 2014, the City recently hired a contractor to upgrade the electrical controls for the filters and that work has been completed.

9. Disinfection

Disinfection is provided by ozonation and by feeding chlorine. Ozonation occurs at the front end of the WTP. Chlorine is 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 by late 2016 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, efforts for this study have concentrated 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 were the primary indicator of success or failure of 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 were sized based on various dimensionless factors to ensure the pilot treatment matched the actual system. Bench scale ozonation was not practical due to time and cost limitations. Therefore, water samples were withdrawn from the plant ozone basin effluent. These samples were transported to the laboratory and dispensed into square testing jars. The jars were used to simulate rapid mix, three-stage flocculation, and settling. Rapid mix and flocculation conditions were 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 was scaled to match the shorter settling depth of the testing jars. After settling, samples were decanted from the test jars. The decanted samples were then lime softened; softening conditions were similarly matched on the basis of "Gt". Carbon dioxide was sparged into the samples to reduce the pH. The water was then vacuum filtered through filter paper, sized to simulate the plant's dual media filters. The samples were dosed with excess chlorine and allowed to react for seven days at 25° C before testing for DBPs to determine the formation potential.

The following conditions were applied during testing to properly match small scale testing to actual plant processes.

TABLE 6 – BENCH SCALE TEST MIXING INTENSITIES

Process	G	Duration	Mix RPM
Ozonation	Plant	-	-
Rapid Mix	200	44 sec	160
Flocculation, Stage 1	50	9 min	55
Flocculation, Stage 1	25	9 min	30
Flocculation, Stage 1	12	9 min	19
Settling	N/A	10 min	-
Softening	TBD	10 min	-
Recarbonation	N/A	N/A	-

The primary variables during testing were chemical additions and chemical dosages. Specific chemicals and dosages used for initial testing conditions were selected to reflect current plant usage and the recommendations of the 2002 Treatability Study:

TABLE 7 – BENCH SCALE TEST CHEMICAL FEED RATES

Chemical	Current Usage	2002 Study	Test Values
Ozonation	4.66 mg/l	1.5 mg/l	
Ferric Chloride	7.7 mg/l Fe3+	40 mg/l Fe3+	7.7 – 80 mg/l Fe3+
Coagulant Aid Polymer	Not used	2.0 mg/l	1 – 2 mg/l
Flocculation Aid Polymer	Not used	0.05 mg/l	0 – 0.05 mg/l
Powdered Activated Carbon	Not used	N/A	20 – 100 mg/l
Lime	120 mg/l	175 mg/l	120 – 175 mg/l
Soda Ash	Not used	52 mg/l	0 – 52 mg/l
Cationic Softening Polymer	3.13 mg/l	Not used	3.13 mg/l
Anionic Softening Polymer	0.88 mg/l	Not used	0.88 mg/l
Fluoride	0.45 mg/l	1 mg/l	Not used
Carbon Dioxide	32 mg/l	37 mg/l	Fed to reach pH of 7.5 +/- 0.3
Chlorine	6.3 mg/l	1 mg/l	10 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) could be investigated as additional treatment measures.

4. LAN Test Results

Two rounds of jar testing were completed by LAN during the weeks of December 15, 2014 and January 26, 2015. Detailed test data is included in Appendix A. Testing results can be summarized as follows:

- Increased dosages of ferric chloride resulted in higher reduction of THMFP.
- The currently utilized feed rate of lime at 120 mg/l is appropriate
- Softening with soda ash in addition to lime resulted in minor additional THMFP reduction – in the range of 0% - 10%.
- The benefits of using a cationic polymer during softening at a dosage range of 0.31 - 3.13 mg/l to help reduce THM's are unclear
- The benefits of using an anionic polymer during softening at a dosage range of 0.09 – 0.88 mg/l to help reduce THM's are unclear
- Feeding PAC was ineffective in reducing THMFP within the dosage range of 20 – 100 mg/l.

5. Testing by Others

In addition to jar testing completed by LAN, the chemical supplier who provides ferric chloride for the City, PVS Technologies, ran tests using their recommended flocculant polymer aid. Plus, Veolia Water completed jars testing of their own the week of February 16th to analyze other process details and current WTP parameters. Experiments completed by PVS Technologies showed very little TOC removal beyond that obtained with straight ferric chloride feed.

6. Conclusions

Increasing the dose rate of ferric chloride is an operational change that can easily be implemented without the need for any additional equipment. Test results show that over 40% THMFP removal can be obtained with a dosage of 60 mg/l Fe³⁺ or higher. Increased dosing of ferric chloride would be most ideal coupled with regular raw water TOC monitoring so that TOC levels would dictate the appropriate ferric chloride feed rate.

Softening with soda ash in addition to lime is another option the City should consider if increased ferric chloride doses are not adequate to maintain THM levels under the MCL, particularly during warmer months. Again, monitoring of TOC in the raw water could provide useful information of when lime/soda ash softening is necessary.



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. Although the new source is one element in increased TTHM levels, value remains in evaluating the distribution system since water age is also a critical factor. Additionally, there may be distribution improvements that can be made to help alleviate the problem.

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. Based on discussions with City staff, the percentage of cast iron pipe may be higher than that stated in the MDEQ Sanitary Survey. 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 extent of contribution is not known but any water main replacement project will decrease chlorine demand somewhat if constructed properly. Unfortunately, water main breaks may also assist with decreasing water age by providing unintentional flushing. All things considered, it is impossible to quantify the impact existing piping has on THM formation without extensive research and long term study.

The City utilizes City Point software and GPS equipment to document main breaks and prioritize replacements. However, main break information is more pertinent to rusty water complaints and has little relevance to THM levels. Areas that have been targeted for main replacements include the transmission main from the WTP west to Dupont and south to the West Side reservoir, Fenton Road, Atherton Road, Dort Highway, Averil Street, and Boulevard Drive.

2. Storage

There are 4 finish water storage tanks and 1 raw water tank as tabulated below:

TABLE 8 – STORAGE TANKS							
Name	Type	Water	Volume (MG)	Operating		Absolute	
				LWL	HWL	Bottom	OF
Dort Reservoir	Ground	Raw	20	-	-	730	750
WTP Tank	Elevated	Finished	2	883.0	896.0	863.0	898.0
WTP Clear Well – PS #4	Ground	Finished	3	11'	15'	708.5	726.0
Cedar Street Reservoir	Ground	Finished	20	-	11'	737.2	757.2
Westside Reservoir	Ground	Finished	12	-	12'	761.8	779.0

The MDEQ typically recommends providing a minimum finish water storage volume of 1/3 the maximum daily demand (MDD). According to the 2013 MDEQ Sanitary Survey, the 5 and 10 year MDDs are 21.57 mgd and 30.05 mgd respectively. A common rule of thumb for clear well storage volume at a WTP is 10% of the design flow rate. Another general guideline for reliability is to provide total storage to allow for 2 X the average daily demand plus fire flow demand. For this analysis, fire flow is assumed to be 2,500 gpm for either one industrial fire (2,500 gpm) or a combination of one residential (1,000 gpm) and one commercial (1,500 gpm) fire at a 4 hour

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duration which results in a total volume of 600,000 gallons. These go-by approximations are summarized below with the applicable flow rates and are compared to the existing storage volumes currently being utilized.

<u>Common Practice</u>	<u>Flow Rate</u>	<u>Recommended Volume by ROT</u>	<u>Volume In Use</u>
Clear well 10% of Design Flow	18 MGD	1.8 MG	3.0 MG
Finish Storage = 1/3 MDD	30.05 MGD	10.0 MG	37 MG
Total Storage = 2 * ADD + FFD	13.87 MGD	28.3 MG	57 MG

Based on the values above, it appears the storage volume used in the Flint system could be decreased without negatively effecting reliability. The appropriate volumes of individual tanks will be further evaluated using the water system model and discussed in Section V (C).

All reservoirs have baffling to minimize stagnant water. Also, all tanks have been maintained and are in reasonable condition. The Westside reservoir has an exposed roof that is in need of rehabilitation, but its current condition has no influence on THM formation.

3. Pump Stations

All pump stations are in good condition but pumps are generally oversized. As an independent consideration, oversized pumps are not a contributing factor to high THM levels. Control of pumps and pressure zones are discussed in detail below.

B. OPERATIONS AND MAINTENANCE

1. Pump Station & Storage Operations

Pump stations and storage tank levels are controlled as shown in Table 9.

TABLE 9 – PUMP STATION CONTROLS

PS Name	Control Point	On Point	Off Point
PS No. 4 Raw	Operator	-	-
PS No. 4 Finish	Match plant flow	-	-
Westside	System pressure (elevated tank)	22.5'	33'
Cedar Street	System pressure (elevated tank)	22.5'	33'
Torrey Road	Distr. – Brown/Bradley	< 45 psi	> 45 psi

Prior to the first TTHM violation, Cedar Street and Westside pump stations were operated as needed and were alternated. Typically, Cedar Street was run in the morning and Westside was run in the evening and reservoirs for each were filled during low demand periods at night.

Westside, Cedar Street and Torrey Road pump stations are used to boost system pressure when high demands warrant it, but there are not well defined pressure zones within the system. Therefore, the possibility exists that water is being recirculated allowing for increased water age.



2. Booster Disinfection Practices

Booster disinfection is provided at the Cedar Street and Westside pump stations. When sustained residuals are not provided by chlorine feed at the WTP, sodium hypochlorite is applied at the reservoirs while being filled.

3. Changes in System Demands

Water demands in the City have been declining since the 1960's as the population has dropped. As a result, many of the water system components are oversized including storage tanks and water mains which both increase the time for water to reach the user.

From a short term perspective, Flint demands tend to increase in summer as is ordinarily expected but also in the winter due to water main breaks. The MDD for Flint often occurs in winter. Regarding THM formation, with lower temperatures and higher flows in the winter, THM levels taken at the distribution sample points are expected to be lowest for February sampling quarters than all others.

C. WATER SYSTEM HYDRAULIC MODELING

As part of this report, the City provided a hydraulic water model, originally developed by Potter Consulting, for LAN to update. Thus far, LAN has modified the model to be capable of extended period simulations, modified controls to reflect current operations, revised the piping to include known broken valve locations, updated pump curves, checked pipe diameters, updated system demands, and developed preliminary water age results throughout the entire system. Water age shown in the revised model corresponds for the most part to TTHM levels at the sampling sites. However, LAN has also identified several issues affecting the model that require further attention to allow for usable and reliable results. Those issues include accurate quantification of lost water and confirmation of the status of valves throughout the system. Preliminary water age results are presented in Table 10. Revised results will be provided when the hydraulic model has been fully updated.

TABLE 10 – PRELIMINARY WATER AGE FROM WATER MODEL

Sample Point	Location	Address	Water Age (Hrs)	May/15 LRAA THM (ug/l)
1	McDonalds	3719 Davison	25	68
2	BP Gas Station	822 S. Dort Hwy	18	54
3	Liquor Palace	3302 S. Dort Hwy	14	60
4	Taco Bell	3606 Corunna	340	72
5	Univ. Market	2501 Flushing	305	94
6	Salem Housing	3216 MLK	45	66
7	Rite Aid	5018 Clio	41	69
8	N. Flint Auto	6204 N. Saginaw	37	55

It is anticipated that topics shown below in italicized font will be detailed after the model is updated in Sept-Oct, 2015.

1. *Simulation of Existing System*

Match existing conditions. Chlorine and THM data may be used to verify model results. We have chlorine feed data at plant and residuals at 10 locations in each MOR, May 2014 – July 2015.



2. Identification of Water System Deficiencies

Specific issues to look at:

- Water age in entire system*
- Possible recirculating water through pump stations*
- Use of storage tanks – volumes in particular*
- 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, based on information provided by the City of Flint, the annual cost to receive water from the DWSD would be at least \$16,000,000/year or \$1,333,000/month. 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 daily raw water flow, pH, alkalinity, carbonate and non-carbonate hardness, chloride, temperature, turbidity and coliform count as part of standard preparation of Monthly Operating Reports (MOR). WTP staff have obtained and installed TOC and THM analyzers. The THM analyzer is set up as an on-line plant tap monitor and operations personnel have begun taking samples most days to track TOC levels throughout the treatment process. It is recommended to implement TOC tracking as a strict daily procedure which would provide staff the data needed to establish correlations to predict distribution system THM formation.

3. Intake Operations

The 2002 Treatability Study recommended pre-oxidation in the form of sodium permanganate as a feed at the intake. It is possible the addition of a pre-oxidant such as hydrogen peroxide or some type of permanganate could enhance the ozone process. Veolia evaluated permanganate demand during jar testing the week of February 16th, 2014 and recommended implementation at a dosage of 0.5 mg/l – 1.2 mg/l to achieve 10% additional TOC removal.

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 just lime 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. A temporary caustic soda feed system is recommended to be put in place in case the need for optimized softening arises.



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 in the past have signaled potential issues that the City was able to identify and remove.

An upstream monitoring and warning system could be established to attempt to detect water quality issues or spill event type contamination early enough to adjust treatment procedures or 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

- Increase ferric chloride dosage: Previous testing in the 2002 Treatability Study, jar testing completed by LAN, and a review of 2014 ferric chloride dosages compared to THM levels leaving the WTP support that increasing the ferric chloride dosage would help reduce THM formation.
- Increased monitoring: Currently, the MDEQ does not require daily reporting of raw water TOC or finished water TTHM levels. However, daily tracking of such levels would allow the City to develop a correlation between the two, thus providing a predictive tool to help manage TTHM levels.
- 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 but jar testing by LAN and PVS Technologies did not indicate clearly defined benefits. Addition of coagulation and flocculation polymer aids should be categorized as a future consideration that would require further evaluation.
- Discontinue softening bypass: In early summer of 2014 the City was 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. Veolia did not recommend this option after conducting jar tests.
- Disinfection of filter beds: Recommendation is no longer applicable since media has been replaced.
- 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.
- Discontinue or adjust softening anionic polymer feed: Some anionic polymers have been found to increase TOC. However, Veolia provided no recommendation to change polymers following their evaluation.



2. Infrastructure Change Recommendations

- Fix and/or replace faulty ozone equipment: Since the ozone equipment was installed it had not been used extensively on a full time basis. Following minor complications, the City hired the equipment manufacturer and a programmer to troubleshoot the system. Replacement of faulty gauges and redesign of the control program have allowed the system to operate properly since January 2015.
- Replace filter media with GAC media: GAC media could help reduce THM levels by reducing both TOC and chlorine demand. For this consideration, the intermediate chlorine feed location should be relocated to a point downstream of the filters. The City elected to pursue this option and 6 filters were completed in July 2015 and the remaining 6 were completed in August 2015. Provisions are also being considered for adding more GAC media and/or regeneration of media next summer.
- 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 or a form of permanganate as a pre-oxidant can enhance the activity of the ozone. Chemical feed could be installed at the intake structure or low service pump station, depending on the reaction time required. Use of a pre-oxidant at the intake might also provide the additional benefit of disinfection credit for ozonation with the MDEQ if an ozone residual can be obtained at the ozone process effluent as a result.
- Repair upstream sewer leak: a sewer leak upstream of the WTP intake was discovered in early summer 2014 and has been repaired by the City.

C. DISTRIBUTION SYSTEM

Potential distribution issues related to water quality issues discussed in Section IV included old cast iron pipe, oversized infrastructure, and remote storage/pump station locations and operations that might be less than ideal. Recommendations to address those issues are offered in this section.

1. Manage Water Age

a) Storage Tanks

Considering the excess storage capacity discussed in Section IV, in the short term it is recommended that operational changes be implemented immediately to reduce the overall volume of water stored to decrease water age. Immediate operational recommendations include lowering high water levels of reservoirs other than the elevated tank, to reduce the total system wide usable storage volume to 30-37 MG.

In the long term, LAN recommends development of the most ideal options for water model evaluation. Excess storage volume and tank locations within the water system afford Flint numerous options to reduce the amount of storage volume utilized. As a starting point, two recommendations are presented below.



Option 1

- Take West Side reservoir and pump station out of service
- Cut storage volume used in half at Cedar Street reservoir
- Adjusted system wide storage volume would be 35 MG

Option 2

- Take Cedar Street reservoir and pump station out of service
- Adjusted system wide storage volume would be 37 MG

b) Residence Time in Pipes

Completely redesigning and replacing the water system to match today's demands is not feasible financially and would be a waste of infrastructure with remaining useful life. Going forward, it is recommended that any future main replacement projects be evaluated for possible downsizing. When the water model is fully updated, it will provide a valuable tool in determining which mains can be downsized and to what extent. Replacement of broken valves and valve exercising are also recommended, which are programs that have already been implemented into Flint's regular operations.

Operationally, hydrant flushing is recommended as needed to minimize water age in low flow areas. Again, the updated water model should be used to locate high water age areas and optimal flushing points.

2. Reduce Disinfectant Demand

Recommendations to reduce disinfectant demand are similar to those described above to reduce water age. Replacement of old cast iron pipes would lead to a reduction of disinfectant demand on the distribution side, but realistically can only be accomplished over a prolonged period of time. In the meantime, hydrant flushing is the most viable means of reducing disinfectant demand in piping. From a storage standpoint, all reservoirs and tanks should be regularly inspected and maintained to prevent entrance of any outside contamination that would contribute to disinfectant demand. Cleaning of all tanks is recommended as well as investigation into stagnant water prevention options.

3. Water Modeling of Recommendations [yet to be completed]

Determine best flushing locations to reduce water age

Evaluate changes in storage tank operations 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

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 gage the effectiveness of existing feed point locations and dosages. Further discussion and details will be provided when the distribution evaluation results are available.



E. CATEGORIZATION OF ACTIONS

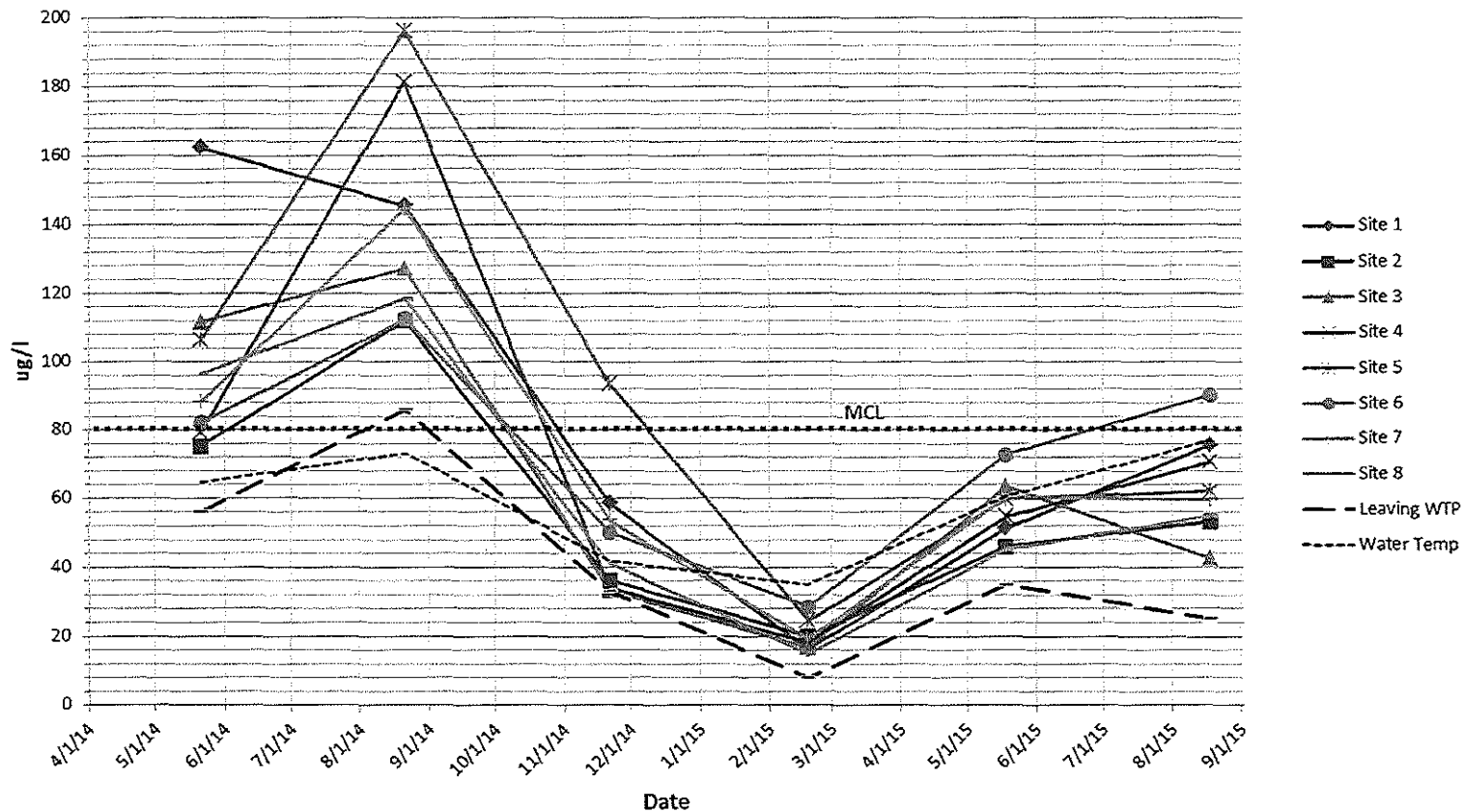
Considering that the Flint River is being used as the water source only until the KWA supply is available (expected late 2016), options to address high THM formation that require new construction or extensive time to implement are not preferred. On the other hand, the City understands THM sample results 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.

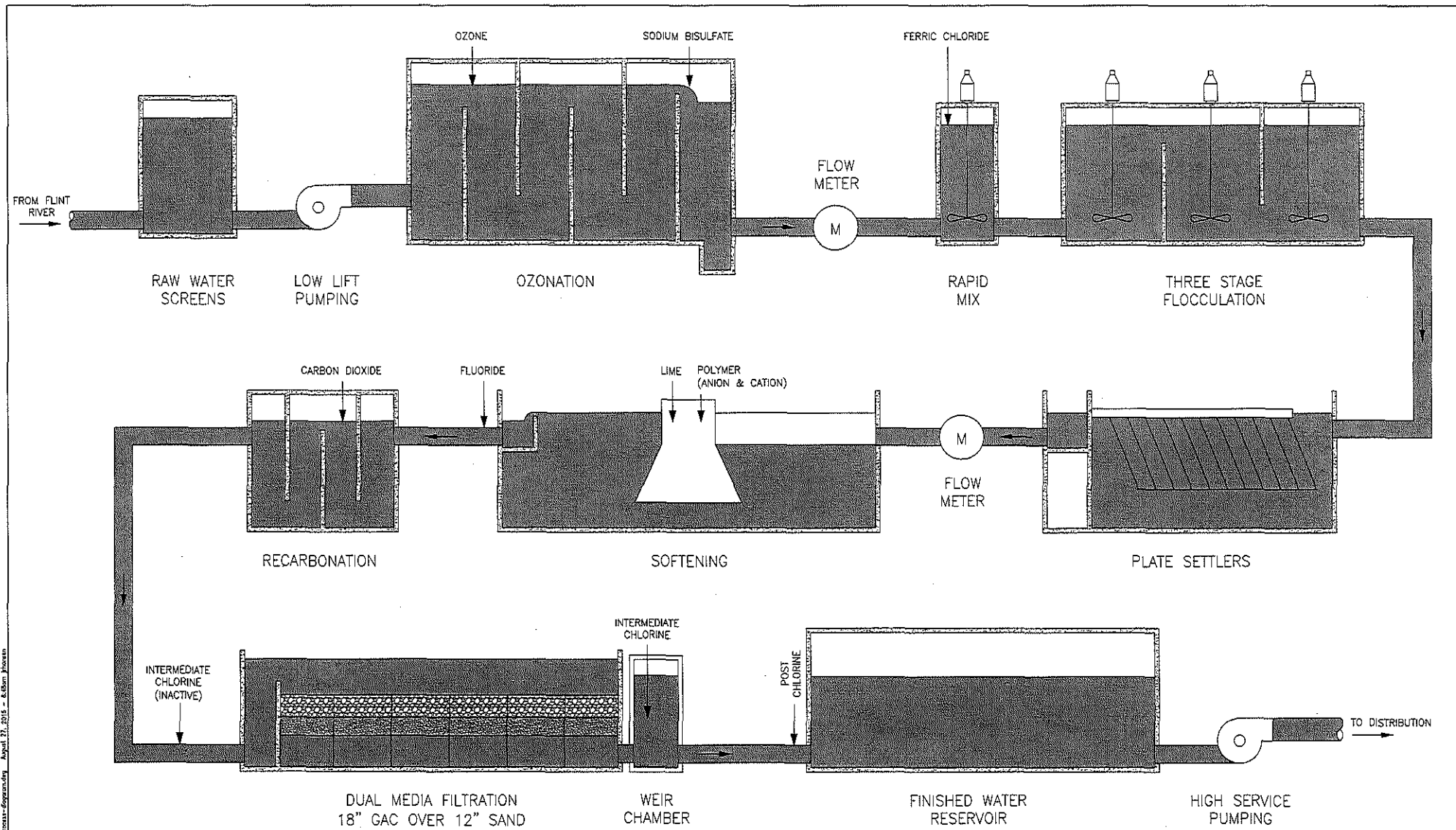
TABLE 11 – ACTION PLAN			
	Action	Purpose	Status
Stage 1	Hire water consultant to complete 'water audit'	Third party review of actions and operations to make sure no options are being missed	Complete
	Increased water quality monitoring – obtain THM and TOC analyzers	Provide information needed to adjust WTP operations to match changing raw water quality	Complete
	Troubleshoot ozone feed system	Reduce chlorine feed and increase TOC removal	Complete
	Bench scale jar testing	Optimize treatment process and evaluate possible modifications	Complete
	Discontinue softening bypass	Reduce chlorine demand	Complete
	Disinfect filters	Reduce chlorine demand	Complete
	Increased water main flushing	Reduce water age / stagnant water	Ongoing
	Water system modeling evaluation	Determine areas with high water age and reasons	Partially complete
Stage 2	Modify booster disinfection feeds, if appropriate	Decrease water age	Not yet evaluated
	Repair ozone system	Reduce chlorine feed and increase TOC removal	Complete
	Continue increased water main flushing	Reduce water age / stagnant water	Ongoing
	Replace filter media with GAC	Reduce TOC and chlorine demand	Complete
	Continue valve replacements based on water model	Reduce water age / stagnant water	Ongoing
	Convert to lime and soda ash softening	Increase TOC removal	Future consideration
	Change disinfectant to chlorine dioxide	Reduce THMFP	Future consideration
	Install pre-oxidant feed at intake	Optimize ozone disinfection, reduce chlorine	Future consideration
	Implement coag. & floc. polymer aids, if appropriate	Increase TOC removal	Future consideration
	Place priority on replacing cast iron water mains	Reduce chlorine demand	Ongoing

Samples were taken August 18th, 2015 for the latest round of quarterly testing. The City has implemented many of the Stage 1 actions and installed GAC media in the filters and THM test results have significantly improved (decreased) since May and August 2014. All sampling results are shown on Chart 1.



CHART 1
THM Sampling Test Results





Genesee County

Lockwood, Andrews & Newman, Inc.
 1211 S. Linden Road, Suite B
 Tel: 810-420-2682 Fax: 810-420-2703
 www.lan-inc.com

**CITY OF FLINT
 WATER TREATMENT PLANT**

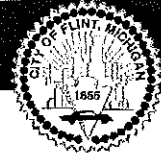
REVISIONS			FILE LOG	
NO.	DESCRIPTION	DATE	BY	CHK

**WATER TREATMENT PLANT
 PROCESS DIAGRAM**

Project No. 130-10701-001
 Date Aug. 27, 2015

Sheet
FIG 1

CITY OF FLINT
Operational Evaluation Report



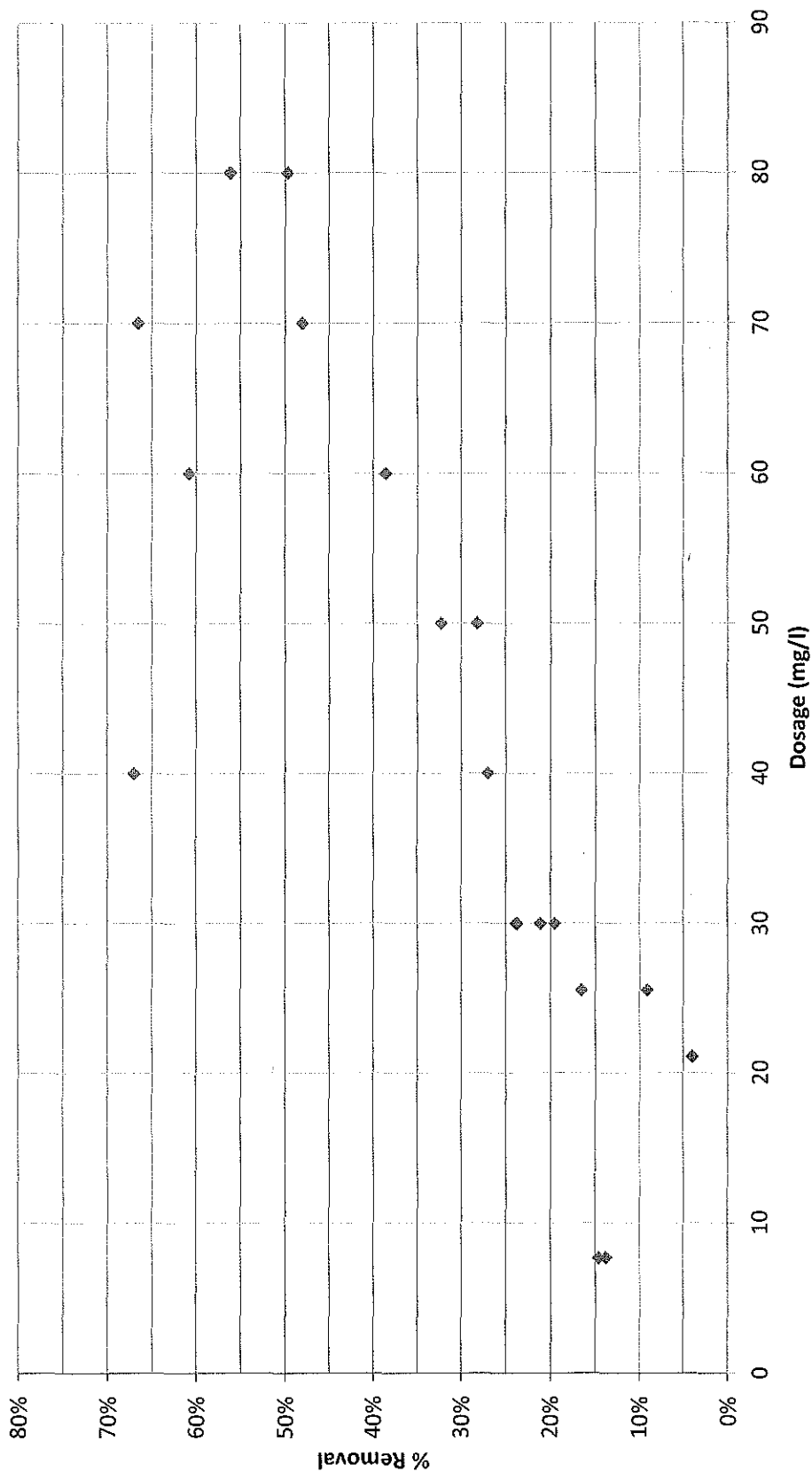
APPENDIX A

JAR TEST DATA



Ferric Chloride Feed THM Removal

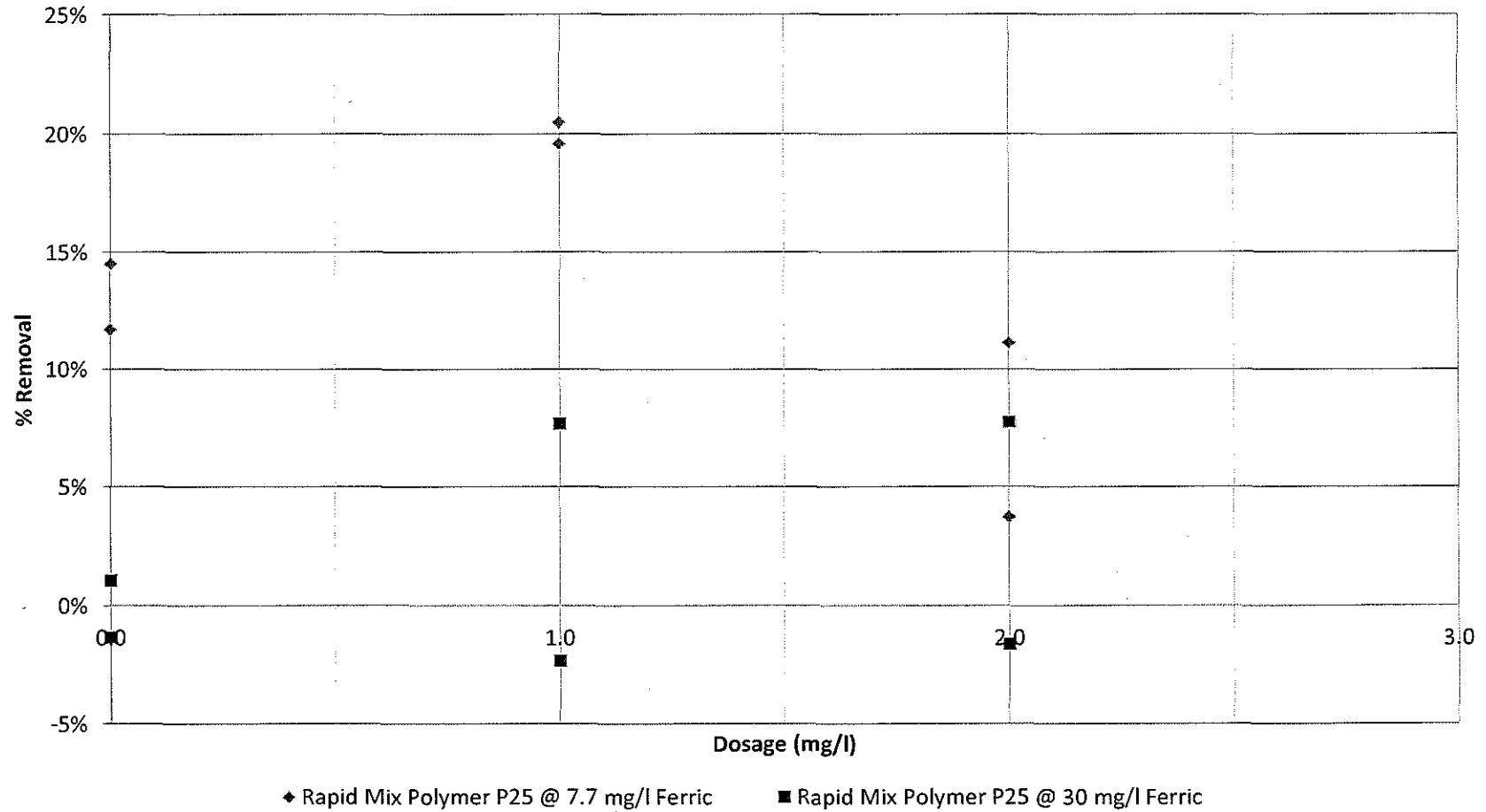
Charles F. Lawrence, P.E.





Charles F. Lawrence, P.E.

Coag/Floc Polymer Aid THM Removal



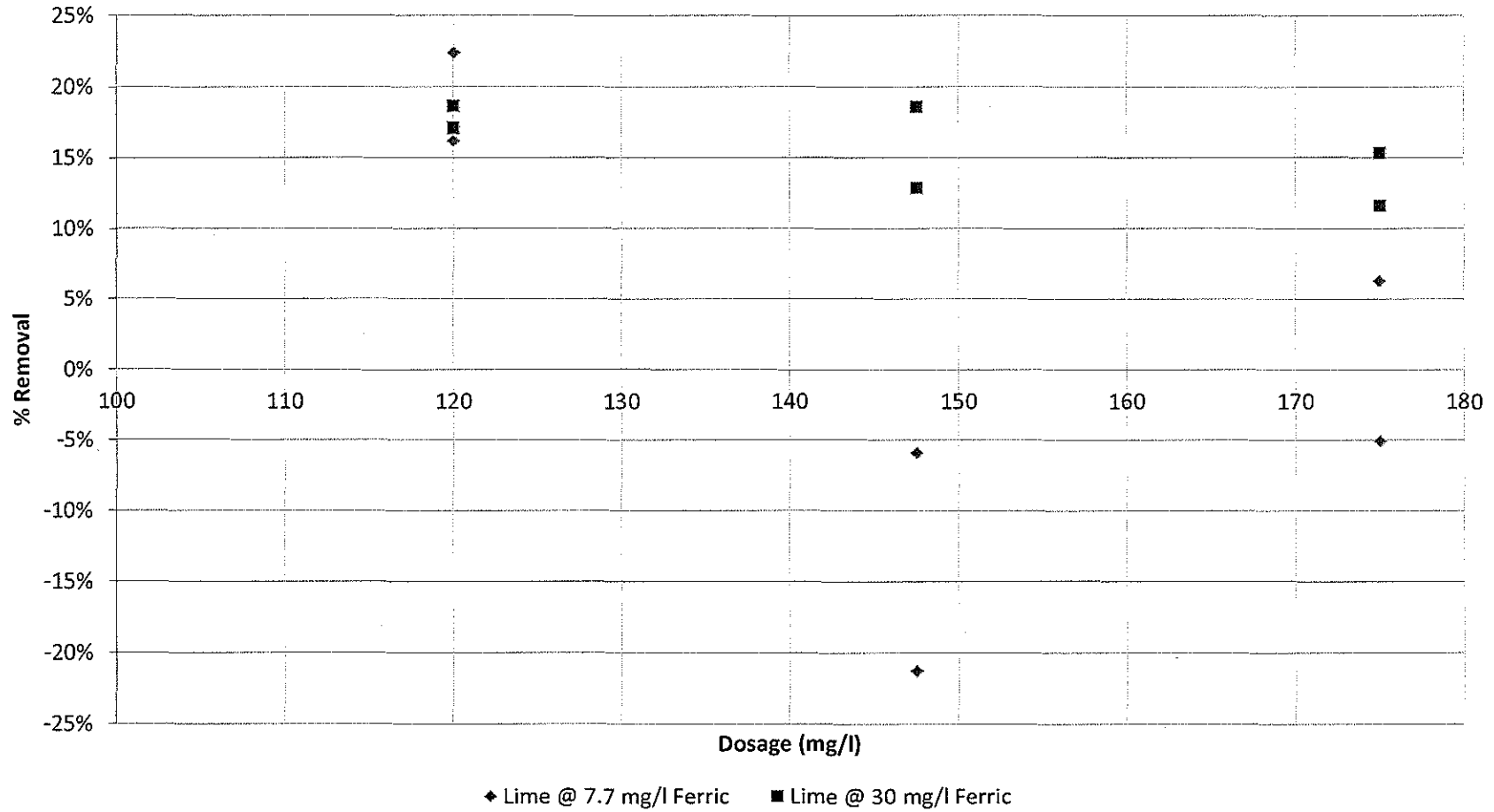


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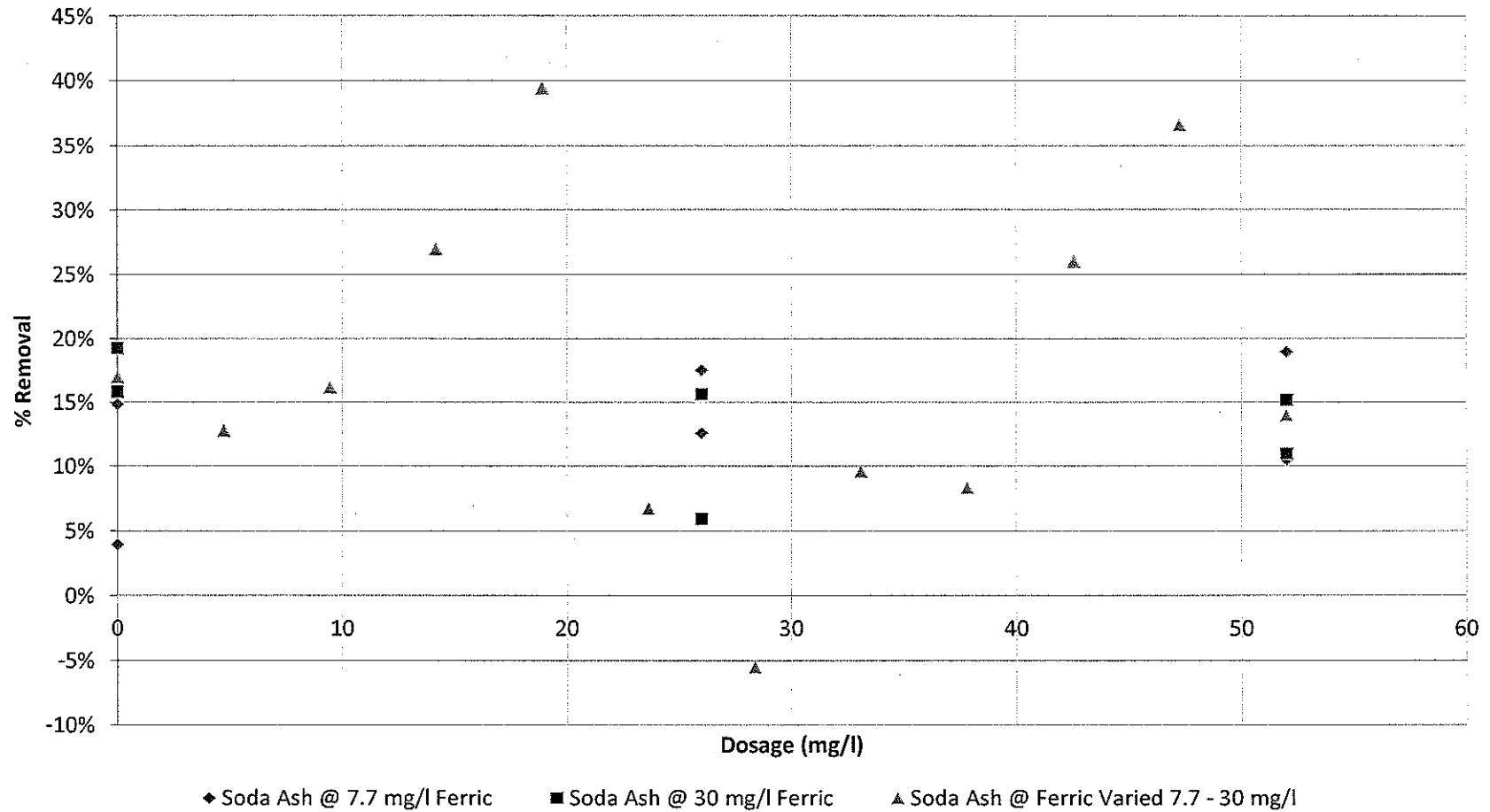
Lime Feed THM Removal

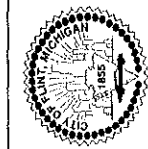




Charles F. Lawrence, P.E.

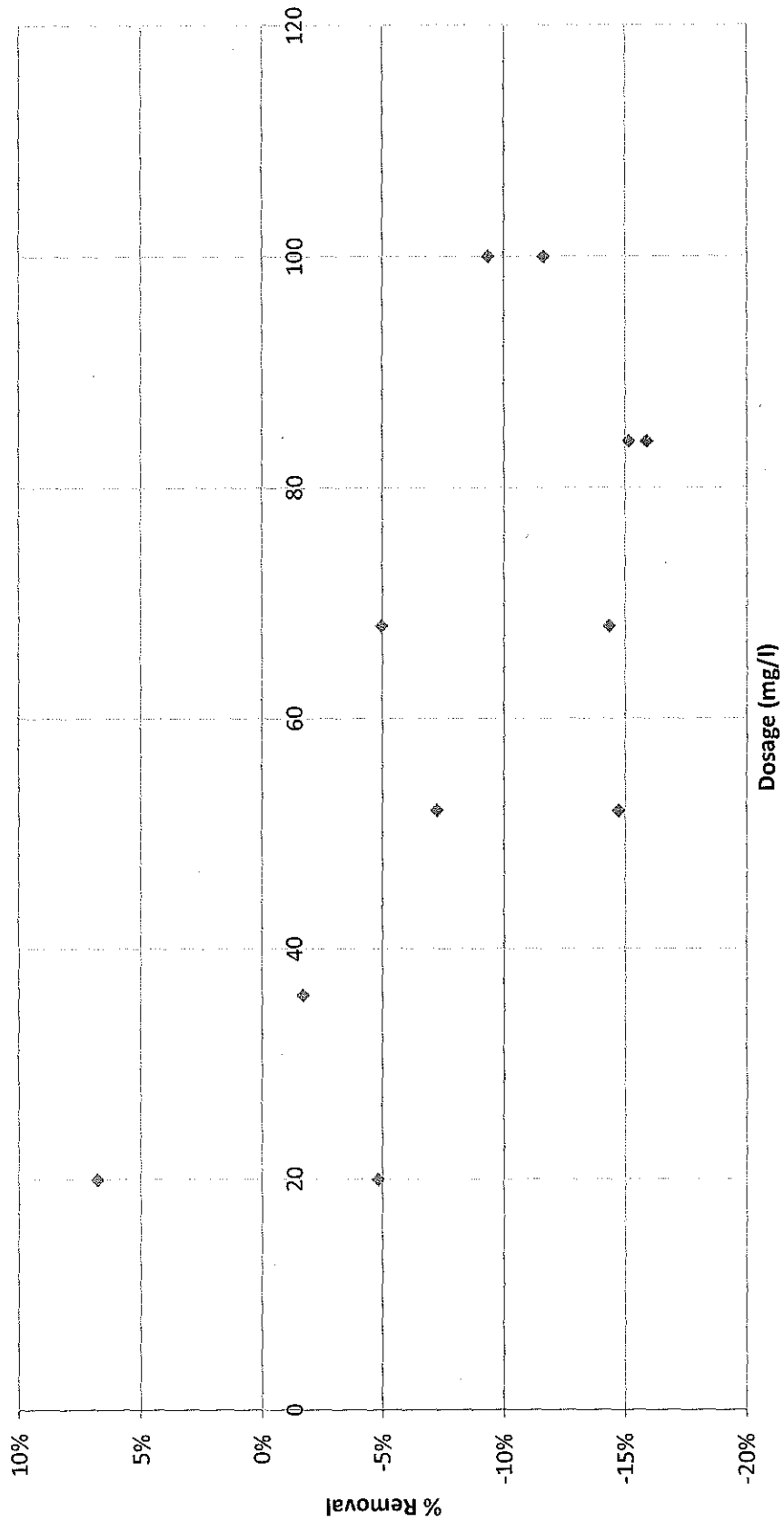
Soda Ash Feed THM Removal





PAC Feed THM Removal

Charles F. Lawrence, P.E.



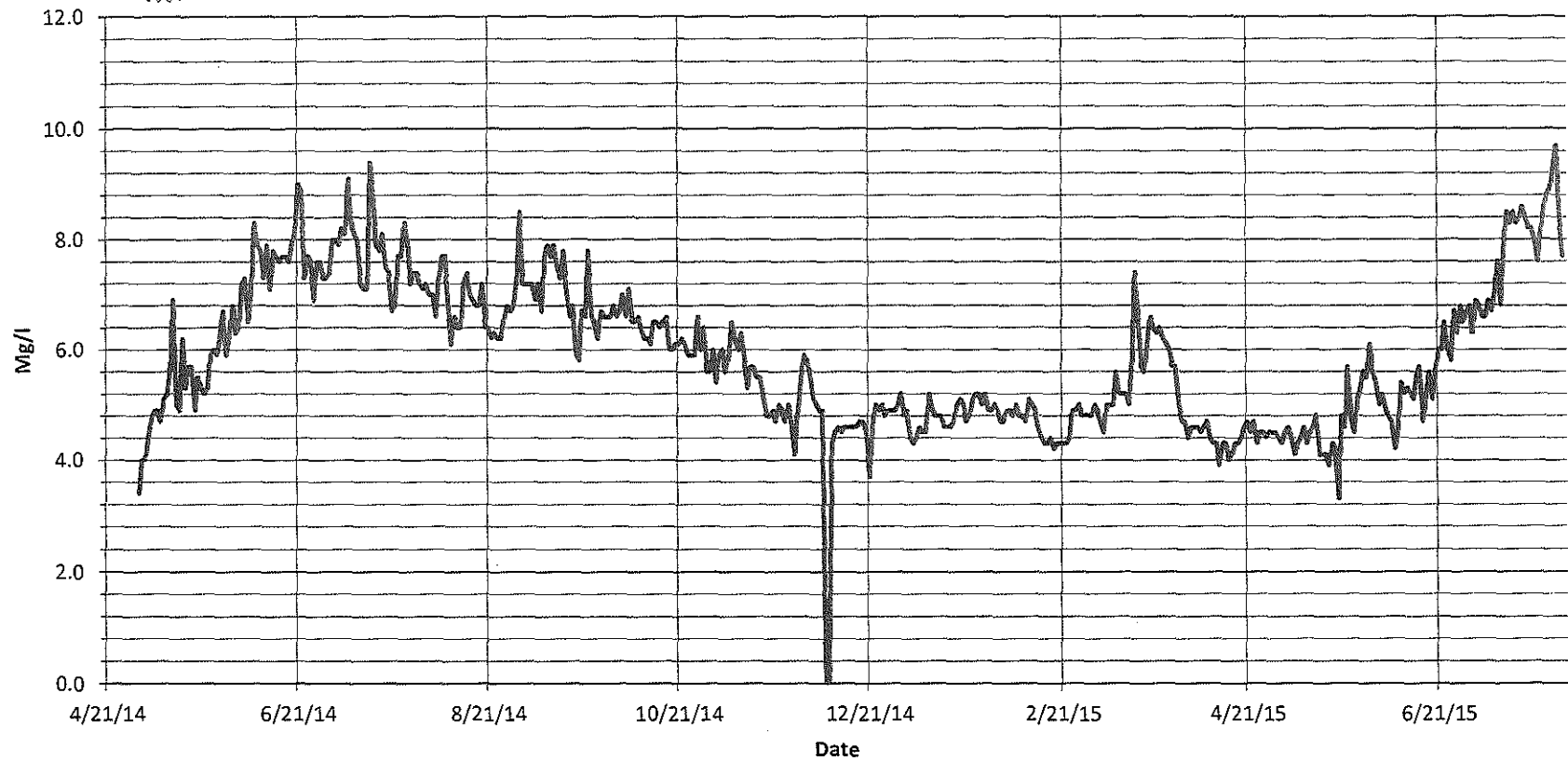
CITY OF FLINT
Operational Evaluation Report



APPENDIX B
WTP DATA



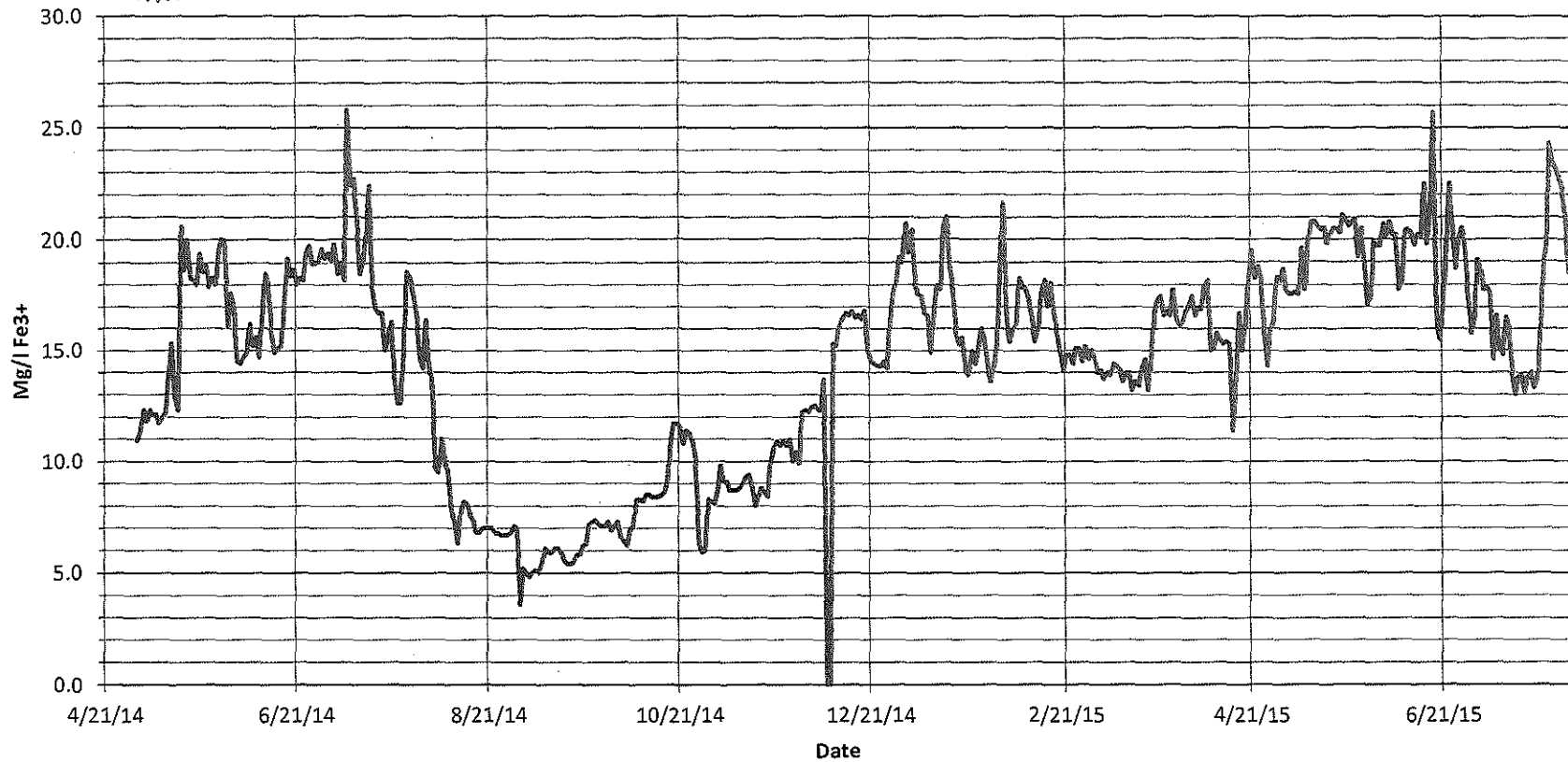
Chlorine Feed





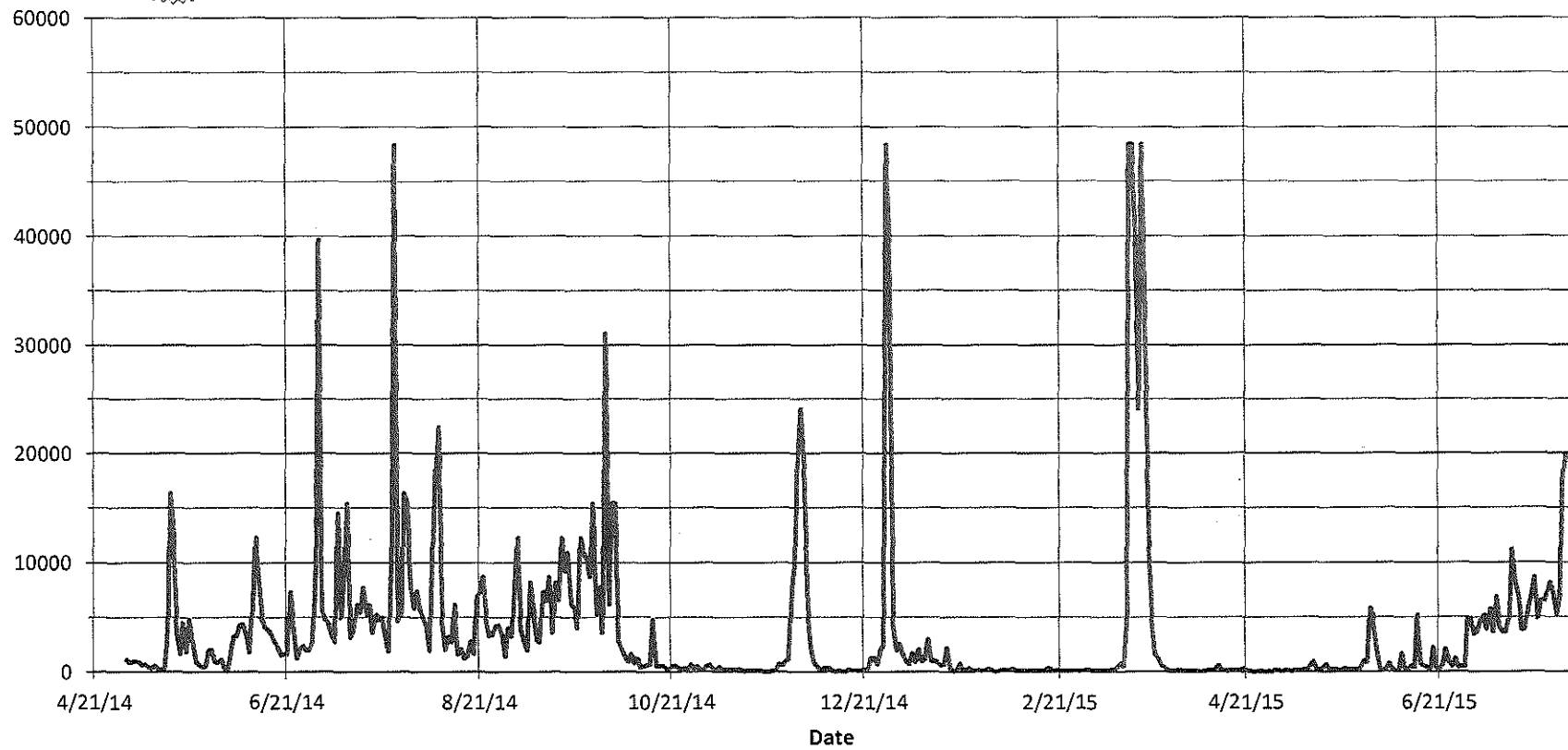
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Ferric Chloride Dosage





Raw Water Coliform Count



Operational Evaluation Report Trihalomethane Formation Concern

Headquarters

2925 Briarpark Drive
Suite 400
Houston, TX 77042
713.266.6900

info@lan-inc.com

Texas

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**Lockwood, Andrews
& Newnam, Inc.**
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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 31, 2015 2:29 PM
To: Busch, Stephen (DEQ)
Subject: Flint TTHM draft letter, Fenton Sanitary Survey - draft letter
Attachments: Flint DBP 3Q15.doc; Evalltr 2015.doc

Steve,

Attached are draft letters for you review and comment as needed. City of Flint – Return to Compliance, City of Fenton – Sanitary Survey. Thanks.

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

August 31, 2015

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Total Trihalomethanes (TTHM) Return to Compliance
 3rd Quarter 2015 Monitoring Period

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

In accordance with R 325.10610, *MCLs*, of the 1979 Administrative Code, the MCL for disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City's highest TTHM LRAA, based on the last four quarters, ending August 31, 2015, is 0.062 mg/L which meets the standard. All eight sample site locations meet the LRAA standard of 0.08 mg/l.

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. The return to compliance began on August 31, 2015, and will continue as long as the TTHM LRAA remain below the MCL at all sample sites.

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

Mr. Brent Wright

2

August 31, 2015

We are pleased with the corrective measures that the city has taken, including the installation of granular activated carbon (GAC) at the water treatment plant (WTP) as recommended in the Operational Evaluation Reports. Installation of the GAC played a major role in reducing the TTHM LRAA below 0.080 mg/L at all eight locations. We encourage the city to continue to implement corrective measures discussed in Operational Evaluation Reports from December 2014, February 2015, and May 2015 as a means to maintain compliance with the TTHM standard.

Further, the TTHM operational evaluation level (OEL) calculated in accordance with R 325.107191, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, remained below the 0.080 mg/L OEL trigger at all eight sample site locations. Since the OEL has been met for a second consecutive quarter and that the peak month for TTHM levels was met, the city will not be required to provide our office with an updated OEL Report.

The city may proceed with providing a public notice (PN) to their customers of the return to compliance. While the city meets the LRAA at all eight sites, the individual TTHM concentration exceeded 0.08 mg/l at one location (0.09 mg/l at DBP 7 – Salem Housing 3216 MLK Boulevard) during the August 2015 sampling event. Although this individual result does not cause an exceedance of the LRAA at this site, the city encouraged to include discussion of this result in their return to compliance notification to city residents.

We encourage the city to utilize the same routes of notification, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. The City is also encouraged to include additional information regarding its response efforts that resulted in the return to compliance. **Please send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the PN.** Finally, as a reminder, the TTHM violation must also be included in your 2015 Consumer Confidence Report, due by July 1, 2016.

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

Sincerely,

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

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

Mr. Brent Wright

3

August 31, 2015

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

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Has Returned to Compliance

Our water system recently returned to compliance for total trihalomethanes. As our customers, we will inform you as to the corrective measures that were taken to return to compliance.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (November 20 of 2014 and February 17 & May 18 & August 18 of 2015). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the MCL. The standard for TTHMs is 80 micro grams per liter ($\mu\text{g/L}$). The location reporting the highest TTHM level was 62 $\mu\text{g/L}$; thus, our water system has returned to compliance with the TTHM MCL.

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

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

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

CERTIFICATION:

WSSN: 02310

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

Signature

Title

Date Distributed

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

August 31, 2015

Mr. Dan Czarnecki, Public Works Director
 City of Fenton
 301 South Leroy Street
 Fenton, Michigan 48430

WSSN: 2270

Dear Mr. Czarnecki:

SUBJECT: 2015 Sanitary Survey; City of Fenton Water System

This letter confirms my visits with Mr. Steve Guy, Water Plant Superintendent, on April 27, 2015 and May 28, 2015 and with you on May 20, 2015.

Below is a summary of the subsequent review and discussion of the water supply facilities serving the City of Fenton (Fenton) water system. The purpose of the meetings was to evaluate the water system with respect to the requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399) and the Administrative Rules adopted from Act 399. In addition, the enclosed Water System Sanitary Survey was updated to gather information on the Fenton water system.

Our updated survey visit confirms that Fenton completed rehabilitation of Well #5. The work included overhauling the pump and motor, chemical cleaning of the well screen, and replacement of the drop pipe. A variable frequency drive controller was also installed. Based upon the pump installation report, Well #5's original capacity has been restored. This work demonstrates Fenton's commitment towards maintaining investment in its groundwater source. We encourage Fenton to maintain a proactive well maintenance program on all four production wells. The next wells due for routine maintenance in the next one to two years include Wells #7 and #8.

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

Survey Element	Findings
Source	Recommendations made
Treatment	Recommendations made
Distribution System	Recommendations made
Finished Water Storage	Recommendations made
Pumps (All dist. Pumping)	Recommendations made
Monitoring & Reporting	Recommendations made
Management & Operations	Deficiency Identified
Operator Compliance	No Deficiencies/Recommendations
Security	No Deficiencies/Recommendations
Financial	Recommendation made
Other	Not applicable

The following deficiency is a violation of Act 399 and must be resolved in order to return the water system to compliance.

R 325.11203 of the Administrative Rules of Act 399 requires Type-I public water supplies to conduct a water system Reliability Study (RS). The RS shall also be updated every five years unless waived by our department. The city has been requested to update their most recent RS (2005 Drinking Water Revolving Loan Project Plan) on several occasions and it is our understanding that an updated RS is being prepared and a draft copy will be provided to us for review and comment. Fenton will re-achieve compliance with R 325.11203 following our review and approval of the updated RS.

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

1. Re-implement Fenton's Wellhead Protection Program (WHPP). Fenton's WHPP approval status expired on January 2, 2015. Given the resources and effort put forth to establish the program, we encourage Fenton to re-establish the program and maintain all WHPP activities. For further information and/or assistance in re-implementing the WHPP, please contact Mr. Jason Berndt from our Community Drinking Water Unit at (989) 705-3420.
2. Install meters in the remaining un-metered governmental buildings in the downtown area. A fully metered system will help to further refine future un-accounted water use (loss) determination.

We also recommend that Fenton upgrade their metering system to a radio-read system. A full radio read system is a significant water system improvement, as it significantly reduces the time needed to conduct routine meter reads and allows water utility operators to focus on other O&M programs. Radio read also enhances leak detection and improves customer service by providing the water utility the ability to inform customers of un-noticed leaks before they cause a problem.

3. Operate the stand-by power generators under load for each production well on a yearly basis to confirm proper operation of all the electrical components. This practice also helps water utility operators remain familiar with the procedures in switching to and from stand-by power generation.
4. Pursue full lightning surge protection for the main pumping components at the water treatment plant (WTP). This provision will increase the operating reliability of the WTP, help avoid costly repair to the electrical components, and minimize disruption of routine treatment plant operation.
5. Repair or replace the aeration unit's air-intake screens. These screens are essential in preventing insects and other foreign objects from entering the aerator unit. Routine inspection of the intake screens and repair/replacement on an "as-needed" basis is essential in maintaining the sanitary integrity of the aeration system.
6. Deterioration of the treatment plant's solids contact unit epoxy coating system was noted. Replacement of the epoxy coating system on each contact clarifier is recommended within the next one to two years. The new epoxy coating system must be

an approved product under ANSI/NSF Standard 61 suitable for contact with potable water.

7. Continue to work towards expanding the WTP filter maintenance program to include a broad scope of filter investigation techniques. This should include;

- General filter inspections
- Review of water quality and operational information
- Filter media expansion measurements
- Gravel mounding measurements
- Free board to media measurements
- Box excavations (media profile)
- Core sampling and media examination

WTP operators continue to gain operating experience and knowledge unique to this facility. Further filter preventative maintenance activities will continue to increase their familiarity with overall treatment plant maintenance. Finally, filter media cleaning (recommended by Utility Services) should also be completed.

8. Inspect filter gullets and clearwell as individual treatment trains are taken out of service as part of routine operation. Any cracks that are discovered should be properly repaired. A more comprehensive inspection of the clearwell should be completed within the next one to two years.
9. Adjust the treatment plant's fluoride (FL) dosage to meet the lower optimal FL concentration in drinking water to 0.7 parts per million (ppm) recently established by the Department of Health and Human Services. Fenton's raw water FL concentration over the past 12 months is 0.24 ppm; thus, FL should be dosed between 0.45 and 0.5 ppm to achieve the optimal concentration.
10. Sodium Hexametaphosphate and Orthophosphate are added for filter aid and corrosion control respectively; however, Page 5 of the monthly operation report (MOR) reports total phosphate (PO₄) applied in pounds and milligrams per liter (mg/l). Both compounds; however, need to be reported separately in the MOR. Also, the total phosphate concentration in mg/l (plant tap and distribution) needs to be monitored and reported in the MOR. Total phosphate should be monitored on a weekly basis at the plant tap and from several distribution system locations in conjunction with total coliform monitoring.
11. Recoat the exterior portion of both ground storage tanks and repair the roof hatch hinge based on Utility Service's recommendations. Also, the tank site should be visited on a

Mr. Dan Czarnecki

4

August 31, 2015

weekly basis in which tank appurtenances (vents and overflows) and any indication of vandalism are checked.

12. Provide stand-by power and upgrade telemetry control at the Adelaide Road pump station to improve the level of water service for residents in the Jane Hill Subdivision.
13. Establish a more comprehensive valve operation program. An active valve program helps to keep valves in good operating condition, reduces interruptions in service during emergency repairs, and reduces water loss and property damage. Given the number of isolation valves in the water distribution system, we recommend establishing a segmented approach (prioritize valve turning by quadrants). This methodology has worked well for other water utilities and allows most isolation valves to be operated over a four to five year period. Fenton is encouraged to implement this approach as a means to expand their valve program.
14. Update Fenton's most recent (2008) water system General Plan (GP) by January 1, 2016. The updated GP needs to include the following information in accordance to the revisions in the Michigan Safe Drinking Water Act's Rules.
 - General layout of the entire waterworks system, including distribution system piping and the location of valves, hydrants, storage tanks, and master meter connections.
 - A hydraulic analysis of the distribution system showing pressure contours under peak demands and inventory of watermain by size, material, and age. The hydraulic model used in the updated RS can be used for the GP. The hydraulic model needs to reflect the water distribution system's current configuration and include the most recent improvements.
 - Service area map including existing and future service area boundaries.
 - Water System Capital Improvement Program (WSCIP) for the 5-year and 20-year planning periods. The WSCIP should be based upon recommended improvements that are presented in the updated RS.

Since both the RS and the GP need to be completed within the next six months and they contain overlapping elements, it may be worthwhile to update them concurrently.

15. Update the 2010 Bacteriological Sampling Site Plan. The updated plan needs to reflect changes in system contacts (local and DEQ). A bacteriological sampling site plan template was provided to the water utility and can be used for preparing an updated plan. A copy of the updated sampling site plan needs to be provided to the Department of Environmental Quality (DEQ) for review and approval.

Please submit a letter by September 30, 2015, that outlines Fenton's plans and schedule to address the above items.

If you have any questions, feel free to contact me at (517) 290-8817; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 1st Floor South, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 31, 2015 1:44 PM
To: Hansen, Jeff
Subject: RE: Flint THM

Jeff,

The table you sent me, prepared by the city, is not correct. We will send you a copy of the table with the addresses that correspond to the correct site codes.

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: Monday, August 31, 2015 1:33 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint THM

Mike,

I received the attached info from the City. I wanted to confirm the right numbers are lined up with the right sample sites since we had problems with that before and also because I thought you told me Salem Housing was the highest location at site 7. However, we have Salem housing as site 6.

Please let me know if the attached table is correct compared to your records.

Jeffrey R. Hansen
 Senior Project Manager



1311 South Linden Road, Suite B • Flint, MI 48532
 T 810.820.2682 C 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

From: Prysby, Mike (DEQ) [<mailto:PRYSBYM@michigan.gov>]
Sent: Monday, August 31, 2015 9:05 AM
To: Hansen, Jeff
Subject: RE: Flint THM

Jeff,

Just tried to call you...please call me at your earliest convenience.

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: Monday, August 31, 2015 8:44 AM
To: Prysby, Mike (DEQ)
Subject: RE: Flint THM

Hi Mike,

Still nothing?

Jeffrey R. Hansen
Senior Project Manager

From: Prysby, Mike (DEQ) [<mailto:PRYSBYM@michigan.gov>]
Sent: Thursday, August 27, 2015 9:27 AM
To: Hansen, Jeff
Cc: Rosenthal, Adam (DEQ)
Subject: Re: Flint THM

Not yet....I will check with Adam Rosenthal, our EQA, when I return from to office this afternoon.

Sent from my iPhone

On Aug 27, 2015, at 8:19 AM, Hansen, Jeff <jrhansen@lan-inc.com> wrote:

Hi Mike,

Have you seen any results from the DEQ lab for Flint TTHM yet?

Jeffrey R. Hansen
Senior Project Manager

<image001.gif>

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 31, 2015 1:42 PM
To: Rosenthal, Adam (DEQ)
Subject: RE: Flint THM

That's what I thought.... I will let Jeff Hansen know....and will send him a copy of our table.

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

From: Rosenthal, Adam (DEQ)
Sent: Monday, August 31, 2015 1:41 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint THM

yes, the codes they put on the samples don't match their plan, what we have in SDWIS, and they aren't even consistent in the errors from quarter to quarter.

From: Prysby, Mike (DEQ)
Sent: Monday, August 31, 2015 1:36 PM
To: Rosenthal, Adam (DEQ)
Subject: FW: Flint THM

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<image001.gif>

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	No.	Address	Sample Location	5/21/14	8/21/14	11/21/14	2/18/15	5/18/15	8/18/15	Feb	May	Aug
										LRAA	LRAA	LRAA
TTHM	1	3719 Davison	McDonalds	162.4	145.3	58.6	16.2	51.4	75.5	95.6	67.9	50.4
	2	822 S. Dort	BP Gas Sta.	75.1	112	36.2	19.9	46.1	53.2	60.8	53.6	38.9
	3	3302 S. Dort	Liquor Palace	111.6	127.2	33.3	16.8	63.5	42.6	72.2	60.2	39.1
	4	3606 Corunna	Taco Bell	79.2	181.3	33.9	18.1	54.7	70.6	78.1	72.0	44.3
	5	2501 Flushing	Univ. Market	106.4	196.2	93.6	24.5	59.8	61.9	105.2	93.5	60.0
	6	3216 MLK	Salem Housing	82.2	112.4	50.1	28.5	72.7	59.5	68.3	65.9	52.7
	7	5018 Clio	Rite Aid	88.2	144.4	53.6	19.2	60.5	90.3	76.4	69.4	55.9
	8	6204 N. Saginaw	N. Flint Auto	96.5	118.3	41.1	14.9	45.2	54.9	67.7	54.9	39.0

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	3	3302 S. Dort	Liquor Palace	111.6	127.2	33.3	16.8	63.5	42.6	72.2	60.2	39.1
	4	3606 Corunna	Taco Bell	79.2	181.3	33.9	18.1	54.7	70.6	78.1	72.0	44.3
	5	2501 Flushing	Univ. Market	106.4	196.2	93.6	24.5	59.8	61.9	105.2	93.5	60.0
	6	3216 MLK	Salem Housing	82.2	112.4	50.1	28.5	72.7	59.5	68.3	65.9	52.7
	7	5018 Clio	Rite Aid	88.2	144.4	53.6	19.2	60.5	90.3	76.4	69.4	55.9
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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, August 31, 2015 11:55 AM
To: Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ)
Cc: Benzie, Richard (DEQ)
Subject: RE: Flint

Mike spoke with some staff from Flint earlier today. They are still having internal discussions regarding corrosion control treatment.

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

From: Shekter Smith, Liane (DEQ)
Sent: Friday, August 28, 2015 3:33 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Benzie, Richard (DEQ)
Subject: FW: Flint

Any word?

From: Poy, Thomas [<mailto:poy.thomas@epa.gov>]
Sent: Friday, August 28, 2015 3:29 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint

Liane/Richard: Has Flint replied yet on how they plan to comply with the corrosion control requirements of the 8/17 letter? Susan Hedman will be at a Brownfields meeting next week along with the Flint mayor and the subject of lead will likely come up.

Tom

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, August 31, 2015 10:35 AM
To: Wurfel, Brad (DEQ)
Cc: Shekter Smith, Liane (DEQ); Wyant, Dan (DEQ); Prysby, Mike (DEQ); Muchmore, Dennis (GOV); Hollins, Harvey (GOV); Murray, David (GOV); Wurfel, Sara (GOV); Jessica Brown; Brown, Eric (GOV)
Subject: Re: Urgent: Independent Flint Water Study

Brad,

We are aware of the VT professor. I can bring you up to speed this afternoon or whenever you are available

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

Sent from my iPhone

On Aug 31, 2015, at 10:25 AM, Wurfel, Brad (DEQ) <WurfelB@michigan.gov> wrote:

Liane / Steve, can you look into this situation as a priority?

Everyone else -- just got this from the ACLU. Call me if you have questions / counsel.

Thanks.

b

Sent from my iPhone

Begin forwarded message:

From: Curt Guyette <cguyette@aclumich.org>
Date: August 31, 2015 at 10:18:34 AM EDT
To: "wurfelb@michigan.gov" <wurfelb@michigan.gov>
Subject: Urgent: Independent Flint Water Study

Mr. Wurfel,

Prof. Marc Edwards of Virginia Tech university has been leading a research project to conduct an independent study of lead in Flint's water. Working with a group of city residents, they have been collecting water samples from homes throughout the city. The study is still under way, but the results so far have been so disturbing that VT has begun posting results on the web in order to alert residents about how serious the problem may be.

This is what VT is reporting:

*Over the weekend we analyzed another 72 lead samples collected by Flint residents and mailed to VT. For the 120 samples analyzed to date, **forty two percent were over 5 ppb**, which suggests a serious lead in water problem according to our experience and criteria. Twenty-three (20% of those collected) also exceeded 15 ppb lead, suggesting a serious lead in water problem. That is, the **Flint Citizen Science study to date, is finding results worse than the EPA standard which is applied to sampling "worst case" homes.** The highest lead sampled in first draw so far was 158 ppb, and the highest sample after 45 second flushing is 1051 ppb. Six of 120 homes sampled (5%), had over 15 ppb lead even after 2 minutes of continuous flushing. The 90%ile lead level in the **Flint Water Study is currently 30 ppb, which is double the EPA standard applied to "worst case" homes, and in a range where water consumption has caused lead poisoning in children and adverse pregnancy outcomes.** Needless to say, these data are very worrisome.*

Here is the website containing the information.

I am writing about this for a story that will be posted tomorrow. If the city chooses to respond, I need to hear back from you by the end of the day today, Aug. 31.

Sincerely,

Curt Guyette

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Monday, August 31, 2015 10:25 AM
To: Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Wyant, Dan (DEQ); Prysby, Mike (DEQ)
Cc: Muchmore, Dennis (GOV); Hollins, Harvey (GOV); Murray, David (GOV); Wurfel, Sara (GOV); Jessica Brown; Brown, Eric (GOV)
Subject: Fwd: Urgent: Independent Flint Water Study

Liane / Steve, can you look into this situation as a priority?

Everyone else -- just got this from the ACLU. Call me if you have questions / counsel.

Thanks.

b

Sent from my iPhone

Begin forwarded message:

From: Curt Guyette <cguyette@aclumich.org>
Date: August 31, 2015 at 10:18:34 AM EDT
To: "wurfelb@michigan.gov" <wurfelb@michigan.gov>
Subject: Urgent: Independent Flint Water Study

Mr. Wurfel,

Prof. Marc Edwards of Virginia Tech university has been leading a research project to conduct an independent study of lead in Flint's water. Working with a group of city residents, they have been collecting water samples from homes throughout the city. The study is still under way, but the results so far have been so disturbing that VT has begun posting results on the web in order to alert residents about how serious the problem may be.

This is what VT is reporting:

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I am writing about this for a story that will be posted tomorrow. If the city chooses to respond, I need to hear back from you by the end of the day today, Aug. 31.

Sincerely,

Curt Guyette

Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Monday, August 31, 2015 8:44 AM
To: Prysby, Mike (DEQ)
Subject: RE: Flint THM

Hi Mike,

Still nothing?

Jeffrey R. Hansen
 Senior Project Manager

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Thursday, August 27, 2015 9:27 AM
To: Hansen, Jeff
Cc: Rosenthal, Adam (DEQ)
Subject: Re: Flint THM

Not yet....I will check with Adam Rosenthal, our EQA, when I return from to office this afternoon.

Sent from my iPhone

On Aug 27, 2015, at 8:19 AM, Hansen, Jeff <jrhansen@lan-inc.com> wrote:

Hi Mike,

Have you seen any results from the DEQ lab for Flint TTHM yet?

Jeffrey R. Hansen
 Senior Project Manager

<image001.gif>
 1311 South Linden Road, Suite B • Flint, MI 48532
 T 810.820.2682 C 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

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Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, August 28, 2015 3:33 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Benzie, Richard (DEQ)
Subject: FW: Flint

Any word?

From: Poy, Thomas [<mailto:poy.thomas@epa.gov>]
Sent: Friday, August 28, 2015 3:29 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint

Liane/Richard: Has Flint replied yet on how they plan to comply with the corrosion control requirements of the 8/17 letter? Susan Hedman will be at a Brownfields meeting next week along with the Flint mayor and the subject of lead will likely come up.

Tom

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

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: 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
Attachments: 3rd Qtr 2015 TTHM preliminary.doc

Richard and Liane,

A PRELIMINARY Flint TTHM compliance determination is attached. (The one month monitoring window doesn't officially end until Monday 8/31).

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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

02310 – City of Flint 3rd Quarter 2015 TTHMs

August 28, 2015

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

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, August 28, 2015 11:05 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: Flint 3Q15 TTHM
Attachments: 3rd Qtr 2015 TTHM summary.doc

02310 – City of Flint 3rd Quarter 2015 TTHMs

August 28, 2015

TTHM Results (mg/L)						
	11/20/14	2/17/15	5/18/15	8/18/15	LRAA	OEL
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DBP6 Rite-Aid Pharmacy 5018 Clio Road	0.054	0.0192	0.0605	0.0595	0.048	0.050
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DBP8 BP Gas Station 822 South Dort Highway	0.036	0.0199	0.0461	0.0549	0.039	0.044

Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Thursday, August 27, 2015 10:13 AM
To: Rosenthal, Adam (DEQ); Prysby, Mike (DEQ)
Subject: RE: Flint THM

Thank you for checking.

Jeffrey R. Hansen
 Senior Project Manager

From: Rosenthal, Adam (DEQ) [mailto:ROSENTHALA@michigan.gov]
Sent: Thursday, August 27, 2015 9:38 AM
To: Prysby, Mike (DEQ); Hansen, Jeff
Subject: RE: Flint THM

I checked the lab database, nothing yet.

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

From: Prysby, Mike (DEQ)
Sent: Thursday, August 27, 2015 9:27 AM
To: Hansen, Jeff
Cc: Rosenthal, Adam (DEQ)
Subject: Re: Flint THM

Not yet....I will check with Adam Rosenthal, our EQA, when I return from to office this afternoon.

Sent from my iPhone

On Aug 27, 2015, at 8:19 AM, Hansen, Jeff <jrhansen@lan-inc.com> wrote:

Hi Mike,

Have you seen any results from the DEQ lab for Flint TTHM yet?

Jeffrey R. Hansen
 Senior Project Manager

<image001.gif>
 1311 South Linden Road, Suite B • Flint, MI 48532
 T 810.820.2682 C 810.333.3201

www.lan-inc.com • JRHansen@lan-inc.com

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Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, August 27, 2015 9:47 AM
To: Brewster, Simone (DEQ)
Cc: Prysby, Mike (DEQ); Hansen, Jeff (jrhansen@lan-inc.com)
Subject: RE: 02310 - Flint THMs

thanks,

Adam

From: Brewster, Simone (DEQ)
Sent: Thursday, August 27, 2015 9:46 AM
To: Rosenthal, Adam (DEQ)
Subject: RE: 02310 - Flint THMs

They should report out by EOB today or for sure tomorrow

Simone Brewster
DEQ Drinking Water Laboratory
Laboratory Services Section
517.335.8184 (T)
517.335.8562 (F)
brewsters@michigan.gov

From: Rosenthal, Adam (DEQ)
Sent: Thursday, August 27, 2015 9:40 AM
To: Brewster, Simone (DEQ)
Subject: 02310 - Flint THMs

Hi Simone, could I get a status on some TTHM/HAA5 samples that were submitted from Flint last week, Aug 18th maybe.

thanks,

Adam

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, August 27, 2015 9:38 AM
To: Prysby, Mike (DEQ); Hansen, Jeff
Subject: RE: Flint THM

I checked the lab database, nothing yet.

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

From: Prysby, Mike (DEQ)
Sent: Thursday, August 27, 2015 9:27 AM
To: Hansen, Jeff
Cc: Rosenthal, Adam (DEQ)
Subject: Re: Flint THM

Not yet....I will check with Adam Rosenthal, our EQA, when I return from to office this afternoon.

Sent from my iPhone

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Hi Mike,

Have you seen any results from the DEQ lab for Flint TTHM yet?

Jeffrey R. Hansen
 Senior Project Manager

<image001.gif>
 1311 South Linden Road, Suite B • Flint, MI 48532
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Rennaker, Joanne (DEQ)

From: Hansen, Jeff <jrhansen@lan-inc.com>
Sent: Thursday, August 27, 2015 8:19 AM
To: Prysby, Mike (DEQ)
Subject: Flint THM

Hi Mike,

Have you seen any results from the DEQ lab for Flint TTHM yet?

Jeffrey R. Hansen

Senior Project Manager



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

A LEO A DALY COMPANY

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

T 810.820.2682 C 810.333.3201

www.lan-inc.com • JRHansen@lan-inc.com

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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, August 26, 2015 3:29 PM
To: Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)
Subject: FW: Follow Up from our Aug. 4th meeting

FYI. In case you get any calls from Ms. Walters.

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

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, August 25, 2015 1:56 PM
To: lwalters313@gmail.com
Cc: Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Follow Up from our Aug. 4th meeting

Dear Ms. Walters,

I wanted to update you regarding our Department's findings related to questions raised during our meeting at the Governor's office on August 4. I apologize for the delay in getting back to you.

Lead and Copper Monitoring

Regarding Flint lead and copper compliance monitoring for the January – June 2015 period, the City has confirmed that all lead and copper samples collected throughout the City, whether routine sites or customer requests, were sent to the State of Michigan lab for analysis. Individual sample results are provided to the property owner within 30 days of receiving the lab results in accordance with the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 410(5)). Results from the State of Michigan lab are provided directly to our Office.

Staff have confirmed that the lead 90th percentile compliance calculation of 11 parts per billion is based on 69 samples that met the appropriate sampling location site criteria, and met the sample collection site and collection protocol requirements of the Safe Drinking Water Act for this monitoring period. A minimum of 60 samples were required for this monitoring period. As indicated during the meeting, the City's sampling for lead complies with the Action Level standard of 15 parts per billion, but based on the population served by the City and these results, the City will need to make a recommendation to the MDEQ on how they will fully optimize their corrosion control treatment. These next steps continue to follow the requirements of the Lead and Copper Rule.

Samples collected at your residence of 212 Browning Avenue were not included this compliance determination as you utilize a whole home filter. As stated in the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 710a, Lead and Copper in tap water; monitoring requirements) "Sampling sites may not include faucets that have point of use or point of entry treatment devices designed to remove inorganic contaminants." Such treatment alters the water chemistry and water quality such that it is no longer representative of public water from the City's distribution

system. Therefore, the City cannot use samples collected at your residence as part of its determination for public water system compliance with the lead or copper action level standard.

Sample Summary (samples taken at your residence)

For your information, we are providing the information that we've gathered regarding samples collected at your home. Our records indicate between February and June of this year there were six samples collected by either you or Mr. Mike Glasgow with the City of Flint, and submitted to the State Laboratory for analysis as follows:

February 11, Bathroom tap, collected at 10:20 AM by Mike Glasgow. This sample was analyzed for aesthetic metals (copper, iron, manganese, and zinc) which does not include lead analysis.

February 18, Kitchen tap, collected at 7:15 AM by you. This sample was analyzed for lead (104 parts per billion) and copper (non-detect).

February 25, Kitchen tap, collected at 10:26 AM by Mike Glasgow. This sample was analyzed for metals including lead. All results (including lead) were non-detect except for Barium 0.01 parts per million. The result for Barium was well below its maximum contaminant level of 2 parts per million.

March 3, Kitchen tap, collected at 6:00 AM by you. This sample was analyzed for lead (397 parts per billion) and copper (non-detect).

March 18, Kitchen tap, collected at 11:10 AM by Mike Glasgow. This sample was analyzed for lead (4 parts per billion) and copper (non-detect).

April 2, Pre-point of service, collected at 8:00 AM by you. This sample was analyzed for lead (707 parts per billion) and copper (110 parts per billion).

Lead Education/Outreach

As we discussed during the meeting, we support efforts to educate homeowners about the sources of lead in their private residence, provide guidance measures to reduce the potential for lead exposure, and provide information on resources for lead abatement. Along those lines, our Office has been in contact with the Department of Health and Human Services, Environmental Health Division, Healthy Homes Section and had some preliminary discussions about a public education and assistance campaign regarding household lead issues, guidance and abatement.

Lead monitoring by public water systems serves a dual purpose. The first purpose is to ensure the public water supply is adequately treating its water to address corrosion potential and help limit lead exposure. The second purpose is to inform homeowners about lead levels within their individual residence so that they can make educated choices regarding their own exposure risk.

pH Results

During the meeting concerns were also expressed regarding pH levels within customer plumbing systems. As you may know, pH has no associated contaminant level as it is simply a numeric scale used to specify the acidity or alkalinity of a solution. The City of Flint conducts daily monitoring of pH values on both its raw and finished (treated) water at the City's water treatment plant as part of its operations. The City is also required to conduct water quality parameter monitoring in the distribution system, which includes pH. Samples are analyzed in accordance with Standard Methods using properly calibrated analytical equipment. Results for pH from these samples are summarized below.

Since late April 2014 – June 2015, the following pH conditions were reported:

Water Treatment Plant – Finished Water plant tap pH range = 7.07 minimum to 9.9 maximum, overall average 7.7, measured daily. We believe the 9.9 is a one- time anomaly from softening treatment.

Distribution System – Water Quality Parameters taken from 25 sample sites located throughout and monitored quarterly

July – Sept. 2014: pH 7.71 average, range 7.56 – 7.86

Oct. – Dec. 2014: pH 7.88 average, range 7.62 – 8.10

Jan. – March 2015: pH 7.81 average, range 7.60 – 7.99

April – June 2015: pH 7.63 Average, range 7.48 – 7.80

In addition, the City's treated water contains alkalinity, which is a measurement of the buffering capacity of water to resist a change in pH. As you can see from the water quality parameter monitoring results above there has been very little change in pH within the City's distribution system. The pH levels described within customer site piping or premise plumbing systems are believed to be the result of onsite treatment and not representative of water quality shown to be occurring in the public water supply system.

Consumer Confidence Report

Finally, there was confusion during the meeting regarding the City's annual water quality report, the Consumer Confidence Report which we have since been able to clarify.

The City of Flint issued two separate Consumer Confidence Reports (CCR's) in 2015 covering the water quality data from 2014. One report was for the period of January – April 2014 when the City was obtaining water from Detroit (DWSD). And a second report was for the period April – December 2014 when the City was using the Flint River and its own Water Treatment Plant.

The CCR for DWSD water was mailed to customers in June. The Flint River based CCR was mailed to customers in mid-July, delayed due to issues with the printing contractor. We agree that having two separate reports caused confusion. We are working with the City to ensure both reports are posted to the City's website and both are made available when requested by customers. Should the City choose to create separate CCR's during the year that the City of Flint connects to the Karegnondi Water Authority we will work with the City to provide more clarity and try to have all material included in a single mailing.

The DWSD based CCR is the one community members had at the meeting, while the DEQ brought a copy of the Flint River based CCR. As separate and distinct sampling was done under each source, this explains the discrepancy in the values and monitoring periods being reported in the respective CCR's.

We appreciate your interest in these matters and hope this has addressed many of the questions brought up during our meeting. I would like to provide this information to both Dr. Sullivan and Ms. Mayes, but I do not have their contact information. I'm hoping you can share this with them and any others that may be interested.

Sincerely,

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: Rosenthal, Adam (DEQ)
Sent: Monday, August 24, 2015 8:53 AM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Water Study-VT

Follow Up Flag: Follow up
Flag Status: Flagged

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Sunday, August 23, 2015 4:57 PM
To: Rosenthal, Adam (DEQ); bwright@cityofflint.com; 'Ptaszinski, Rachel'
Subject: Flint Water Study-VT

Dear Adam, Mike and Rachel,

Hi there. I am a professor at Virginia Tech who specializes in research on corrosion, opportunistic premise plumbing pathogens, lead in water health effects and engineering ethics.

Over the next few months we will be studying Flint water quality issues, in conjunction with all parties who are interested in this subject.

We will be launching our web page to publicly report results of our work.

We visited Flint last week and collected a lot of samples from the distribution system, and we are also doing a lead in water study with residents, to complement that which was recently conducted by the city under the LCR.

Just giving you a heads up on this, and I hope you can give me a point of contact with each of your agencies. Dependent on what we find, it might be desirable to touch base, in advance of our releasing certain findings. We also intend to collaborate with all parties, in an open manner, to the extent that is possible, as our study progresses.

Mike, I think I met you a few years back at a Michigan AWWA event, and Rachel, you were kind enough to send me the coliform/E.Coli data last week. Adam, I am not sure if I have ever met you or not.

My cell phone is 540 320 8740, my office phone is 540 231-7236, and my e-mail is on this message. Feel free to call me at any time, if any of you should have any questions about our plans, or the Flint water quality issues that we will be studying.

Best Regards,
 Marc Edwards

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Thursday, August 20, 2015 5:07 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Rosenthal, Adam (DEQ)
Cc: Poy, Thomas
Subject: 90th percentile letter to Flint?

I was out of the office last week, and I know you all touched base with Tom Poy on the letter you are sending to Flint regarding their lead results. I'm wondering if you could send us a copy of the signed letter when it goes out? Flint has sure gotten a lot of attention over the past year; I'm going to be positive! And say that I hope this all dies down once they connect to the Karegnondi pipeline....

Thank you all!

Jennifer

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Monday, August 17, 2015 2:41 PM
To: Busch, Stephen (DEQ)
Cc: Sygo, Jim (DEQ); Benzie, Richard (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ); Pallone, Maggie (DEQ); Shekter Smith, Liane (DEQ)
Subject: RE: Flint Lead Monitoring Letter

Thanks, Steve!
b

From: Busch, Stephen (DEQ)
Sent: Monday, August 17, 2015 2:36 PM
To: Wurfel, Brad (DEQ)
Cc: Sygo, Jim (DEQ); Benzie, Richard (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ); Pallone, Maggie (DEQ); Shekter Smith, Liane (DEQ)
Subject: Flint Lead Monitoring Letter

Brad,

As there has been much interest regarding lead related to Flint drinking water, I have attached our latest letter which covers the most recent January – June 2015 monitoring period. The City is in compliance with the 15 part per billion action level for lead. Yet based on these results, the treatment cannot be deemed to provide fully optimized corrosion control treatment, and the City will need to recommend additional treatment to achieve this optimization under the Lead and Copper Rule requirements established under the Michigan Safe Drinking Water Act. This is all spelled out in the attached letter.

If you have any questions or would like any additional information you may contact me at the number below.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, August 17, 2015 2:36 PM
To: Wurfel, Brad (DEQ)
Cc: Sygo, Jim (DEQ); Benzie, Richard (DEQ); Cook, Pat (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ); Pallone, Maggie (DEQ); Shekter Smith, Liane (DEQ)
Subject: Flint Lead Monitoring Letter
Attachments: City of Flint PbCu15 8_17_15.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Brad,

As there has been much interest regarding lead related to Flint drinking water, I have attached our latest letter which covers the most recent January – June 2015 monitoring period. The City is in compliance with the 15 part per billion action level for lead. Yet based on these results, the treatment cannot be deemed to provide fully optimized corrosion control treatment, and the City will need to recommend additional treatment to achieve this optimization under the Lead and Copper Rule requirements established under the Michigan Safe Drinking Water Act. This is all spelled out in the attached letter.

If you have any questions or would like any additional information you may contact me at the number below.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

August 17, 2015

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

Dear Mr. Wright:

SUBJECT: Flint, City of WSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), received your report for the monitoring period January 1, 2015, through June 30, 2015.

Action Levels	Results this monitoring period			
	90th Percentile	# of Samples Above Action Level	# of Samples Required	# of Samples Collected
Lead 15 parts per billion (ppb)	11 ppb	6	60	69
Copper 1.3 parts per million (ppm)	0.16 ppm	0	60	69

Ninety percent or more of the sites you tested are within action levels under the administrative rules promulgated under the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). These results must be reported on your 2015 Consumer Confidence Report (CCR) due to our office, your customers, and the local health department, by July 1, 2016. Also include the following statement in the CCR, regardless of the lead and copper levels:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at <http://www.water.epa.gov/drink/info/lead>.

Mr. Brent Wright

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August 17, 2015

Recent changes to the Lead and Copper Rule (LCR) require the water supply to provide individual lead tap results to people who receive water from sites that were sampled, even if lead was not detected, within 30 days of learning of results. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice by three months after the end of the monitoring period. To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit <http://www.michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms under the Manuals, Forms and Brochures heading. Water supplies that fail 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."

While the City's LCR compliance monitoring has continued to meet action level requirements, the LCR also requires all large systems (those serving over 50,000 people) to optimize corrosion control regardless of their 90th percentile lead concentration. One way to demonstrate fully optimized corrosion control treatment is through two consecutive six month rounds of LCR compliance monitoring in which the difference between the 90th percentile level and the highest source water lead concentration is less than the Practical Quantitative Level for lead (0.005 milligrams per liter). Since the City did not meet these criteria in both the July – December 2014, and January – June 2015, sampling periods, the City must now recommend a treatment to fully optimize corrosion control treatment within six months in accordance with requirements under Act 399, Administrative Rule 604f (R 325.10604f). **This recommendation must be provided to our office as soon as possible, but no later than January 1, 2016.**

However, given the past use of phosphate treatment by the Detroit Water and Sewerage Department (DWSD) to fully optimize corrosion control treatment when the City was a wholesale customer of DWSD, the ODWMA recommends the City select this as its recommended treatment option, and begin implementation as soon as possible to address ongoing concerns by customers regarding lead levels within their premise plumbing systems. Under the second step of this Rule, the DEQ can specify optimal corrosion control treatment.

Our office will inform you when monitoring needs to be conducted as part of the optimization of the implemented corrosion control treatment. Customer requested samples for lead shall continue to be collected and analyzed. Please make every attempt to select the same sites used in the previous monitoring period, giving Tier 1 sites first priority. If original sites are unavailable, select replacement sites based on the Tier 1, 2, and 3 criteria.

Please contact me at 517-284-6644 or rosenthala@michigan.gov at your earliest convenience to discuss how the City will be complying with the above requirements.

Sincerely,



Adam Rosenthal, Environmental Quality Analyst
Lansing District Office
Office of Drinking Water and Municipal Assistance

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, August 12, 2015 11:06 AM
To: Benzie, Richard (DEQ)
Cc: Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Shekter Smith, Liane (DEQ); Cook, Pat (DEQ)
Subject: Draft 90th percentile letter
Attachments: Flint PbCu15-draft.doc

Richard,

Attached is our draft 90th percentile Pb/Cu letter for the City of Flint. Could you please forward this to Tinka Hyde and/or Tom Poy at EPA region V. We request any comments back by the close of business on Friday August 17. 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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

DRAFT for August 17, 2015

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

Dear Mr. Wright:

Subject: City Of Flint WSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

We received your report for the monitoring period January 1, 2015, through June 30, 2015.

Action Levels	Results this monitoring period			
	90 th Percentile	# of Samples Above Action Level	# of Samples Required	# of Samples Collected
Lead 15 parts per billion (ppb)	11 ppb	6	60	69
Copper 1.3 parts per million (ppm)	0.16 ppm	0	60	69

Ninety percent or more of the sites you tested are within action levels under the administrative rules promulgated under the Michigan Safe Drinking Water Act, 1976 PA 399, as amended. These results must be reported on your 2015 Consumer Confidence Report (CCR) due to our office, your customers, and the local health department, by July 1, 2016. Also include the following statement in the CCR, regardless of the lead and copper levels:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at <http://water.epa.gov/drink/info/lead>.

Recent changes to the Lead and Copper Rule (LCR) require the water supply to provide individual lead tap results to people who receive water from sites that were sampled, even if lead was not detected, within 30 days of learning of results. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice by 3 months after the end of the monitoring period. To download the *Lead and*

Mr. Brent Wright

2

August 17, 2015

Copper Report and Consumer Notice of Lead Result Certificate in Microsoft Word or PDF format, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms. Water supplies that fail 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."

While the City's LCR compliance monitoring has continued to meet action level requirements, the LCR also requires all large systems (those serving over 50,000 people) to optimize corrosion control regardless of their 90th percentile lead concentration. One way to demonstrate fully optimized corrosion control treatment is through two consecutive six month rounds of LCR compliance monitoring in which the difference between the 90th percentile level and the highest source water lead concentration is less than the Practical Quantitative Level for lead (0.005 mg/l). Since the City of Flint did not meet these criteria in both the July – December 2014, and January – June 2015, sampling periods, the City must now recommend a treatment to fully optimize corrosion control treatment within six months in accordance with requirements under the Michigan Safe Drinking Water Act, Administrative Rule 604f (R 325.10604f). **This recommendation must be provided to our office no later than December 1, 2015.**

However, given the past use of phosphate treatment by the Detroit Water and Sewerage Department (DWSD) to fully optimize corrosion control treatment when the City of Flint was a wholesale customer of DWSD, this Office is recommending the City consider the selection and recommendation of this treatment option, and begin implementation as soon as possible to address ongoing concerns by customers regarding lead levels within their premise plumbing systems.

Further compliance monitoring of your water system for lead and copper will not be required until any additional corrosion control treatment has begun. We will inform you when monitoring is again required. However, customer requested samples for lead shall continue to be collected and analyzed. Please make every attempt to select the same sites used in the previous monitoring period, giving Tier 1 sites first priority. If original sites are unavailable, select replacement sites based on the Tier 1, 2, and 3 criteria.

If you have any questions, please contact me at the number or email listed below.

Sincerely,

Adam Rosenthal, EQA
Office of Drinking Water and Municipal Assistance
Lansing District
517-284-6644
rosenthala@michigan.gov

ar/jlr
Enclosures

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Monday, August 10, 2015 1:06 PM
To: Prysby, Mike (DEQ)
Subject: Re: City of Flint MOR - June 2015
Attachments: July 2015 MOR.pdf

Mike,

Here is the July MOR. A hard copy will go out today.

On Mon, Aug 10, 2015 at 10:47 AM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Michael,

Is a copy of the July 2015 MOR available? Need to compile the most recent pH information. Thanks.

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Friday, July 10, 2015 4:13 PM
To: Prysby, Mike (DEQ)
Subject: City of Flint MOR - June 2015

Mike,

Here is a copy of the June MOR. A hard copy was mailed out earlier today.

--

Mike Glasgow

Utilities Administrator

City of Flint

| 1101 S. Saginaw St.

Flint, MI 48502

(810)766-7135 ext. 2602

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

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANTWSSN: 2310Michael Glasgow

Operator-in-Charge

July 2015

Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification

Signature of Operator-in-Charge

Genesee

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>18.5</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>124</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.5</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.3</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>1.0%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>24,000</u> lb.	Est. supply:	<u>28</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>153,000</u> lb.	Est. supply:	<u>10</u> days
Lime (CaO) on hand:	<u>197</u> tons	Est. supply:	<u>17</u> days
Fluoride on Hand:	<u>6,000</u> lb.	Est. supply:	<u>13</u> days
Cost of All Chemicals per Million Gallons:	<u>n/a</u> dollars		
Total Power Cost per Million Gallons:	<u>n/a</u> dollars		

Remarks

Confluence Point # 1 (N)

Confluence Point # 2 (S)

Number of filter confluence samples > 0.3 NTU:	<u>1</u>	<u>0</u>
Number of filter confluence samples collected:	<u>218</u>	<u>218</u>
Percent of filter confluence samples > 0.3 NTU:	<u>0.5%</u>	<u>0.0%</u>
Number of filter confluence samples > 1 NTU	<u>0</u>	<u>0</u>

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?	<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.	
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation?	<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.	
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months?	<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.	
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months?	<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.	

Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? NO
 If yes, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.

Did POE disinfectant residual fall below 0.2 ppm during the month? NO
 If yes, indicate date(s) and duration on a separate sheet.

Was minimum C*T credit achieved for the entire month? YES
 If no, indicate on a separate sheet the date(s) not achieved.

Was continuous POE chlorine residual monitoring equipment off-line during the month? NO
 If yes, indicate date(s) and duration on a separate sheet.

WSSN: 2310

[illegible]

Filter turbidity

City of Flint Water Treatment Plant
WSSN: 2310

July 2015

Page 3

Date	Turbidity, Units												Point of Entry
	Confluence Point, No.1 (N) North						Confluence Point, No.2 (S) South						
	Number of Samples	Avg.	Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU	No. of Samples >0.3 NTU	Number of Samples	Avg.	Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU	No. of Samples >0.3 NTU	
1	7	0.10	0.13	6	0	0	7	0.09	0.12	6	0	0	0.11
2	7	0.11	0.15	6	0	0	7	0.09	0.12	6	0	0	0.09
3	8	0.09	0.11	6	0	0	8	0.09	0.11	6	0	0	0.13
4	8	0.09	0.13	6	0	0	8	0.08	0.09	6	0	0	0.11
5	8	0.08	0.09	6	0	0	8	0.08	0.11	6	0	0	0.09
6	7	0.09	0.12	6	0	0	7	0.08	0.09	6	0	0	0.10
7	7	0.10	0.12	6	0	0	7	0.09	0.10	6	0	0	0.10
8	6	0.11	0.13	6	0	0	6	0.10	0.11	6	0	0	0.09
9	7	0.11	0.15	6	0	0	7	0.10	0.10	6	0	0	0.11
10	7	0.11	0.11	6	0	0	7	0.10	0.12	6	0	0	0.12
11	7	0.12	0.25	6	0	0	7	0.11	0.13	6	0	0	0.10
12	6	0.08	0.11	6	0	0	6	0.10	0.13	6	0	0	0.08
13	7	0.10	0.11	6	0	0	7	0.10	0.12	6	0	0	0.10
14	7	0.18	0.31	6	1	1	7	0.11	0.11	6	0	0	0.11
15	7	0.14	0.20	6	0	0	7	0.12	0.16	6	0	0	0.13
16	7	0.14	0.20	6	0	0	7	0.12	0.15	6	0	0	0.12
17	7	0.13	0.15	6	0	0	7	0.12	0.14	6	0	0	0.18
18	7	0.14	0.20	6	0	0	7	0.12	0.16	6	0	0	0.15
19	7	0.16	0.19	6	0	0	7	0.14	0.18	6	0	0	0.18
20	7	0.13	0.18	6	0	0	7	0.12	0.16	6	0	0	0.12
21	7	0.14	0.17	6	0	0	7	0.14	0.19	6	0	0	0.12
22	7	0.15	0.20	6	0	0	7	0.15	0.19	6	0	0	0.16
23	7	0.14	0.18	6	0	0	7	0.13	0.15	6	0	0	0.15
24	7	0.17	0.19	6	0	0	7	0.17	0.20	6	0	0	0.16
25	7	0.17	0.19	6	0	0	7	0.16	0.19	6	0	0	0.14
26	7	0.14	0.17	6	0	0	7	0.13	0.15	6	0	0	0.13
27	7	0.16	0.22	6	0	0	7	0.15	0.21	6	0	0	0.16
28	7	0.15	0.16	6	0	0	7	0.14	0.16	6	0	0	0.13
29	7	0.13	0.17	6	0	0	7	0.12	0.13	6	0	0	0.12
30	7	0.12	0.14	6	0	0	7	0.13	0.16	6	0	0	0.13
31	7	0.08	0.10	6	0	0	7	0.10	0.13	6	0	0	0.12
Avg.	7	0.12	0.16	6	0	0	7	0.11	0.14	6	0	0	
Max.	8	0.18	0.31	6	1	1	8	0.17	0.21	6	0	0	0.18
Min.	6	0.08	0.09	6	0	0	6	0.08	0.09	6	0	0	

[illegible]

WSSN: 2310

Date	pH (S.U.)		Total Hardness as CaCO ₃ (mg/L)		Total Alkalinity as CaCO ₃ (mg/L)		Non-Carbonate Hardness as CaCO ₃ (mg/L)		Calcium as Ca ²⁺ (mg/L)		Magnesium as Mg ²⁺ (mg/L)		Chloride as Cl ⁻ (mg/L)	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
1	8.37	7.59	232	148	190	56	42	92	67.3	46.5	15.6	7.8	45	84
2	8.12	7.36	260	150	220	54	40	96	77.8	50.5	16.0	5.8	47	87
3	8.40	7.43	260	155	218	55	42	100	89.0	56.9	9.2	2.9	43	89
4	8.35	7.40	252	153	210	52	42	101	80.2	52.1	12.6	3.9	42	86
5	8.18	7.49	258	156	216	54	42	102	89.8	52.1	8.3	6.8	42	86
6	8.19	7.48	264	156	208	56	56	100	85.8	57.7	12.2	2.9	44	88
7	8.06	7.68	258	156	212	50	46	106	87.4	50.5	9.7	7.3	48	85
8	7.98	7.52	252	148	208	54	44	94	85.0	51.3	9.7	4.9	43	77
9	8.18	7.49	246	152	208	52	38	100	80.2	52.9	11.2	4.9	43	82
10	8.22	7.47	244	150	202	52	42	98	84.2	55.3	8.3	2.9	43	77
11	8.30	7.54	250	150	206	62	44	88	85.8	48.9	8.7	6.8	47	81
12	8.21	7.45	256	144	214	48	42	96	79.4	47.3	14.1	6.8	42	89
13	8.36	7.60	242	142	200	50	42	92	79.4	47.3	10.7	5.8	45	83
14	7.83	7.45	250	144	208	50	42	94	75.4	39.3	15.1	11.2	50	84
15	8.13	7.38	250	134	212	48	38	86	81.8	41.7	11.2	7.3	44	81
16	8.16	7.43	252	156	212	48	40	108	78.6	44.1	13.6	11.2	44	79
17	8.05	7.36	256	140	206	52	50	88	82.6	45.7	9.2	8.7	43	78
18	8.07	7.42	248	132	206	42	42	90	80.2	40.1	11.7	7.8	41	80
19	8.13	7.45	252	134	212	44	40	90	80.2	47.3	12.6	3.9	43	76
20	8.21	7.53	248	142	214	46	34	96	78.6	43.3	12.3	8.3	42	79
21	8.15	7.35	250	134	220	54	30	80	82.6	41.7	10.7	7.3	42	79
22	8.31	7.42	252	132	216	44	36	88	76.2	36.9	15.1	9.7	44	80
23	8.33	7.35	252	136	214	36	38	100	81.8	40.1	11.7	8.7	43	84
24	8.28	7.34	246	136	206	34	40	102	79.4	39.3	11.7	9.2	43	83
25	8.24	7.52	248	149	208	47	40	102	76.2	38.5	14.1	8.7	43	81
26	8.15	7.43	254	153	212	51	42	102	85.0	47.3	10.2	7.3	43	89
27	8.14	7.40	258	146	216	48	42	98	77.0	48.9	16.0	5.8	45	88
28	8.19	7.42	248	162	210	58	38	104	79.4	61.7	12.2	1.9	45	96
29	8.03	7.32	242	152	206	50	36	102	79.4	54.5	10.7	3.9	47	100
30	7.97	7.37	240	158	206	60	34	98	70.5	58.5	15.6	2.9	51	98
31	7.91	7.37	248	156	212	52	36	104	75.4	55.3	14.6	4.4	51	99
Avg.	8.17	7.45	251	147	210	50	41	97	80.4	48.2	12.1	6.4	44	85
Max.	8.40	7.68	264	162	220	62	56	108	89.8	61.7	16.0	11.2	51	100
Min.	7.83	7.32	232	132	190	34	30	80	67.3	36.9	8.3	1.9	41	76

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

July 2015

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Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conductivity (mS)	Temp. C	Color		Odor	
	Raw (Colilert MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap	Tap	Raw	Raw	Tap	Raw	Tap
1	1	4884	12	0	1	0	2870	< 2	0.44	22.5				
2	1	3448	12	0	1	0	2020	< 2	0.44	22.3				
3	1	3654	12	0	1	0	2390	< 2	0.45	22.1				
4	1	4611	12	0	1	0	1830	< 2	0.44	23.5				
5	1	5172	12	0	1	0	1830	< 2	0.45	22.5				
6	1	3873	12	0	1	0	1890	< 2	0.45	22.8				
7	1	5794	12	0	1	0	1460	< 2	0.43	23.5				
8	1	3654	12	0	1	0	1950	< 2	0.41	22.0				
9	1	6867	12	0	1	0	2990	< 2	0.43	22.5				
10	1	4106	12	0	1	0	1830	< 2	0.41	23.3				
11	1	3654	12	0	1	0	2090	< 2	0.43	23.5				
12	1	3654	12	0	1	0	1510	< 2	0.42	22.9				
13	1	4884	12	0	1	0	1510	< 2	0.41	24.8				
14	1	11191	12	0	1	0	7380	< 2	0.40	23.3				
15	1	8164	12	0	1	0	3390	< 2	0.40	23.1				
16	1	6867	12	0	1	0	2020	< 2	0.40	25.9				
17	1	3873	12	0	1	0	1460	< 2	0.41	23.8				
18	1	3873	12	0	1	0	5550	< 2	0.39	24.4				
19	1	5794	12	0	1	0	3390	< 2	0.39	24.4				
20	1	6867	12	0	1	0	2870	< 2	0.39	24.4				
21	1	8664	12	0	1	0	2870	< 2	0.39	24.5				
22	1	4884	12	0	1	0	2870	< 2	0.39	25.1				
23	1	6480	12	0	1	0	3550	< 2	0.40	24.9				
24	1	6480	12	0	1	0	3390	< 2	0.40	25.1				
25	1	7270	12	0	1	0	4440	< 2	0.42	25.2				
26	1	8164	12	0	1	0	4140	< 2	0.44	25.1				
27	1	7270	12	0	1	0	2230	< 2	0.43	26.0				
28	1	5172	12	0	1	0	2660	< 2	0.47	27.6				
29	1	6867	12	0	1	0	6230	< 2	0.45	27.2				
30	1	17329	12	0	1	0	3240	< 2	0.48	26.2				
31	1	19863	12	0	1	0	4700	< 2	0.48	25.5				

Avg.									0.42	24.2				
Max.		19863					7380	< 2	0.48	27.6				
Min.									0.39	22.0				

Distribution System
MonitoringCity of Flint Water Treatment Plant
WSSN: 2310

July 2015

Page 7

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WS	
1	0.5	1.0	1.1	0.3	0.2	0.2	0.6	1.3	0.7	1.4	10
2											0
3											0
4											0
5											0
6											0
7	0.1	1.1	1.0	0.2	1.9	0.2	0.5	1.0	1.3	4.0	10
8	1.1	0.3	1.2	0.1	0.8	0.3			0.5	1.2	8
9	0.1	0.7	1.2	0.2	0.1	0.2	0.4	1.1	0.2	1.3	10
10											0
11											0
12											0
13											0
14	0.9	1.0	1.0	0.1	0.2	0.2	0.5	1.3	0.3	1.2	10
15	0.1	0.9	1.0	0.4	0.6	0.1	0.2	1.3	0.6	1.2	10
16											0
17											0
18											0
19											0
20											0
21											0
22	0.5	0.5	0.9	0.2	0.1	0.1	0.3	1.0	0.6	1.6	10
23	0.6	0.7	0.9	0.2	0.1	0.1	0.1	1.2	0.1	1.3	10
24											0
25											0
26											0
27											0
28	0.6	0.9	1.0	0.3	0.3	0.1	0.5	1.0	0.9	1.0	10
29											0
30	0.6	0.7	0.8	0.1	0.1	0.5	0.3	1.7	0.1	1.2	10
31				0.2	0.4	0.2					3

Distribution Sample Summary

Total # of routine distribution samples analyzed	101
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	1
Percent of routine distribution samples positive	1%

See page 9 for positive sample information.

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	0.67

Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WS	
1	0.9	1.3	1.4	0.6	0.4	0.4	0.9	1.7	1.0	1.7	10
2											0
3											0
4											0
5											0
6											0
7	0.1	1.4	1.2	0.3	2.2	0.4	0.8	1.3	1.6	4.0	10
8	1.4	0.6	1.6	0.4	1.0	0.5			0.8	1.5	8
9	0.2	1.0	1.5	0.4	0.2	0.5	0.6	1.4	0.4	1.6	10
10											0
11											0
12											0
13											0
14											0
15	1.3	1.3	1.3	0.3	0.4	0.4	0.8	1.7	0.5	1.5	10
16	0.2	1.2	1.3	0.7	0.9	0.2	0.5	1.5	0.9	1.5	10
17											0
18											0
19											0
20											0
21											0
22	0.8	0.8	1.3	0.5	0.3	0.2	0.5	1.4	0.9	2.0	10
23	0.9	1.1	1.2	0.5	0.4	0.3	0.3	1.5	0.1	1.6	10
24											0
25											0
26											0
27											0
28	0.8	1.3	1.3	0.5	0.5	0.2	0.8	1.4	1.3	1.3	10
29											0
30	1.0	1.2	1.3	0.3	0.3	0.2	0.6	2.3	0.3	1.5	10
31				0.4	0.6	0.4					3

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	0.9

Positive Distribution Samples

[illegible]

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 10, 2015 11:47 AM
To: Busch, Stephen (DEQ)
Subject: Flint pH
Attachments: Flint pH 2014-2015.doc

Steve,

Attached is a summary of WTP Ptap and Dist. pH values for Flint for the months of April, May, and June. I have not received the July MOR or the 2015 2nd Qtr WQP report from the city....

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

**City of Flint
Water System pH**

WTP Plant Tap

April 2015 :	Avg: 7.83	Range: 7.54 - 8.02
May 2015:	Avg: 7.60	Range: 7.35 - 7.88
June 2015:	Avg: 7.61	Range: 7.40 - 7.76

WQ Parameter Sites:

25 locations: Routine bacteriological monitoring sites (8 locations) and the Westside and Cedar Street reservoirs. 15 additional sites throughout the city following expansion of the pb/cu monitoring program.

2014 - 3rd Qtr:	Avg: 7.71	Range: 7.56 – 7.86
2014 - 4th Qtr:	Avg: 7.88	Range: 7.62 – 8.10
2015 - 1st Qtr	Avg: 7.81	Range: 7.60 – 7.99

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, August 10, 2015 10:47 AM
To: Michael Glasgow
Subject: RE: City of Flint MOR - June 2015

Michael,

Is a copy of the July 2015 MOR available? Need to compile the most recent pH information. Thanks.

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

From: Michael Glasgow [<mailto:mglasgow@cityofflint.com>]
Sent: Friday, July 10, 2015 4:13 PM
To: Prysby, Mike (DEQ)
Subject: City of Flint MOR - June 2015

Mike,

Here is a copy of the June MOR. A hard copy was mailed out earlier today.

--

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

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Wednesday, August 05, 2015 4:03 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Lead/copper 90th letter
Attachments: Flint PbCu15 with PC additions.doc

updated with revised 90ths

From: Cook, Pat (DEQ)
Sent: Friday, July 31, 2015 2:05 PM
To: Rosenthal, Adam (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Lead/copper 90th letter

Hi Adam - I added a paragraph (in red) at the end of the letter to inform them that they will have to optimize corrosion control and we'll be contacting them in the near future to discuss in further detail.

pat

From: Rosenthal, Adam (DEQ)
Sent: Thursday, July 30, 2015 2:11 PM
To: Cook, Pat (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Flint Lead/copper 90th letter

Attached for editing

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

July 27, 2015

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

Dear Mr. Wright:

Subject: City Of Flint WSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

We received your report for the monitoring period January 1, 2015, through June 30, 2015.

Action Levels	Results this monitoring period		Next monitoring period	
	90 th Percentile	# of Samples Above Action Level	# of Samples Required	Take Samples Within These Dates
Lead 15 parts per billion (ppb)	11 ppb	6	60	1/1 and 6/30/2017 Submit results to this office by July 10, 2017
Copper 1.3 parts per million (ppm)	0.16 ppm	0		

Ninety percent of the sites you tested are within action levels under the administrative rules promulgated under the Michigan Safe Drinking Water Act, 1976 PA 399, as amended. These results must be reported on your 2015 Consumer Confidence Report (CCR) due to our office, your customers, and the local health department, by July 1, 2016. Also include the following statement in the CCR, regardless of the lead and copper levels:

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at <http://water.epa.gov/drink/info/lead>.

Mr. Brent Wright

2

July 27, 2015

Recent changes to the Lead and Copper Rule (LCR) require you to provide individual lead tap results to people who receive water from sites that were sampled, even if lead was not detected, within 30 days of learning of results. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice by 3 months after the end of the monitoring period. To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms. Water supplies that fail 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."

Samples due the next monitoring period will mark your first six month round of monitoring after connection to the Karegnondi Water Authority (KWA). Please make every attempt to select the same sites used in the previous monitoring period, giving Tier 1 sites first priority. If original sites are unavailable, select replacement sites based on the Tier 1, 2, and 3 criteria. We strongly encourage you to sample early in the monitoring period.

Finally, the LCR requires all large systems (those serving over 50,000 people) to optimize corrosion control regardless of their 90th percentile lead concentration, unless the difference between the 90th percentile and the highest source water lead concentration is less than the Practical Quantitative Level for lead (0.005 mg/l). Since the City of Flint did not meet this criteria in both the July – December 2014, and January – June 2015, sampling periods, the city will have to optimize corrosion control. We will be contacting you soon to discuss the items the city must complete to comply with the optimal corrosion requirements of the LCR.

Bottles will NOT be mailed automatically. To order bottles, call the Department of Environmental Quality 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.

Sincerely,

Adam Rosenthal, EQA
Office of Drinking Water and Municipal Assistance
Lansing District
517-284-6644
rosenthala@michigan.gov

ar/jlr
Enclosures

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Friday, July 31, 2015 2:05 PM
To: Rosenthal, Adam (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Lead/copper 90th letter
Attachments: Flint PbCu15 with PC additions.doc

Hi Adam - I added a paragraph (in red) at the end of the letter to inform them that they will have to optimize corrosion control and we'll be contacting them in the near future to discuss in further detail.

pat

From: Rosenthal, Adam (DEQ)
Sent: Thursday, July 30, 2015 2:11 PM
To: Cook, Pat (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Flint Lead/copper 90th letter

Attached for editing

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

July 27, 2015

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

Dear Mr. Wright:

Subject: City Of Flint WSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

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Action Levels	Results this monitoring period		Next monitoring period	
	90 th Percentile	# of Samples Above Action Level	# of Samples Required	Take Samples Within These Dates
Lead 15 parts per billion (ppb)	11 ppb	7	60	1/1 and 6/30/2017 Submit results to this office by July 10, 2017
Copper 1.3 parts per million (ppm)	0.16 ppm	0		

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Mr. Brent Wright

2

July 27, 2015

Recent changes to the Lead and Copper Rule (LCR) require you to provide individual lead tap results to people who receive water from sites that were sampled, even if lead was not detected, within 30 days of learning of results. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice by 3 months after the end of the monitoring period. To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms. Water supplies that fail 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."

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Sincerely,

Adam Rosenthal, EQA
Office of Drinking Water and Municipal Assistance
Lansing District
517-284-6644
rosenthala@michigan.gov

ar/jlr
Enclosures

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, July 30, 2015 2:11 PM
To: Cook, Pat (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: Flint Lead/copper 90th letter
Attachments: Flint PbCu15.doc

Attached for editing

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

July 27, 2015

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

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Mr. Brent Wright

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March 30, 2015

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Sincerely,

Adam Rosenthal, EQA
Office of Drinking Water and Municipal Assistance
Lansing District
517-284-6644
rosenthala@michigan.gov

ar/jlr
Enclosures

cc: Mr. Michael Glasgow, City of Flint

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, July 29, 2015 6:12 PM
To: Howard Croft
Subject: Re: City of Flint TTHM Public Notice - April 1, 2015

Thanks Howard...

Sent from my iPhone

On Jul 29, 2015, at 4:55 PM, Howard Croft <hcroft@cityofflint.com> wrote:

Mike,

Yes,

We mailed the update along with the notice.

On Tue, Jul 28, 2015 at 12:55 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Howard,

A quick question....the second TTHM public notice that was sent to city residents on or around April 1, 2015 included a Water Quality Update. Were both documents sent out at the same time?

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

--

Howard Croft

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

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Wednesday, July 29, 2015 4:55 PM
To: Prysby, Mike (DEQ)
Subject: Re: City of Flint TTHM Public Notice - April 1, 2015

Mike,

Yes,

We mailed the update along with the notice.

On Tue, Jul 28, 2015 at 12:55 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Howard,

A quick question....the second TTHM public notice that was sent to city residents on or around April 1, 2015 included a Water Quality Update. Were both documents sent out at the same time?

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

--

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: Scherbarth, John (AG)
Sent: Wednesday, July 29, 2015 3:44 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Probably Ok at this time. I decided to simply attach the one page notice that we know went out around April 1.

John C. Scherbarth

From: Prysby, Mike (DEQ)
Sent: Wednesday, July 29, 2015 1:44 PM
To: Scherbarth, John (AG)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,

Still waiting to hear back from the city regarding distribution of the Water Quality Report.....I just made a second inquiry.

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

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 12:51 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Thanks so much for your help. I will wait for your confirmation.

John C. Scherbarth

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:37 PM
To: Scherbarth, John (AG)
Cc: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,

The update accurately states that the results from all eight location were below the maximum contaminate level (MCL) in February's monitoring; however, it re-iterates that the annual quarterly average is still above the state's allowable level – MCL.

I would re-word the last sentence of the narrative to read: The city of Flint will return to compliance with the TTHM MCL after the Locational Running Annual Average (LRAA) no longer exceeds the 80 ug/L MCL at all eight locations. The LRAA is the running annual average of samples collected quarterly at each location.

I will need to confirm with the city as to whether both documents were sent out at the same time.

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

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 12:12 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Were these both sent out at the same time?

And, isn't the Water Quality Update inaccurate since the City is not in compliance until the averages for a year are below MCLs?

I want to be certain that the following narrative is correct:

"During February, the detected level has been in an acceptable range at all eight sampling locations. Another sampling occurred during the month of May, and, again, the detected level was found to be in the acceptable range at all sampling locations. However, before the City of Flint can be considered to be in compliance, it must meet the compliance levels for a full year."

John C. Scherbarth

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:02 PM
To: Scherbarth, John (AG)
Cc: Rosenthal, Adam (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,
Attached is a copy of the 2nd quarter TTH PN that was distributed to Flint city residents around April 1, 2015. Also, included with the PN is further discussion of the TTHM levels and the trend in concentration.

Michael Prysby, P.E.

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

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 11:26 AM
To: Prysby, Mike (DEQ)
Cc: Rosenthal, Adam (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Mike

Can you please send me a PDF version of the notice that the City of Flint sent on or about April 1?

John C. Scherbarth

From: Rosenthal, Adam (DEQ)
Sent: Tuesday, July 28, 2015 11:14 AM
To: Scherbarth, John (AG)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

thanks,

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

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, June 09, 2015 12:39 PM
To: Howes, Sarah (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)
Cc: Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Attached is a copy of the Violation Notice and Public Notice Template being mailed to the City of Flint by the DEQ Office of Drinking Water and Municipal Assistance regarding an exceedance of the Maximum Contaminant Level (MCL) standard for Total Trihalomethanes at certain locations within the City's drinking water distribution system.

This violation notice is in response to updated monitoring completed in May 2015, which shows the locational running annual average for one of the City's eight compliance sampling locations continues to exceed MCL standard of 0.080

mg/L. It is however, important to note that all individual compliance sample results collected in both May and February were below the 0.080 mg/L levels.

You are being provided an electronic copy of this notice as exceedance of this drinking water standard is expected to generate inquiries from water system customers, news media, and the general public.

Sarah Howes or Maggie Pallone will be informing members of the Michigan legislature.

If you have any questions or would like any additional information, you may contact Michael Prysby, District Engineer, DEQ-ODWMA at 517-290-8817, or you may contact me at the number below.

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

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, July 29, 2015 1:56 PM
To: Brent Wright
Subject: RE: Flint TTHM Public Notice - April 1, 2015

Yes....however, our AG keeps asking if they went out at the same time...I would assume so...however, I haven't heard back from Howard K. to confirm this.....

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

From: Brent Wright [mailto:bwright@cityofflint.com]
Sent: Wednesday, July 29, 2015 1:54 PM
To: Prysby, Mike (DEQ)
Subject: Re: Flint TTHM Public Notice - April 1, 2015

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On Wed, Jul 29, 2015 at 1:40 PM, Prysby, Mike (DEQ) <PRYSBYM@michigan.gov> wrote:

Thanks Brent....do you know if the Water Quality Update sheet was also sent to each resident and at the same time....or was this just posted on the website?

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

From: Brent Wright [mailto:bwright@cityofflint.com]
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Cc: Michael Glasgow; Rosenthal, Adam (DEQ)
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Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

--

Brent Wright

Water Plant Supervisor

City of Flint

4500 N. Dort Hwy.

Flint, MI. 48505

Ph: 810.787.6537 ext. 3510

Fx: 810.787.3710

--
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Fx: 810.787.3710

Rennaker, Joanne (DEQ)

From: Henry, James <jhenry@gchd.us>
Sent: Tuesday, July 28, 2015 4:38 PM
To: deborah.d.conrad@gmail.com
Cc: Prysby, Mike (DEQ); mglasgow@cityofflint.com
Subject: FW: HIGH LEAD REPORT

Hello Ms. Conrad,

I've copied Flint City and MDEQ regarding elevated Lead that was detected in your City of Flint residential water. You may want to speak with them regarding your situation. Below are some recommendations to reduce Lead. Please refer to the following Center for Disease Control links.

<http://www.cdc.gov/nceh/lead/tips/water.htm>

<http://www.cdc.gov/nceh/lead/tips.htm>

The following information was obtained from the tips link.

Before using any tap water for drinking or cooking, flush your water system by running the kitchen tap (or any other tap you take drinking or cooking water from) on COLD for 1–2 minutes; Then, fill a clean container(s) with water from this tap. This water will be suitable for drinking, cooking, preparation of baby formula, or other consumption. To conserve water, collect multiple containers of water at once (after you have fully flushed the water from the tap as described).

Types of Point-of-Use Devices for Lead Reduction

Reverse-Osmosis

Reverse-osmosis devices, usually installed underneath the sink, use a membrane with pores tiny enough to screen out contaminants. They are effective in reducing inorganic materials, including lead. However, these units are expensive and may be difficult to install. In addition, reverse-osmosis units waste water by shunting at least three gallons of water directly down the drain for every gallon that is treated. Despite their cost and other drawbacks, reverse-osmosis devices may be considered for situations in which maximum lead reduction is necessary.

Distillers

Distillers are another effective means of reducing lead in water. A distiller uses electricity to boil water. After water from the tap is poured into the distiller, the unit condenses the steam, reducing contaminants in the process, and allows clean water to drip into a collection jug. The purchase price is much lower than that of a reverse-osmosis unit but the operating cost is higher because of the electricity needed to run the distiller. A distiller can sit on top of a counter. The only installation involved is plugging it into an electrical outlet.

Filters

Filters, the simplest type of point-of-use devices, trap particles in a porous material while allowing water to pass through. There are many brands and types of filters which vary in their effectiveness at reducing lead. Product literature should be checked to determine the filter's capabilities.

Undersink Filters

Undersink filters send water through prefilters to remove sediment and organic chemicals, then through a lead-

reducing filter. Attached to the cold-water line beneath the sink, these filters are less expensive and much easier to install than reverse-osmosis devices although a hole may have to be drilled through the counter to allow passage for the treatment unit's spigot.

Countertop Filter

These types of filters typically have a hose that attaches to the faucet. At this connection is a diverter with a valve inside. When water is needed for non-consumptive purposes, it can be drawn through the tap as usual. When it is needed for drinking or cooking, the valve in the diverter can be activated to shunt the water through the filter, where it is treated, and then out a spigot in the unit.

Faucet Filter

This is similar to a countertop unit, but, instead of being connected to the faucet with a hose, this filter sits atop the faucet. When the diverter valve is activated, water flows through the filter and out an opening in the unit.

With any type of filter, regular maintenance is critical. As filters remove particles from the water, they become clogged and have to be replaced or cleaned. Failure to do so may result in an increase in the bacteriological content in the water.

Considerations In Purchasing a POU Device

Purchase price is not the only consideration that should be made when buying a home water treatment unit. Cost of operation and effectiveness should be also taken into account in addition to the unit's efficiency with regard to how much water it wastes in processing a certain quantity of treated water.

Two reliable sources of information on treatment units are NSF International and the Water Quality Association (WQA). NSF International develops and adopts voluntary, consensus standards and testing programs for a wide variety of water treatment units. WQA represents firms and individuals engaged in the design, manufacture, production, distribution, and sale of equipment, products, supplies, and services for providing quality water.

Neither NSF nor WQA recommends particular brands of home treatment units, but both have literature for consumers and can offer advice on the type of treatment unit needed.

Note: Water *treatment* devices—which are designed to reduce chemical contaminants, including lead, from the water—should not be confused with water *purification* devices, which are designed to remove bacteria.

Treatment devices *will not* remove bacteria from the water and may actually increase bacterial content. The Minnesota Department of Health recommends that POU devices be used only on water that is free of harmful bacteria.

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



*NOTICE: This e-mail, including attachments, is intended for the exclusive use of the addressee and may contain proprietary, confidential or privileged information. If you are not the intended recipient, any disclosure, use, distribution, copying, or taking of any action in reliance of the contents of this e-mail is strictly prohibited. If you have received this e-mail in error, please notify me via e-mail and permanently delete the original and destroy all copies. Thank you.

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

Rennaker, Joanne (DEQ)

From: Brent Wright <bwright@cityofflint.com>
Sent: Tuesday, July 28, 2015 2:41 PM
To: Prysby, Mike (DEQ)
Cc: Michael Glasgow; Rosenthal, Adam (DEQ)
Subject: Re: Flint TTHM Public Notice - April 1, 2015
Attachments: Water-Quality-Update-to-Residents-April-2015.pdf; Scan014.PDF; Scan013.PDF

Mike

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District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

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Brent Wright
Water Plant Supervisor
City of Flint
4500 N. Dort Hwy.
Flint, MI. 48505
Ph: 810.787.6537 ext. 3510
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Water Quality Update



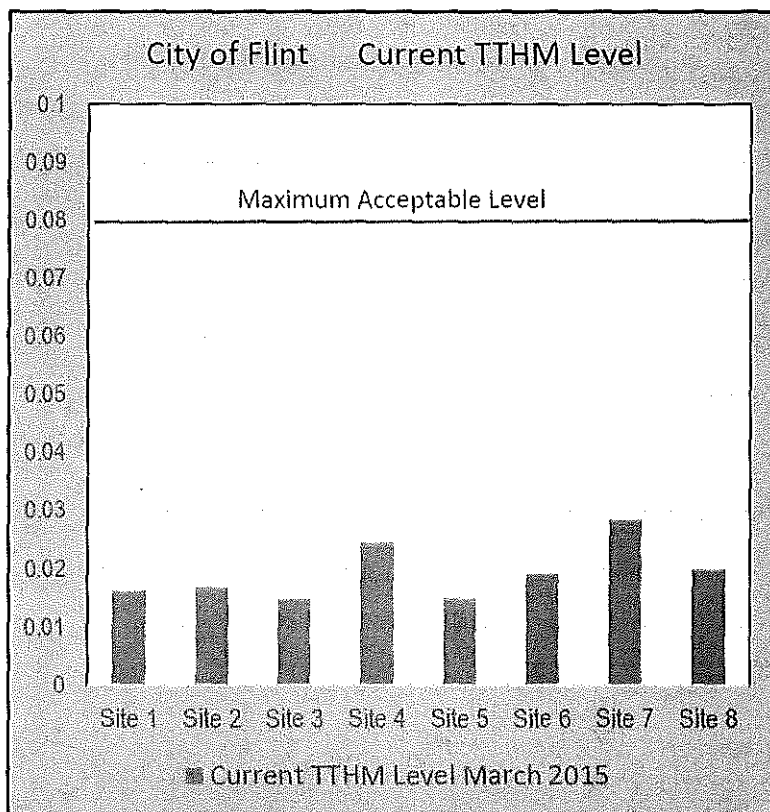
City of Flint Resident:

We are pleased to report that City of Flint water is safe and meets U.S. Environmental Protection Agency guidelines. While we continue to work on improving aesthetic qualities, such as discoloration or odor, you can be confident that the water provided to you today meets all safety standards. Maintaining safety and quality in our water is a top priority of the City.

We accomplished this by:

- Upgrading the ozone treatment process at the Water Treatment Plant
- Increasing water main/hydrant flushing to reduce stagnation
- Conducting additional testing of treatment to identify areas of improvement
- Improving water circulation by repairing valves and adjusting reservoir levels

Our most recent testing in February showed that every testing site was well below allowable levels, as shown below:



City of Flint





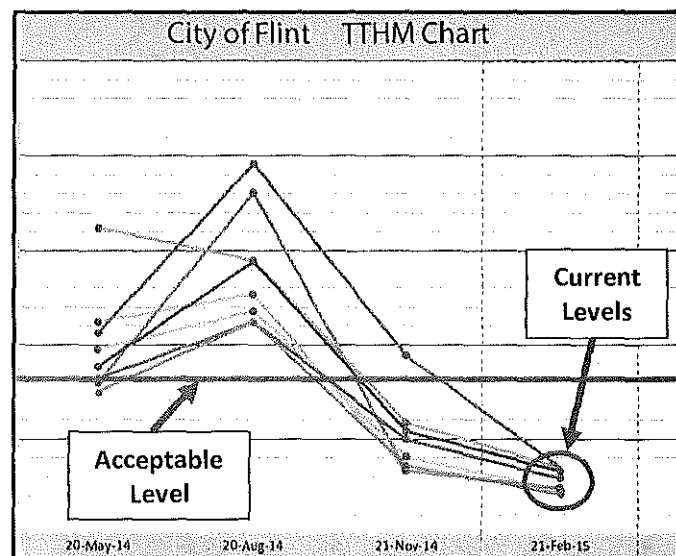
Water Quality Update



The Michigan Department of Environmental Quality (MDEQ) has acknowledged our progress:

"We are encouraged by the results from the most recent round of compliance samples collected on February 17, 2015, which now show individual TTHM levels at less than half of the 0.080 mg/L standard at all locations throughout the City's system. Operational Evaluation Reports from December 2014, and February 2015, have identified possible causes and corrective measures for the previous elevated TTHM levels, which we encourage the City to continue implementing." -MDEQ

Notification is based on four quarters of test results. Because of last year's test results, the City's *annual* quarterly testing average is not yet below the state's allowable average and the City is required to issue the attached notice (*"Important Information about Your Drinking Water"*).



If you have any questions about this report or would like a test done at your home, free of charge, please call us at 810-787-6537.

Maintaining safe water and improving its quality is a top priority for all of us at the City of Flint, and we apologize for the concerns these notices have raised. We have taken many steps to improve the safety and quality of our water supply and will be taking more. As you may know, we have recently received a series of recommendations from several sources, including a report from international urban water system consultant, Veolia North America. We will be taking further action steps to assure that water remains safe and that water quality is improved, and we will be working with our recently created Citizen Advisory Committee and our Technical Advisory Committee as we progress. Please track our progress on our website cityofflint.com.



City of Flint



IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

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

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, November 20 of 2014, and February 17, 2015). The average of the results at ANY of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the MCL. The standard for TTHMs is 80 micro grams per liter ($\mu\text{g/L}$). The location reporting the highest TTHM level was 105 $\mu\text{g/L}$; thus, our water system exceeds the TTHM MCL.

What should I do?

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

What does this mean?

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

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

What is being done?

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

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

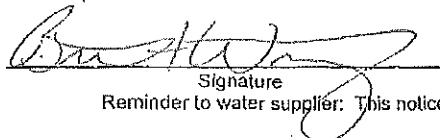
Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by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

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

CERTIFICATION: F2 S3

WSSN: 02310

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



Signature

Plant Supervisor

Title

March 25, 2015

Date Distributed

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

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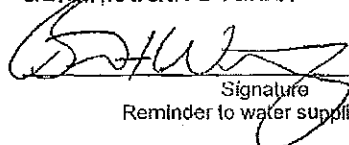
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Signature

SUPERVISOR

Title

4-1-2015

Date Distributed

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U.S. Postal Service™	
CERTIFIED MAIL™ RECEIPT	
(Domestic Mail Only, No Insurance Coverage Provided)	
For delivery information visit our website at www.usps.com	
LANING MI 48909	
OFFICIAL USE	

Postage	\$ 0.98	0503
Certified Fee	\$3.30	18
Return Receipt Fee (Endorsement Required)	\$2.70	APR 10 2015
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 6.98	04/10/2015

Sent To	
Street, Apt. No., or PO Box No.	P.O. 30402
City, State, ZIP+4	
PS Form 3800, August 2006	See Reverse for Instructions

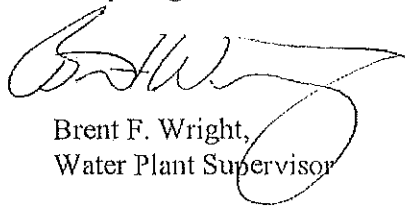
Michael F. Prysby, P.E., District Engineer
Michigan Department of Environmental
Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

Dear Mr. Prysby:

This letter is to inform your office the City of Flint Water Treatment Plant made public the MCL violation for TTHM's, a letter was mailed to all water customers on Wednesday April 1, 2015. The notification letter was also uploaded on the City's website www.cityofflint.com/wp-content/Water-Quality-Update-to-Residents-April-2015.pdf. A copy of the letter is enclosed.

I believe this will satisfy are requirements under administrative rule R 325.10610.

If anything further is necessary, please contact me at here at the plant, 810.787.6537.


Brent F. Wright,
Water Plant Supervisor

cc: File

ARTMENT OF UTILITIES ater Plant & Facilities

Gerald Ambrose
Emergency Manager

Brent Wright
Supervisor

April 10, 2015

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Tuesday, July 28, 2015 1:14 PM
To: Prysby, Mike (DEQ); Scherbarth, John (AG)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

The link below is for Flint's 2015 Consumer Confidence Report (representing 2014 data and the current TTHM numbers), which meets the PN requirements for the 2nd quarter '15 VN. This report was distributed on or before the 7/1/15 deadline.

<https://www.cityofflint.com/wp-content/uploads/CCR-2014.pdf>

Adam

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:02 PM
To: Scherbarth, John (AG)
Cc: Rosenthal, Adam (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,
 Attached is a copy of the 2nd quarter TTH PN that was distributed to Flint city residents around April 1, 2015. Also, included with the PN is further discussion of the TTHM levels and the trend in concentration.

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

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From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:55 PM
To: Howard Croft (hcroft@cityofflint.com)
Subject: City of Flint TTHM Public Notice - April 1, 2015

Howard,

A quick question....the second TTHM public notice that was sent to city residents on or around April 1, 2015 included a Water Quality Update. Were both documents sent out at the same time?

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

Rennaker, Joanne (DEQ)

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 12:51 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Thanks so much for your help. I will wait for your confirmation.

John C. Scherbarth

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:37 PM
To: Scherbarth, John (AG)
Cc: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,

The update accurately states that the results from all eight location were below the maximum contaminate level (MCL) in February's monitoring; however, it re-iterates that the annual quarterly average is still above the state's allowable level – MCL.

I would re-word the last sentence of the narrative to read: The city of Flint will return to compliance with the TTHM MCL after the Locational Running Annual Average (LRAA) no longer exceeds the 80 ug/L MCL at all eight locations. The LRAA is the running annual average of samples collected quarterly at each location.

I will need to confirm with the city as to whether both documents were sent out at the same time.

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

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 12:12 PM
To: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Were these both sent out at the same time?

And, isn't the Water Quality Update inaccurate since the City is not in compliance until the averages for a year are below MCLs?

I want to be certain that the following narrative is correct:

“During February, the detected level has been in an acceptable range at all eight sampling locations. Another sampling occurred during the month of May, and, again, the detected level was found to be in the acceptable range at all sampling locations. However, before the City of Flint can be considered to be in compliance, it must meet the compliance levels for a full year.”

John C. Scherbarth

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 12:02 PM
To: Scherbarth, John (AG)
Cc: Rosenthal, Adam (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John,
 Attached is a copy of the 2nd quarter TTH PN that was distributed to Flint city residents around April 1, 2015. Also, included with the PN is further discussion of the TTHM levels and the trend in concentration.

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

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 11:26 AM
To: Prysby, Mike (DEQ)
Cc: Rosenthal, Adam (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Mike

Can you please send me a PDF version of the notice that the City of Flint sent on or about April 1?

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To: Scherbarth, John (AG)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

thanks,

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

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

From: Busch, Stephen (DEQ)
Sent: Tuesday, June 09, 2015 12:39 PM
To: Howes, Sarah (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)
Cc: Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Attached is a copy of the Violation Notice and Public Notice Template being mailed to the City of Flint by the DEQ Office of Drinking Water and Municipal Assistance regarding an exceedance of the Maximum Contaminant Level (MCL) standard for Total Trihalomethanes at certain locations within the City's drinking water distribution system.

This violation notice is in response to updated monitoring completed in May 2015, which shows the locational running annual average for one of the City's eight compliance sampling locations continues to exceed MCL standard of 0.080 mg/L. It is however, important to note that all individual compliance sample results collected in both May and February were below the 0.080 mg/L levels.

You are being provided an electronic copy of this notice as exceedance of this drinking water standard is expected to generate inquiries from water system customers, news media, and the general public.

Sarah Howes or Maggie Pallone will be informing members of the Michigan legislature.

If you have any questions or would like any additional information, you may contact Michael Prysby, District Engineer, DEQ-ODWMA at 517-290-8817, or you may contact me at the number below.

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

Rennaker, Joanne (DEQ)

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Office of Drinking Water and Municipal Assistance
517 290-8817

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Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

thanks,

Adam Rosenthal, EQA
 MDEQ – Office of Drinking Water and Municipal Assistance
 Lansing District – Constitution Hall 1SW
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To: Howes, Sarah (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)
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Stephen Busch, P.E.
 Lansing and Jackson District Supervisor
 Office of Drinking Water and Municipal Assistance
 MDEQ

517-643-2314

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 28, 2015 11:42 AM
To: 'bwright@cityofflint.com'; Michael Glasgow
Cc: Rosenthal, Adam (DEQ)
Subject: Flint TTHM Public Notice - April 1, 2015

Brent, Michael

Can you send us a copy of the second TTHM public notice that the city distributed to city residents on or about April 1, 2015? This PN would reflect TTHM levels from monitoring through Feb. of 2015. Thanks.

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

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Tuesday, July 28, 2015 11:35 AM
To: Scherbarth, John (AG)
Cc: Prysby, Mike (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

It looks like that is the correct page with a wrong date in the header. A new date of July 1st is for the 2nd PN requested for this year. We will send copies of both PNs

Adam

From: Scherbarth, John (AG)
Sent: Tuesday, July 28, 2015 11:31 AM
To: Rosenthal, Adam (DEQ)
Subject: RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Adam

Page 3 of what you sent to me appears to be page 3 of the March 5 letter. Please resend the complete June 9 letter.

John C. Scherbarth

From: Rosenthal, Adam (DEQ)
Sent: Tuesday, July 28, 2015 11:14 AM
To: Scherbarth, John (AG)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

thanks,

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

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

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Cc: Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)

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If you have any questions or would like any additional information, you may contact Michael Prysby, District Engineer, DEQ-ODWMA at 517-290-8817, or you may contact me at the number below.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

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Follow Up Flag: Follow up
Flag Status: Flagged

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MDEQ
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Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015
Attachments: Flint VN TTHM 6_9_15.pdf

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

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Adam Rosenthal, EQA
 MDEQ – Office of Drinking Water and Municipal Assistance
 Lansing District – Constitution Hall 1SW
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Stephen Busch, P.E.

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

June 9, 2015

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

WSSN: 02310

Dear Mr. Wright:

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

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

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

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

Mr. Brent Wright

2

June 9, 2015

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

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

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

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

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

Mr. Brent Wright

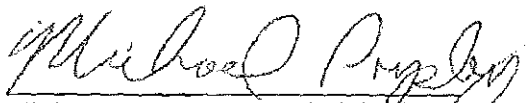
3

March 5, 2015

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

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

Sincerely,



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



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

Enclosure

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

3. Status of Flint

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

<https://www.cityofflint.com/2015/06/01/may-water-testing-results-show-all-locations-are-within-acceptable-limits-for-tthm/>

All samples below the TTHM MCL; one site still has an LRAA above the MCL but decreased from 105 ppb in Feb to 93.5 ppb in May.

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

b. Lead in Flint

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

Miguel provided a brief summary of the high lead results found at the residence of Ms. Leeanne Walters in Flint. Miguel will follow up with a written summary of the work conducted, sample results, and conclusions.

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

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

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

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

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

Thank you!

Jennifer

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

Let us know if there are questions or you need any additional information.

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: Wurfel, Brad (DEQ)
Sent: Friday, July 24, 2015 12:09 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Shekter Smith, Liane (DEQ); Wyant, Dan (DEQ); Pallone, Maggie (DEQ)
Subject: Need upate on lead / copper tests for Flint

Guys, the Flint Ministers met with the Governor's office again last week. They also brought along some folks from the community – a college prof and a GM engineer – who imparted that 80 water tests in Flint have shown high lead levels.

Could use an upate on the January / june testing results, as well as recap of the December testing numbers, and any overview you can offer to edify this conversation.

Call me or email today if possible. Thanks!

b

Brad Wurfel
Communications Director
Michigan Department of Environmental Quality
517-284-6713
517-230-8006 cell



CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
WATER BOARD BUILDING

735 RANDOLPH STREET
DETROIT, MICHIGAN 48226-2830
PHONE 313 • 224 • 4800/224 • 4801
FAX 313 • 224 • 6067

June 10, 1994

To: DWSD Wholesale Customers

RE: EXECUTIVE SUMMARY OF DETROIT'S CORROSION CONTROL STUDY

Enclosed is a copy of the Executive Summary prepared by our consultant, Tucker, Young, Jackson & Hull, detailing work to date on the Corrosion Control Study performed for Detroit and Detroit's wholesale customers.

The EPA required large utilities to test water samples in highest risk homes for lead and copper content in 1992 to determine if the action levels of 15 micrograms per liter and 1.3 milligrams per liter respectively were exceeded. Detroit complied with this requirement and determined that the action level for lead was exceeded in many communities. Therefore, DWSD conducted and continues to conduct a public education program designed to inform consumers how to reduce their exposure to lead.

The EPA further required large water suppliers to determine if their lead could be less corrosive and, if so, the utility was mandated by the Lead and Copper Rule to determine ways the water could be made less corrosive and report their recommendations to the primary agency. For DWSD, the primary agency is the Michigan Department of Public Health (MDPH).

After several years of study, DWSD is forwarding the complete study findings to the MDPH for their consideration. It was concluded that DWSD could reduce the corrosivity of the water in the most cost effective and efficient manner by the addition of ortho-phosphate, specifically in the form of phosphoric acid. The Executive Summary of these findings is being forwarded to you for your information. The MDPH has until the end of December 1994 to consider DWSD's recommendation. In the interim, DWSD plans on conducting a demonstration test of the corrosion control treatment in our distribution system to further assist the MDPH and to further safeguard public health.

Very truly yours,

Irving M. Schuraytz
Irving M. Schuraytz, P.E.

Assistant Director, Water Supply Operations

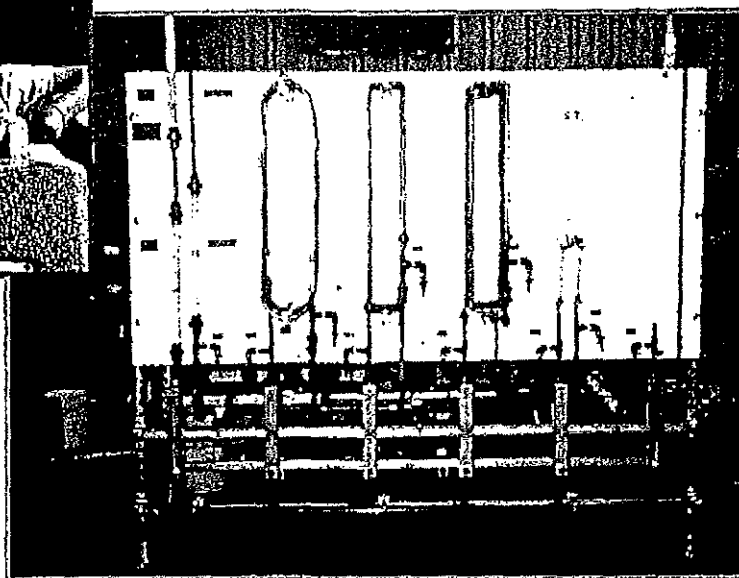
Kathleen Leavey
Kathleen Leavey
Deputy Director

KL/IMS/JH/cs

DENNIS W. ARCHER, MAYOR

Executive Summary

Lead and Copper Corrosion Control Optimization Study



prepared by

Tucker, Young, Jackson, Tull, Inc., in association with
CH2M HILL, INC., and Economic and Engineering Services, Inc.

May 1994



Detroit Water and Sewerage Department

Introduction

As a result of the Safe Drinking Water Act (SDWA) Amendments of 1986, the U.S. Environmental Protection Agency (EPA) published final drinking water regulations for lead and copper in the June 7, 1991, *Federal Register*. Those regulations, known as the Lead and Copper Rule (LCR), require:

- Tap water monitoring, which is a new approach for water utilities
- Treatment optimization for lead and copper corrosion control
- Public education and lead service line removal if utilities exceed preset lead or copper levels

Large utilities, serving populations greater than 50,000, are required to conduct corrosion control studies to demonstrate that they are either already providing optimal treatment or to determine optimal treatment for their system.

DWSD made necessary public notices and embarked on studies to develop optimal treatment solutions.

In response to the regulations, the Detroit Water and Sewerage Department (DWSD) conducted two rounds of monitoring at home water taps for lead and copper and throughout the distribution systems for other water quality parameters. Monitoring was a cooperative effort between the DWSD, wholesale water customers, and the Michigan Department of Public Health (MDPH). Copper levels were well below EPA limits. Lead levels, however, exceeded EPA action levels

(ALs) and DWSD made necessary public notices and embarked on studies to develop optimal treatment solutions.

Lead exposure sources for humans include air, food, dust, paint, and drinking water. Elevated lead levels in blood have been associated with adverse health effects in humans. Federal health authorities have many programs to reduce lead exposure including low-lead gasoline and reduced lead content in paint. Although drinking water may not be the major source of lead, reducing lead levels in drinking water will have a positive health benefit. An additional benefit of corrosion control is prolonged life for water distribution pipes and home plumbing. This results in lower costs for water utilities and their customers.

In March 1992, the DWSD contracted with Tucker, Young, Jackson, Tull, Inc. (TYJT), in association with CH2M HILL, INC., and Economic and Engineering Services, Inc. (EES), to perform a lead and copper corrosion control study. The purpose of the study was to determine the optimal approach for reducing lead and copper concentrations in DWSD drinking water without adversely affecting other water quality characteristics. Major tasks in this study were to:

- Evaluate existing water quality data, existing distribution system pipe materials and the results of lead and copper sampling
- Identify and analyze feasible and practical treatment methods to reduce lead and copper corrosion (desktop analysis)
- Design and construct a pipe-loop testing apparatus to evaluate treatment alternatives identified in the desktop analysis

- Operate the pipe loops for 1 year to evaluate selected corrosion control treatments on different pipe materials
- Evaluate the effectiveness and feasibility of the tested treatment alternatives in reducing lead and copper concentrations
- Recommend an optimum lead corrosion control treatment
- Develop an implementation plan for full-scale corrosion control facilities

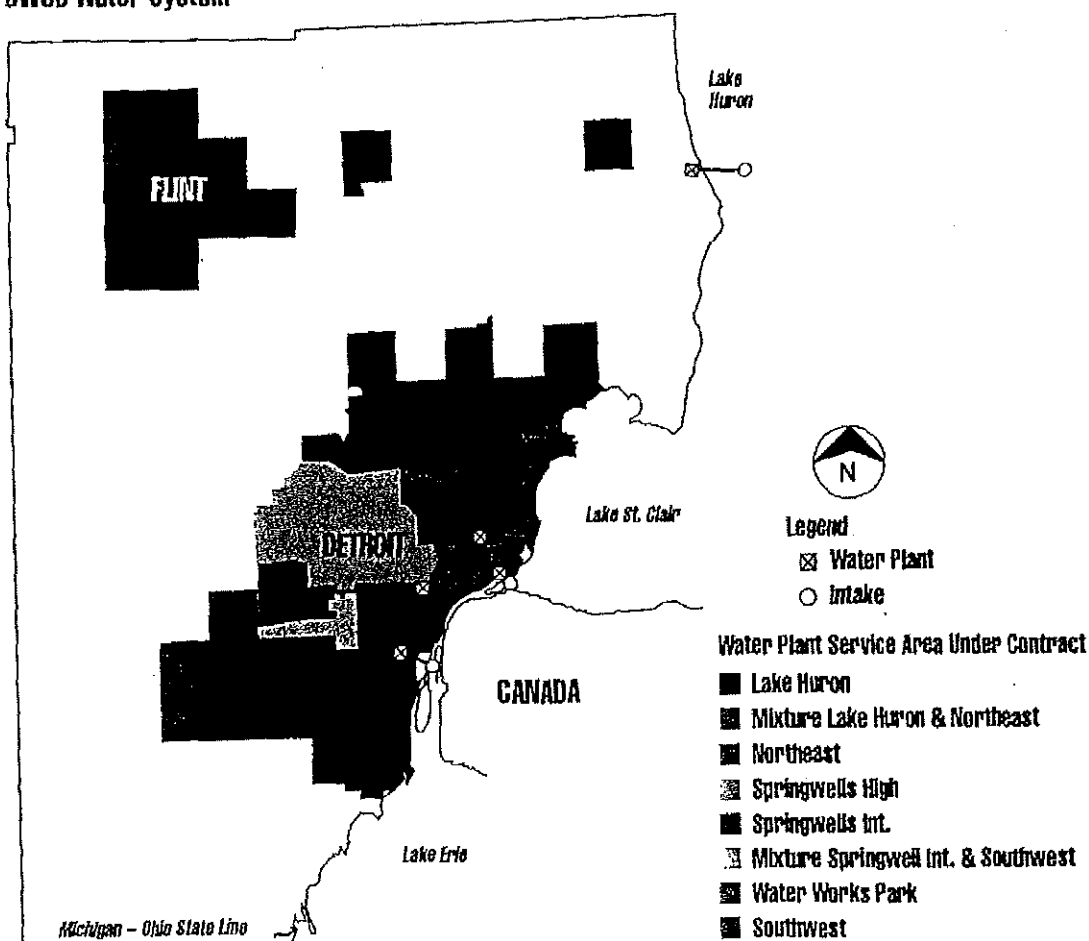
This report presents the results of the DWSD Lead and Copper Corrosion Control Optimization Study.

Existing Conditions

The DWSD obtains water from three intakes. Two of these, the Belle Isle and the Fighting Island Intakes, take water from the Detroit River. The third intake is on Lake Huron. Water is treated at five water treatment plants (WTPs) including the Water Works Park, Southwest, Springwells, Northeast, and Lake Huron WTPs. The water system is shown in Figure ES-1. Treated water from the 5 WTPs is distributed to the City of Detroit and 119 wholesale water customer systems. The DWSD water system serves about 4 million people.

Water leaving the WTPs is of good quality and considered moderately

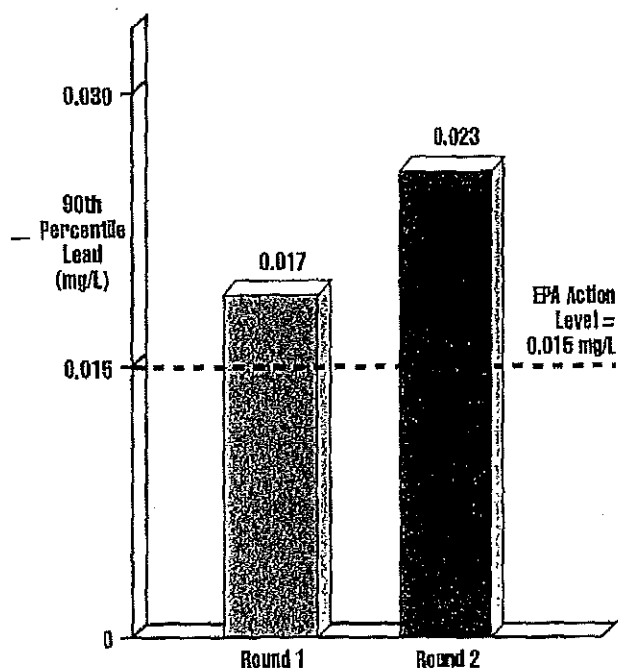
Figure ES-1
DWSD Water System



corrosive. For example, pH from the five WTPs averages 7.4, alkalinity averages 76 mg/L (CaCO_3), and hardness averages 100 mg/L (CaCO_3). Nevertheless, some increase in lead and copper is resulting from the corrosive action of the water, primarily on service pipe and household plumbing. The main sources of lead are 50:50 lead/tin solder, brass containing lead used in faucets, and lead service lines and plumbing.

The regulation lead AL is 0.015 mg/L at the 90th percentile in home water taps. During the LCR Compliance Monitoring conducted in 1992, DWSD's 90th percentile lead concentration was 0.017 mg/L in the first round and 0.023 mg/L in the second round of sampling (Figure ES-2). Looking at the data in a slightly different manner, 35 to 37 percent of the 119 purveyor water systems exceeded the AL for lead.

Figure ES-2
LCR Compliance Monitoring Results for Lead



For copper, the 90th percentile concentrations were 0.34 and 0.19 mg/L for two rounds of sampling—well below the copper AL of 1.3 mg/L (Figure ES-3). Lead uptake, therefore, is the major concern within the DWSD water system.

Determining the optimal lead control treatment is essential; it is the objective of conducting this corrosion control study. Further, there are an estimated 200,000 lead service lines (LSLs) in DWSD's direct service area and possibly more in areas served by wholesale customers. After corrosion treatment is optimized, the possibility exists that lead ALs may still be over 0.015 mg/L at the 90th percentile. Should this occur, the DWSD would need to embark on a removal program for LSLs, which could cost between \$300 and \$800 million.

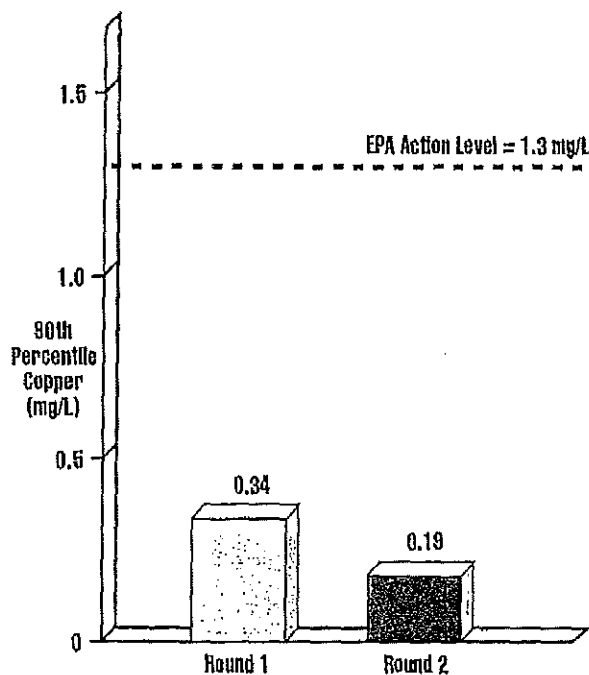
Desktop Analysis

To reduce the number of chemicals for long-term testing, a screening analysis was performed using desktop techniques recommended by U.S. EPA. Lead corrosion control treatment methods examined for their applicability to DWSD are as follows:

- Polyphosphates
- Orthophosphates
- Zinc orthophosphate
- Polyphosphate/orthophosphate blends
- Silicates
- pH adjustment
- Alkalinity adjustment
- Calcium adjustment

The main criteria for selecting a lead corrosion control method is performance for lead uptake reduction. Lead corrosion control methods were also evaluated

Figure ES-3
LCR Compliance Monitoring Results for Copper



based on effects on other drinking water regulations, industrial water users, wastewater treatment, water quality, water treatment operations, consecutive water systems, and multiple sources of supply and treatment.

Based on this evaluation, the following chemical treatments were eliminated from consideration for pipe-loop testing.

- **Polyphosphates.** These products are primarily used to sequester iron, calcium, and manganese and may actually do more to promote lead corrosion than to prevent it.
- **Polyphosphate/Orthophosphate Blends.** These products have not been proven to be more effective than orthophosphates alone for lead reduction, and their proprietary chemical composition makes selection of the optimum product difficult.

- **Silicates.** Sodium silicate inhibitors require a high dosage for lead control and, based on a survey of major industries, would have significant adverse effects on industrial water users.
- **Alkalinity Adjustment.** This technique would have marginal performance for lead reduction based on DWSD water quality and would be impractical for a system the size of DWSD.
- **Calcium Adjustment to Deposit a Calcium Carbonate Layer.** This technique is not a proven method for lead reduction, and would be difficult to produce a uniform layer throughout a distribution system the size of DWSD. Calcium carbonate deposition, however, can occur when pH is raised for lead reduction. This situation is addressed under the pH adjustment alternative.

Lead corrosion control treatment methods applicable for DWSD water are as follows:

- **Orthophosphates.** These products have been shown to be an effective means of lead reduction for water similar to that of the DWSD.
- **Zinc Orthophosphate.** These products are also a proven method of lead reduction, although there is concern about zinc in industrial water and wastewater.
- **pH adjustment.** This technique is also a proven method of reducing lead solubility, although higher pHs affect some industrial users and can increase calcium carbonate deposition.

A survey of 16 Great Lakes area water utilities using water of similar quality to that of DWSD demonstrated the effectiveness of orthophosphate, zinc orthophosphate, and pH adjustment in reducing lead concentrations at the consumers' taps. Those treatment methods, therefore, were retained for further testing in the pipe-loop apparatus.

Pipe-Loop Testing

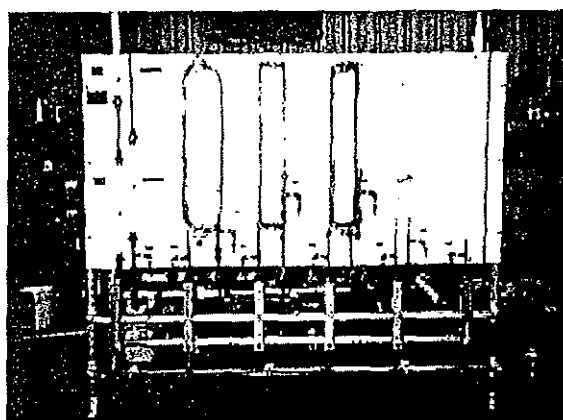
Based on the desktop analysis, it was concluded that the following treatments would be tested in the pipe loops:

- Adjusting pH to 8.1 using sodium hydroxide
- Adjusting pH to 8.7 using sodium hydroxide
- Adding zinc orthophosphate at doses of 0.4 mg/L for zinc and phosphorous (as P)
- Adding orthophosphate using phosphoric acid at a dose of 0.4 mg/L as P

Pipe-loop testing produces information on the corrosion control treatment most likely to effectively reduce lead levels.

It is important to understand that pipe-loop testing is conducted to provide information on the **relative effectiveness** of corrosion control treatments. The results cannot be used to predict actual lead levels that may occur at customers' taps in the water system. Pipe-loop testing, however, produces information on the corrosion control treatment most likely to effectively reduce lead levels and is an approved optimization technique.

Figure ES-4
Typical Testing Apparatus



A pilot-scale testing apparatus was designed and constructed to test each of the treatment techniques on different pipe materials. Five pipe-loop racks were constructed: one for each of the four methods and another for control (no treatment provided). Each pipe-loop rack included one new lead pipe loop, two identical copper pipe loops with lead soldered joints, one brass tester, and one section of old lead pipe. Three weight loss testers were also included for measuring corrosion rates of steel, galvanized steel, and copper. A typical testing apparatus is shown in Figure ES-4.

The pipe-loop facility was installed in the lower level of the Water Works Park High Service Pump Station and operated from January to November, 1993. After an initial period of passivation, water samples were collected on a weekly basis and analyzed for lead, copper, and zinc. The 1-liter water samples were taken after the water had been in contact with the pipe loop materials for 8 hours. This was done to represent the first-draw sampling required by the LCR. Additional sampling included daily monitoring for pH, chemical doses, and temperature. Disinfection

by-products (DBPs) and pipe insert weight loss were done quarterly. Flavor profile analyses to assess any changes in tastes or odors were run monthly.

Results of pilot testing indicated:

- The inhibitor treatments, zinc orthophosphate, and phosphoric acid are statistically better than the untreated control for both old and new lead piping (Figure ES-5).
- For lead solder and copper piping, the median lead levels were lowest in the water with inhibitors (zinc

orthophosphate and phosphoric acid), but only the phosphoric acid results were statistically better than the other loops (Figure ES-6).

- For brass, the results indicated that the treatments were no better than the control; however, lead levels were near the detection limit in the brass testers (Figure ES-6).
- Zinc orthophosphate and phosphoric acid were also found to be the most effective treatments in reducing copper (Figure ES-7).

Figure ES-5
Relative Lead Levels from Lead Pipe

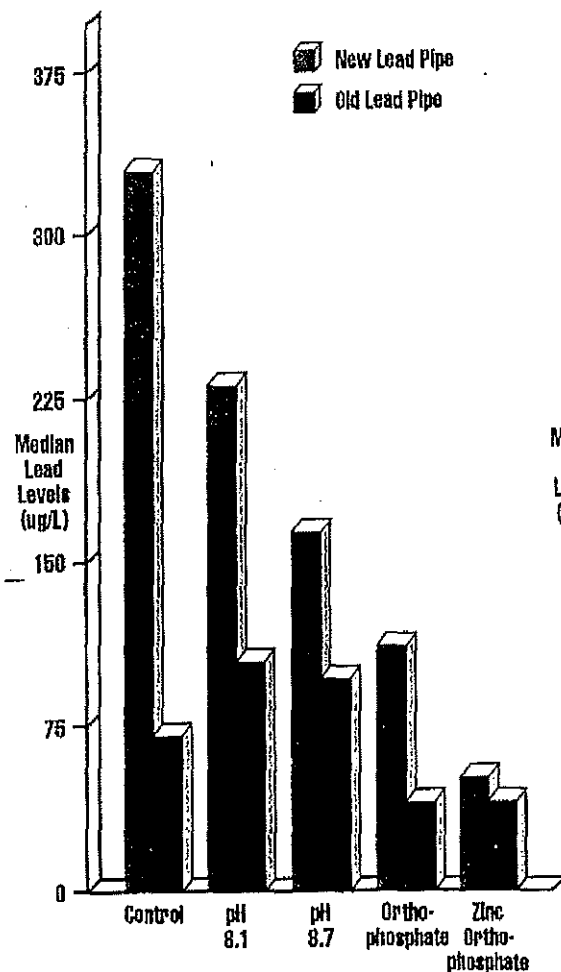


Figure ES-6
Relative Lead Levels from Soldered Copper and Brass

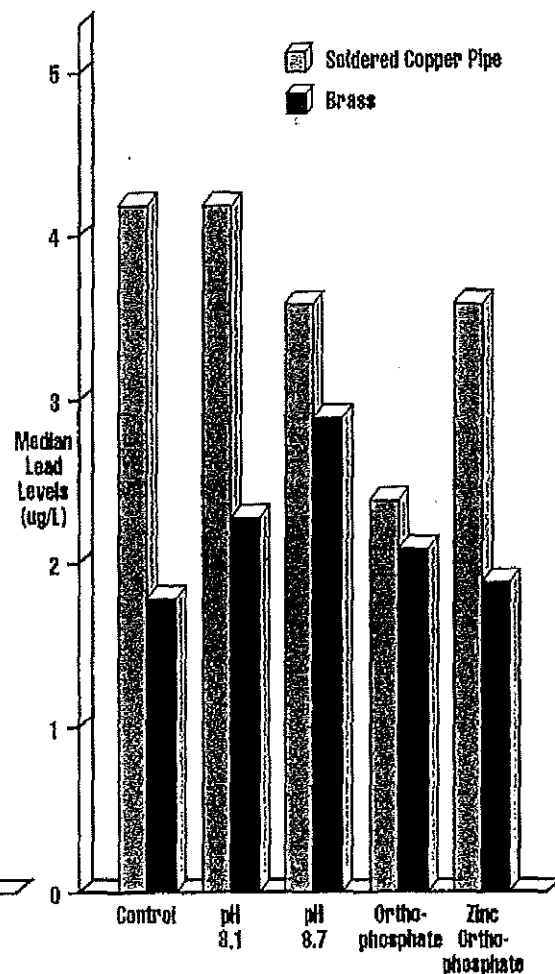
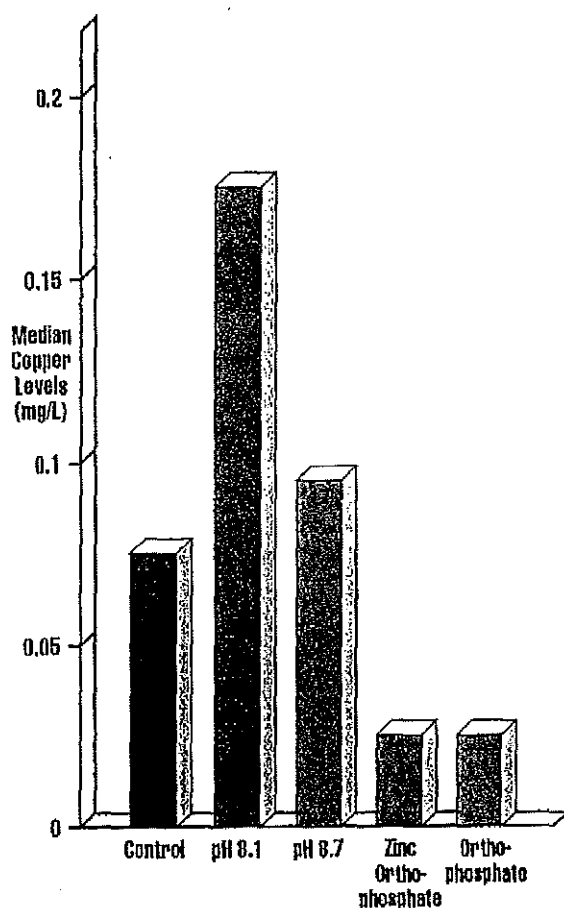


Figure ES-7
Relative Copper Levels from Copper Pipe



- DBPs were increased for the pH adjustment treatments as expected. The DBPs formed as a result of this increase, however, did not exceed EPA-proposed limits. The orthophosphate and zinc orthophosphate did not increase DBPs.
- None of the corrosion control treatments had an adverse effect on the taste and odor of the water produced.

Evaluating Corrosion Control Treatment

The four corrosion control treatments tested in the pipe loops were evaluated based on the following criteria:

- Performance for lead uptake reduction
- Feasibility of implementation within regulatory and functional constraints
- Reliability in terms of operational consistency and continuous corrosion control protection
- Cost

Pipe-loop data analyses indicated orthophosphate and zinc orthophosphate are most likely to yield the best results for lead reduction. pH adjustment was not as effective for lead control. Orthophosphate and zinc orthophosphate were effective at reducing copper levels.

A feasibility analysis indicated that industrial water users would be affected adversely by zinc or a higher water pH. Wastewater operations would be adversely affected by zinc and orthophosphates loadings. There were no major effects of corrosion control treatment on drinking water regulations. pH adjustment could, however, decrease disinfection effectiveness and increase DBP formation.

The reliability of zinc orthophosphate and sodium hydroxide chemicals is less than would be expected for orthophosphates. Zinc orthophosphate is a proprietary chemical with price and supply constraints. Sodium hydroxide availability and price depend on market conditions. Orthophosphate (phosphoric acid) is available as a generic chemical and is commonly used in the food and beverage

age industry; therefore, price and availability are more stable. From a WTP-operations standpoint, pH adjustment is less reliable because pH can change with raw water quality and treatment conditions.

The chemical cost of each treatment alternative is shown in Figure ES-8. Phosphoric acid addition is less than half the cost of pH adjustment to 8.1, the next lowest chemical cost. This represents an

average cost savings of about \$2,400 per day. Phosphoric acid could save the DWSD about \$10 million in present worth in the next 20 years compared to the next lowest cost alternative.

Selecting Corrosion Control Treatment

The relative ranking of alternatives for the four criteria (performance, feasibility, reliability, cost) is summarized in Figure ES-9. Values of 1 through 4 were assigned for each treatment alternative in each criteria category (1 was best; 4 worst). Because performance for lead reduction was the main criteria, it was given a weight of 2. Each of the other criteria was given a weight of 1.

Orthophosphates were ranked highest overall. Zinc orthophosphate was second, mainly because of its adverse effects on industry, wastewater plant operations, and higher costs. pH adjustment was ranked lowest because it is less effective for lead reduction, less reliable, and demonstrates more adverse effects on industry and drinking water regulatory compliance.

Orthophosphates were selected as the optimal treatment alternative for full-scale lead corrosion control.

Based on corrosion control theory, comparison with analogous water systems, and the extensive pilot plant studies, orthophosphates were selected as the optimal treatment alternative for full-scale lead corrosion control.

Figure ES-8
Treatment Alternatives Costs

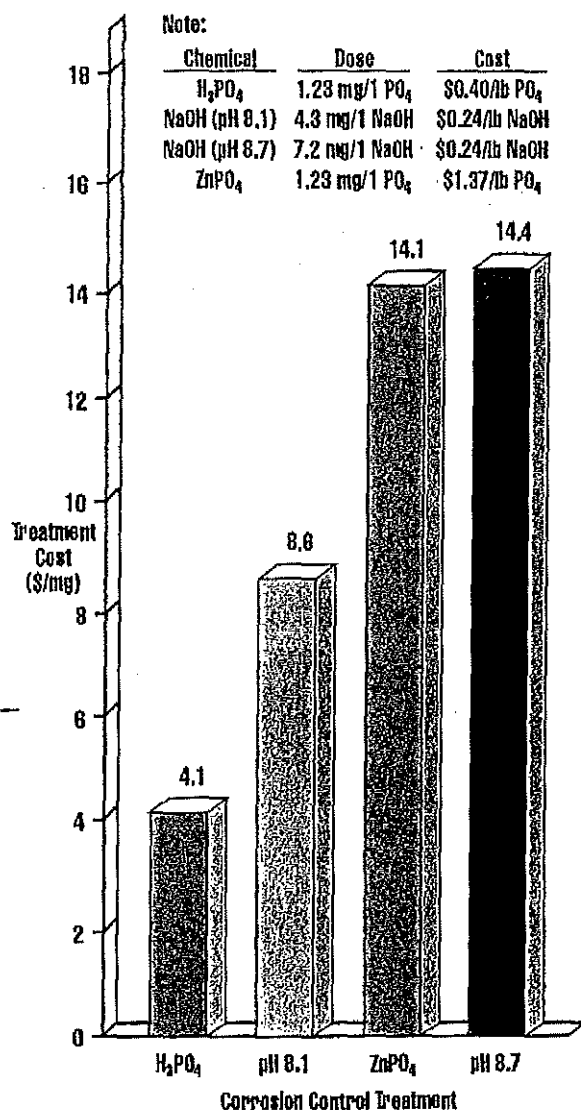


Figure ES-9
Alternatives Ranking
by Criteria

Treatment	Evaluation Criteria				Weighted
	Performance wt.= 2	Feasibility wt.= 1	Reliability wt.= 1	Cost wt.= 1	
Phosphoric Acid	2	1	1	1	7
Zinc Orthophosphate	1	4	2	3	11
pH 8.1	4	2	3	2	15
pH 8.7	3	3	4	4	17

Legend: 1 = Best; 4 = Worst

Phosphoric acid is the recommended form of adding orthophosphate. It is a generic chemical and can be bid competitively. It does not add sodium to the water and costs less than any other form of orthophosphate. In addition, the finished water pH is already in the optimal range for lead solubility reduction by phosphates, so pH adjustment is not required.

The recommended dose of phosphoric acid is 1.2 mg/L as P for initial passivation and a sustained dose of 0.4 mg/L as P for maintaining control of lead uptake. Values may be adjusted based on full-scale results.

Full-Scale Implementation

The LCR requires optimal corrosion control treatment installation by January 1, 1997. To meet this deadline, the implementation schedule in Figure ES-10 is proposed. The first element of implementation is to conduct full-scale demonstration testing in the distribution system served

by one of the WTPs before installing chemical feed facilities in the other four plants. Operation of lead corrosion control facilities at all plants is planned for May 1996. This will provide additional time to optimize the system before lead monitoring is required in 1997.

The chemical equipment required for each WTP is summarized in Table ES-1. A schematic of a typical liquid chemical system is shown in Figure ES-11.

The cost of lead corrosion control chemicals is estimated to be about \$0.87 per year per household.

The estimated capital cost for corrosion control facilities at the five WTPs is \$3,740,000. The estimated cost of chemicals is \$868,000 per year. The cost of lead corrosion control chemicals is estimated to be about \$0.87 per year per household.

A monitoring program will be established before and after corrosion control treatment is implemented to determine performance for lead reduction and effects on other water quality parameters. If lead is reduced to below the EPA AL of 0.015 mg/L for two consecutive 6-month monitoring periods, other methods

of lead reduction, such as removing lead service lines, will not be required.

If the lead AL is still exceeded after optimization and stabilization, a program for lead service line removal should be developed in addition to an ongoing public education program.

Operation of lead corrosion control facilities at all plants is planned for May 1996.

**Figure ES-10
Implementation Schedule**

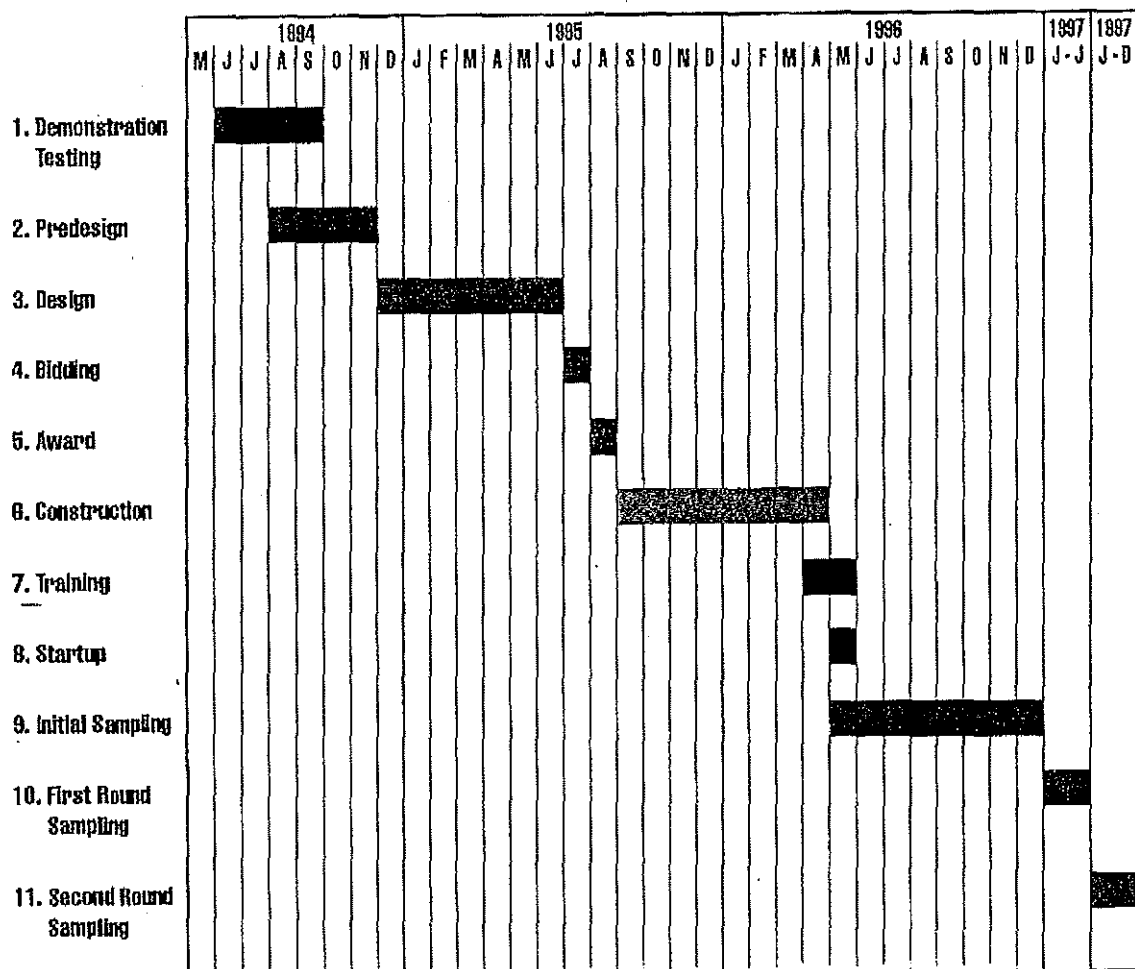
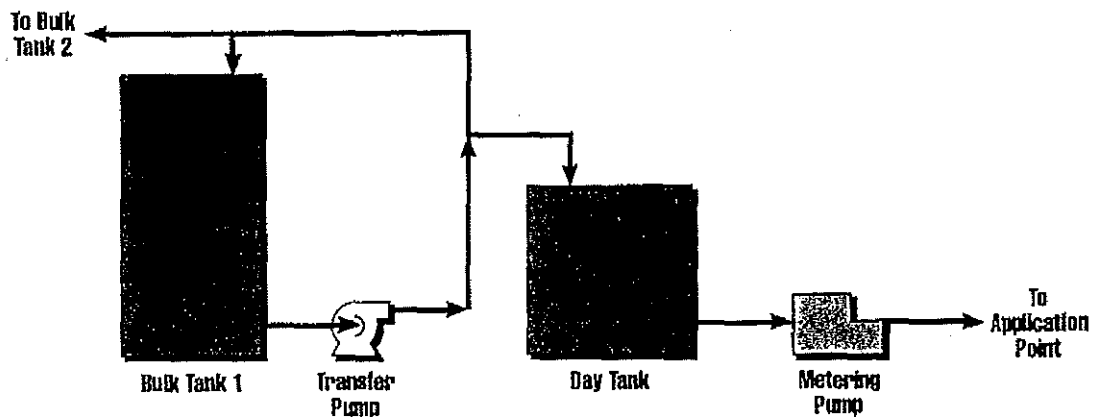


Table ES-1
Chemical Equipment Summary

	Southwest Water Plant	Water Works Park Water Plant	Northeast Water Plant	Springwells Water Plant	Lake Huron Water Plant
Number of bulk tanks	2	2	2	2	2
Bulk tank capacity, each (gal)	4,000	4,000	4,000	6,000	4,000
Number of day tanks	1	1	1	1	1
Day tank capacity (gal)	200	200	200	400	200
Number of feeders	3	3	3	3	3
Feeder capacity, each (gpd)	1 @ 200 2 @ 650	1 @ 300 2 @ 650	1 @ 250 2 @ 800	1 @ 600 2 @ 1,500	1 @ 350 2 @ 650
Number of transfer pumps	2	2	2	2	2
Transfer pump capacity each (gpm)	15	15	15	30	15

Figure ES-11
Liquid Chemical System Schematic



STATE OF MICHIGAN



JOHN ENGLER, GOVERNOR

DEPARTMENT OF PUBLIC HEALTH

3423 N. LOGAN/MARTIN L. KING JR., BLVD.

P.O. BOX 30195, LANSING, MICHIGAN 48909

Vernice Davis Anthony, Director

March 15, 1993

City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

WSSN: 2310 ✓

Attention: Mr. Charles Smith, Utilities Superintendent

Subject: Lead/Copper Monitoring

Gentlemen:

We have reviewed the results of the second round of the lead and copper monitoring completed for your water supply for the period of July 1, 1992, through December 31, 1992. The samples were collected and analyzed to comply with the U.S. Environmental Protection Agency's Lead and Copper Regulation. The action levels specified in the regulation require that the 90th percentile results from the distribution system samples for lead and copper not exceed 15 and 1300 ug/l, respectively.

Since the 90th percentile lead level for your water system is 14.4 ug/l, the lead action level of 15 ug/l has not been exceeded. Also, the 90th percentile copper level was significantly below the copper action level of 1300 ug/l. This means that your water system has met both action levels for the first two monitoring periods.

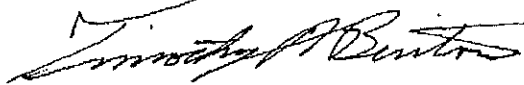
Although many of the Detroit Water and Sewerage Department (DWSD) customers have met the action levels, DWSD is required to conduct a study to determine whether their water treatment processes can be improved to further reduce corrosion. The study is to be completed by July 1, 1994, and any recommended treatment modifications must be in place by January 1, 1997.

City of Flint
Page 2
March 15, 1993

Further monitoring of your water system for lead and copper will not be required until the DWSD study is complete and any additional corrosion control treatment has begun. We will inform you when monitoring is again required. This may be as late as January 1997.

If you have any questions, please call me at (517) 335-8309.

Sincerely,

A handwritten signature in dark ink, appearing to read "Timothy A. Benton". The signature is fluid and cursive, with the first name "Timothy" being more prominent.

Timothy A. Benton, P.E.
District Engineer
Division of Water Supply
Bureau of Environmental and
Occupational Health

TAB:im

cc: John Weisenberger, Water Plant Supervisor
cc: Genesee County Health Department

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Friday, July 24, 2015 12:09 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Cc: Shekter Smith, Liane (DEQ); Wyant, Dan (DEQ); Pallone, Maggie (DEQ)
Subject: Need upate on lead / copper tests for Flint

Guys, the Flint Ministers met with the Governor's office again last week. They also brought along some folks from the community – a college prof and a GM engineer – who imparted that 80 water tests in Flint have shown high lead levels.

Could use an upate on the January / june testing results, as well as recap of the December testing numbers, and any overview you can offer to edify this conversation.

Call me or email today if possible. Thanks!

b

Brad Wurfel
Communications Director
Michigan Department of Environmental Quality
517-284-6713
517-230-8006 cell

Rennaker, Joanne (DEQ)

From: Howard Croft <hcroft@cityofflint.com>
Sent: Tuesday, July 21, 2015 8:03 AM
To: Laura Sullivan
Cc: gdn2@aol.com; bwright@cityofflint.com; dwalling@cityofflint.com; donna.cole@genesys.org; gambrose@cityofflint.com; jhenry@gchd.us; jllorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; ksmith@flint.org; larry.koehler@mcc.edu; mglasgow@cityofflint.com; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; jwgreen@lan-inc.com; mike49@sargentstitle.com
Subject: Re: Water Quality Update

Team,

The following are responses to a few questions that have been asked recently;

1. Will the Granulated Activated Carbon remain in use affect with the new water supply form Lake Huron?

No, The main purpose of the GAC is to remove Total Organic Carbon (TOC) from the water. The water from Lake Huron is expected to have a much lower TOC than river water and we do not expect to need the filters to control TTHM. We will however be performing testing on the water supply prior to introducing it into the distribution system and if the the TTHM trend is higher than expected we will reevaluate this decision.

2. Will KWA water be mixed with Flint river water?

No, There are no plans to co-mingle the two water sources once KWA arrives. The average water usage in the City has been fairly consistent over the last decade at approximately 12 million gallons a Day. Main breaks have caused this number to fluctuate but the leak detection service should point out any integrity breaches in the system. The engineering report recommended that the City purchase 18 MGD of capacity from the KWA which we agreed with and that is the contractual capacity that Flint owns.

There is however excess capacity within the KWA system that would allow us to meet the domestic demand if it were to peak above the purchased 18 MGD. If this scenario were realized, the City would purchase this excess capacity from Genesee County.

The Flint River will still serve as a permanent backup supply for the City therefore we constructed the infrastructure to allow us to introduce the water into the system very quickly.

Please continue to forward any questions that arise.

Thank you,

On Mon, Jul 20, 2015 at 10:39 PM, Laura Sullivan <dr.laura2@gmail.com> wrote:

My reading of planning documents for the KWA suggests that once untreated water arrives in Flint, some of it will be sold to GM. Depending on residential water need, it will sometimes be necessary to add water from the Flint River to the remaining untreated KWA water prior to treatment for distribution to residents. Given this, it seems critical that filtration through GAC be considered permanent.

Veolia is pursuing privatization of Great Lakes water, and they specifically recommended that GAC be installed inline when making their report to Flint in February.

Laura Sullivan

On Wednesday, July 15, 2015, <gdn2@aol.com> wrote:
Hello Howard,

Would you share with us whether the Granulated Activated Carbon system will remain in affect with the new water supply from Port Huron for the city of Flint (and possibly the county)? A patient of mine from Flushing asked and I could not answer. It would seem to be an excellent idea both from the standpoint of decreased toxic chemical/metal exposure, taste and safety of the citizens it could serve.

Thank you,

Gerald Natzke DO FAAEM
GCMS Board Representative

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

From: Howard Croft <hcroft@cityofflint.com>

To: Laura Sullivan <dr.laura2@gmail.com>

Cc: Brent Wright <bwright@cityofflint.com>; Dayne Walling <dwalling@cityofflint.com>; donna. cole <donna.cole@genesys.org>; gdn2 <gdn2@aol.com>; Gerald Ambrose <gambrose@cityofflint.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwws.com>; Kirk Smith <ksmith@flint.org>; Larry Koehler <larry.koehler@mcc.edu>; Michael Glasgow <mglasgow@cityofflint.com>; Michael Wright <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo <rosejo@msu.edu>; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Warren Green <jwgreen@lan-inc.com>; Michael Sargent <mike49@sargentstitle.com>

Sent: Fri, Jun 26, 2015 3:41 pm

Subject: Re: Water Quality Update

As a follow up to this afternoon's email, I am answering several questions that have subsequently been asked.

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Please forward me any additional questions that may arise.

Thank you,

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What is the identity of the filter media? Is it GAC?

Yours truly,
L Sullivan

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The installation of new filter media at the water plant which is designed to greatly reduce the TTHM level in the plant is ahead of schedule and is expected to be installed by mid-July. The DEQ has approved the design and actual testing by the vendor over the past two weeks has verified that the selected media should work. **This is expected to have an immediate impact on TTHM levels.**

In addition to the filter installation, we have engaged in increased valve exercising over the last two months and have checked over half of the 7,000 valves in the system. The valve turning has a tendency to result in temporary water discoloration but increases the overall water circulation and identifies areas where valves are inoperable.

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I will email everyone when we schedule the next TAC team meeting which we have currently targeted for mid-August.

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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

--

Laura L. Sullivan, Ph. D.

3101 Hawthorne Drive

Flint, Michigan 48503

dr.laura2@gmail.com

Human(kind). Be both.

--

Howard Croft

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hcroft@cityofflint.com

Rennaker, Joanne (DEQ)

From: Laura Sullivan <dr.laura2@gmail.com>
Sent: Monday, July 20, 2015 10:40 PM
To: gdn2@aol.com
Cc: hcroft@cityofflint.com; bwright@cityofflint.com; dwalling@cityofflint.com; donna.cole@genesys.org; gambrose@cityofflint.com; jhenry@gchd.us; jllorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; ksmith@flint.org; larry.koehler@mcc.edu; mglasgow@cityofflint.com; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; jwgreen@lan-inc.com; mike49@sargentstitle.com
Subject: Re: Water Quality Update

My reading of planning documents for the KWA suggests that once untreated water arrives in Flint, some of it will be sold to GM. Depending on residential water need, it will sometimes be necessary to add water from the Flint River to the remaining untreated KWA water prior to treatment for distribution to residents. Given this, it seems critical that filtration through GAC be considered permanent.

Veolia is pursuing privatization of Great Lakes water, and they specifically recommended that GAC be installed inline when making their report to Flint in February.

Laura Sullivan

On Wednesday, July 15, 2015, <gdn2@aol.com> wrote:
Hello Howard,

Would you share with us whether the Granulated Activated Carbon system will remain in affect with the new water supply from Port Huron for the city of Flint (and possibly the county)? A patient of mine from Flushing asked and I could not answer. It would seem to be an excellent idea both from the standpoint of decreased toxic chemical/metal exposure, taste and safety of the citizens it could serve.

Thank you,

Gerald Natzke DO FAAEM
GCMS Board Representative

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To: Laura Sullivan <dr.laura2@gmail.com>
Cc: Brent Wright <bwright@cityofflint.com>; Dayne Walling <dwalling@cityofflint.com>; donna.cole <donna.cole@genesys.org>; gdn2 <gdn2@aol.com>; Gerald Ambrose <gambrose@cityofflint.com>; Howard Croft <hcroft@cityofflint.com>; James Henry <jhenry@gchd.us>; Jason Lorenz <jlorenz@cityofflint.com>; jmikewright <jmikewright@yahoo.com>; JoAnne Herman <jherman@genesys.org>; John O'Brien <jfobrien@gcdcwws.com>; Kirk Smith <ksmith@flint.org>; larry.koehler <larry.koehler@mcc.edu>; Michael Glasgow <mglasgow@cityofflint.com>; Michael Wright <Wright.Michael@epa.gov>; Mike Lane <mjlane@umflint.edu>; Mike Prysby (DEQ) <prysbym@michigan.gov>; Natasha Henderson <nhenderson@cityofflint.com>; Norb Birchmeier <nbirchm1@hurleymc.com>; Pete Levine <plevine@gcms.org>; Robert Bincsik <rbincsik@cityofflint.com>; rosejo <rosejo@msu.edu>; Russell Hudson <Russell.Hudson@mclaren.org>; Samir Matta <SFMatta@lan-inc.com>; Warren Green <jwgreen@lan-inc.com>; Michael Sargent <mike49@sargentstitle.com>

Sent: Fri, Jun 26, 2015 3:41 pm
 Subject: Re: Water Quality Update

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Rennaker, Joanne (DEQ)

From: gdn2@aol.com
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To: hcroft@cityofflint.com; dr.laura2@gmail.com
Cc: bwright@cityofflint.com; dwalling@cityofflint.com; donna.cole@genesys.org; gambrose@cityofflint.com; jhenry@gchd.us; jllorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; ksmith@flint.org; larry.koehler@mcc.edu; mglasgow@cityofflint.com; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; jwgreen@lan-inc.com; mike49@sargentstitle.com
Subject: Re: Water Quality Update

Hello Howard,
 As I haven't heard anything back, I am resending this inquiry.
 Thanks,
 Gerald Natzke DO

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

From: gdn2
To: hcroft ; dr.laura2
Cc: bwright ; dwalling ; donna.cole ; gambrose ; jhenry ; jllorenz ; jmikewright ; jherman ; jfobrien ; ksmith ; larry.koehler ; mglasgow ; Wright.Michael ; mjlane ; prysbym ; nhenderson ; nbirchm1 ; plevine ; rbincsik ; rosejo ; Russell.Hudson ; SFMatta ; jwgreen ; mike49
Sent: Wed, Jul 15, 2015 7:55 pm
Subject: Re: Water Quality Update

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Rennaker, Joanne (DEQ)

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

68 samples collected by 6/30/15.

90th = 11.4 ppb with 6 samples > AL.

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

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Thursday, July 16, 2015 11:04 AM
To: Benzie, Richard (DEQ); Rosenthal, Adam (DEQ); Prysby, Mike (DEQ)
Subject: RE: TTHMs in Flint

I think it is important to point out that the standard is based on water representative of what is in the public distribution system, not site plumbing systems. I had a similar discussion with UofM Flint about levels analyzed in their plumbing system. While the MCLG's for the various forms is in some cases 0, my understanding is that exposure at 80 ppb is not directly tied to specific health effects, but rather what is essentially feasible for water systems to achieve at the current time while balancing the need for disinfection.

Per EPA,

EPA has regulated DBPs since 1979 to address health risks posed by a potential association between chlorinated drinking water and cancer, particularly bladder cancer. **Current reproductive and developmental health effects data do not support a conclusion at this time as to whether exposure to chlorinated drinking water or disinfection byproducts causes adverse developmental or reproductive health effects, but do support a potential health concern. Although uncertain, the combined health data warrant EPA's promulgation of the Stage 2 Disinfection Byproduct Rule to provide an incremental step towards mitigating potential risks.**

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

From: Benzie, Richard (DEQ)
Sent: Wednesday, July 15, 2015 1:25 PM
To: Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: TTHMs in Flint

Just had a call from a resident of Flint whose neighbor was told yesterday by the city to not drink the water because the TTHM level at her home was 95 ppb. The caller wanted to know if animals should be consuming the water. I told her she would have to consult with a toxicologist or someone familiar with veterinary medicine. I told her animals are less susceptible to some contaminants but more so to others, but as engineers and analysts, we were not the ones that would make that decision – we just pass it on if we find out.

She asked about other TTHM sampling locations and where they were in the city. I told her to contact one of you, starting with Adam.

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

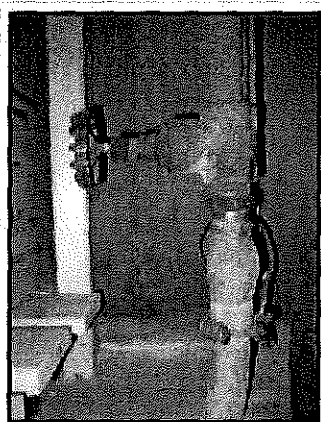
phone: (312) 886-2406

fax: 312-692-2132

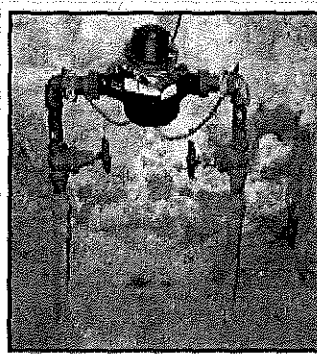
What do lead service lines look like?



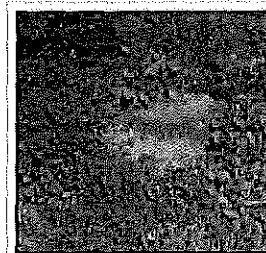
Lead service lines are generally a dull gray color and are very soft. You can identify them easily by carefully scratching with a key. If the pipe is made of lead, the area you've scratched will turn a bright silver color. Do not use a knife or other sharp instrument and take care not to puncture a hole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



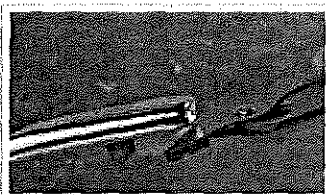
Lead service lines often end just inside the front or side wall of the home, but may extend further into the building as shown, where the lead service line comes out of the basement floor to the water meter and then back into the floor, continuing further into the building.



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

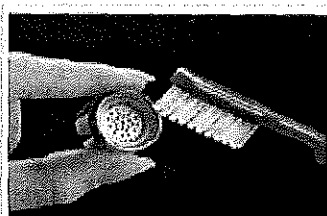
Many taps have an aerator as part of the faucet assembly. Aerator screens are not intended to remove contaminants in water, but may trap sediment or debris as water passes through the faucet. Lead-bearing sediment may end up in drinking water from physical corrosion of lead solder and can build up in 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, screw 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: gdn2@aol.com
Sent: Wednesday, July 15, 2015 8:56 PM
To: hcroft@cityofflint.com; dr.laura2@gmail.com
Cc: bwright@cityofflint.com; dwalling@cityofflint.com; donna.cole@genesys.org; gambrose@cityofflint.com; jhenry@gchd.us; jlorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; ksmith@flint.org; larry.koehler@mcc.edu; mglasgow@cityofflint.com; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; jwgreen@lan-inc.com; mike49@sargentstitle.com
Subject: Re: Water Quality Update

Hello Howard,

Would you share with us whether the Granulated Activated Carbon system will remain in affect with the new water supply from Port Huron for the city of Flint (and possibly the county)? A patient of mine from Flushing asked and I could not answer. It would seem to be an excellent idea both from the standpoint of decreased toxic chemical/metal exposure, taste and safety of the citizens it could serve.

Thank you,

Gerald Natzke DO FAAEM
 GCMS Board Representative

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

From: Howard Croft
To: Laura Sullivan
Cc: Brent Wright ; Dayne Walling ; donna. cole ; gdn2 ; Gerald Ambrose ; Howard Croft ; James Henry ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kirk Smith ; larry.koehler ; Michael Glasgow ; Michael Wright ; Mike Lane ; Mike Prysby (DEQ) ; Natasha Henderson ; Norb Birchmeier ; Pete Levine ; Robert Bincsik ; rosejo ; Russell Hudson ; Samir Matta ; Warren Green ; Michael Sargent
Sent: Fri, Jun 26, 2015 3:41 pm
Subject: Re: Water Quality Update

As a follow up to this afternoon's email, I am answering several questions that have subsequently been asked.

The vendor is "Calgon Carbon" with headquarters in Pennsylvania. They are both the supplier of the material and the installer as well. After initial designs were approved by the DEQ, various water samples from the Flint River were drawn and sent to Calgon for two weeks of testing under various conditions to try and gauge the effectiveness of the specific carbon filters chosen. Flow rate and temperature tests were performed by our engineering firm LAN at the water plant prior to the design being developed and forwarded to the DEQ. The filter media is Granulated Activated Carbon and the first filters are scheduled for installation to begin following the 4th of July weekend.

Please forward me any additional questions that may arise.

Thank you,

On Fri, Jun 26, 2015 at 3:25 PM, Laura Sullivan <dr.laura2@gmail.com> wrote:
 Hello Howard,

Could you provide the following information to the team?

You refer to a vendor - is this the supplier of the new filter media? Testing the efficacy of the media should not be conducted by the vendor.

What tests have been conducted and under what circumstances (flow rate, temperature)? From what location was the water used in these tests collected?

What is the identity of the filter media? Is it GAC?

Yours truly,
L Sullivan

On Friday, June 26, 2015, Howard Croft <hcroft@cityofflint.com> wrote:

Technical Team,

I am writing to provide you an update on the City's ongoing plan to improve the water quality in the City of Flint.

This morning, the U of M Flint announced that recent testing showed TTHM levels slightly above the MCL in two of its buildings. The City responded to this recent information of concern with increased flushing in the area where subsequent internal tests have shown the levels to have subsided to under than 80 ppb.

The TTHM level leaving the water plant is currently in the 45 -55 ppb range and in areas with minimal circulation the level can rise by the time it reaches a tap.

The installation of new filter media at the water plant which is designed to greatly reduce the TTHM level in the plant is ahead of schedule and is expected to be installed by mid-July. The DEQ has approved the design and actual testing by the vendor over the past two weeks has verified that the selected media should work. **This is expected to have an immediate impact on TTHM levels.**

In addition to the filter installation, we have engaged in increased valve exercising over the last two months and have checked over half of the 7,000 valves in the system. The valve turning has a tendency to result in temporary water discoloration but increases the overall water circulation and identifies areas where valves are inoperable.

Our annual Consumer Confidence Report will be distributed in early July and will contain significant information about the water system. We will also include the notice of our recent quarterly testing in which all eight sites were verified to be under the MCL but the running average at one site required a notice to be sent.

I will email everyone when we schedule the next TAC team meeting which we have currently targeted for mid-August.

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

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

Human(kind). Be both.

--
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: Benzie, Richard (DEQ)
Sent: Wednesday, July 15, 2015 1:25 PM
To: Rosenthal, Adam (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: TTHMs in Flint

Just had a call from a resident of Flint whose neighbor was told yesterday by the city to not drink the water because the TTHM level at her home was 95 ppb. The caller wanted to know if animals should be consuming the water. I told her she would have to consult with a toxicologist or someone familiar with veterinary medicine. I told her animals are less susceptible to some contaminants but more so to others, but as engineers and analysts, we were not the ones that would make that decision – we just pass it on if we find out.

She asked about other TTHM sampling locations and where they were in the city. I told her to contact one of you, starting with Adam.

Rennaker, Joanne (DEQ)

From: Crooks, Jennifer <crooks.jennifer@epa.gov>
Sent: Wednesday, July 15, 2015 1:18 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Subject: RE: Flint lead sampling results?

Thank you, Steve!
 Jennifer

From: Busch, Stephen (DEQ) [mailto:BUSCHS@michigan.gov]
Sent: Wednesday, July 15, 2015 8:39 AM
To: Crooks, Jennifer; Prysby, Mike (DEQ); Cook, Pat (DEQ)
Subject: RE: Flint lead sampling results?

Jennifer,

We will provide the 90th percentile when available, but at this point we do not anticipate any violations of the Lead and Copper Rule.

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

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

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

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

Jennifer

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Wednesday, July 15, 2015 9:39 AM
To: Crooks, Jennifer; Prysby, Mike (DEQ); Cook, Pat (DEQ)
Subject: RE: Flint lead sampling results?

Jennifer,

We will provide the 90th percentile when available, but at this point we do not anticipate any violations of the Lead and Copper Rule.

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

From: Crooks, Jennifer [mailto:crooks.jennifer@epa.gov]
Sent: Tuesday, July 14, 2015 3:34 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Bair, Rita
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Jennifer

Rennaker, Joanne (DEQ)

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

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

Jennifer

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Tuesday, July 14, 2015 8:25 AM
To: Prysby, Mike (DEQ)
Cc: 'bwright@cityofflint.com'; Michael Glasgow; Busch, Stephen (DEQ); Hansen, Jeff; Howard Croft
Subject: RE: Flint WTP GAC Permit Application
Attachments: image001.gif

Mike & Steve,

Thank you both for your efforts and quick response.

We appreciate it.

Take Care.

Samir Matta, PE
 Lockwood, Andrews & Newnam, Inc.
 (517)819-2367

----- Original message -----

From: "Prysby, Mike (DEQ)"
Date: 07/14/2015 7:54 AM (GMT-05:00)
To: "Matta, Samir"
Cc: "'bwright@cityofflint.com'", Michael Glasgow , "Busch, Stephen (DEQ)"
Subject: RE: Flint WTP GAC Permit Application

Samir,

The GAC addition and sand filter media replacement for the filters at the Flint WTP is approved. Construction Permit # W 151055 issued on July 14, 2015 validates the approval. A hard copy of the permit along with a set of approved plans and specifications will be mailed out today and you should receive the set within the next few days. This e-mail; however, acknowledges issuance of the DEQ construction permit; thus construction work pertaining to this project may proceed. If you have any further questions, please don't hesitate to contact me.

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, July 13, 2015 2:29 PM
To: Prysby, Mike (DEQ)
Cc: Hansen, Jeff; Busch, Stephen (DEQ)
Subject: RE: Flint WTP GAC Permit Application

Hi Mike,

As per our phone conversation, Calgon is pumping the wet sand into a truck with screened valves in the back that allows the water to drain out while keeping the sand in the truck. The removed materials is trucked to a landfill for disposal. The new sand comes in large bags that is dumped into a hopper and pumped back into the filter after water is added to the system.

I have included photos of the sand being pumped out into the truck for your review.

We also like to have the plant facility remain at 36 MGD and not change to 30 MGD even though we do not expect the City demands to get that high.

Let me know if you need anything else.

Samir F. Matta, PE

Senior Project Manager



2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901

T 517.203.5437 **D** 517.203.5437

www.lan-inc.com • SFMatta@lan-inc.com

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Monday, July 13, 2015 11:55 AM
To: Matta, Samir
Cc: Hansen, Jeff; Busch, Stephen (DEQ)
Subject: RE: Flint WTP GAC Permit Application

Samir,

The revised plans received from you this morning along with the response and attachments from Jeff Hansen on July 8, 2015 address the majority of our comments sent on July 6, 2015. The removal and re-installation of the sand media; however, is not described. Please provide a description of the procedure to remove and re-install the sand filter media. An electronic response will be adequate.

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, July 10, 2015 11:58 AM

To: Busch, Stephen (DEQ); Hansen, Jeff

Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Green, Warren

Subject: RE: Flint WTP GAC Permit Application

Thanks Steve.

I am out of town today. I will drop the plans on Monday.

Enjoy your Weekend.

Samir Matta, PE

Lockwood, Andrews & Newnam, Inc.

(517)819-2367

----- Original message -----

From: "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>

Date: 07/10/2015 11:11 AM (GMT-05:00)

To: "Hansen, Jeff" <jrhansen@lan-inc.com>, "Matta, Samir" <SFMatta@lan-inc.com>

Cc: "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>, "Brent Wright (bwright@cityofflint.com)" <bwright@cityofflint.com>, mglasgow@cityofflint.com, "Green, Warren" <jwgreen@lan-inc.com>

Subject: RE: Flint WTP GAC Permit Application

Samir,

You may drop off revised plans today Friday or Monday. The other documents we can print.

If you come today give me a call at the number below. I will be in meetings from 12:00 – 2:00

If you come on Monday give call Mike, as he is scheduled to be back.

Thanks.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

From: Hansen, Jeff [<mailto:jrhansen@lan-inc.com>]**Sent:** Wednesday, July 08, 2015 8:52 AM**To:** Busch, Stephen (DEQ)**Cc:** Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Matta, Samir; Green, Warren**Subject:** RE: Flint WTP GAC Permit Application

Steve,

In general response to your comments, our agreement with Flint is a design/build type so on the plans we have called out specific make/models to match what Flint currently uses for a number of items on your list rather than developing entire spec sections.

Specific responses to your comments are shown below in red. Revised plans and specs are attached and we will send hard copies by mail. Attachments are as follows:

1. Calgon Filtrasorb 400 GAC media data sheet
2. Calgon media change out procedures
3. Calgon disinfection procedures
4. Revised plans – there is only 1 change to a single note on sheet 6 as described below
5. Revised specs – added sections for piping, valves and pipe testing

Thanks,

Jeffrey R. Hansen

Senior Project Manager



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

T 810.820.2682 C 810.333.3201

www.lan-inc.com • JRHansen@lan-inc.com

From: Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]**Sent:** Monday, July 06, 2015 3:50 PM**To:** Hansen, Jeff**Cc:** Matta, Samir; Green, Warren; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Prysby, Mike (DEQ)**Subject:** Flint WTP GAC Permit Application

Our office received the permit application "Fint WTP Phase II, Segment 3 Filter Media Replacement" on June 30, 2015.

The only specifications provided with the permit application were for the following:

- 05550 Bolts, Anchor Bolts And Expansion Anchors

- 09928 Protective Coating Systems

Aside from information shown on the plan sheets and what was listed in the previously submitted basis of design document, no other specifications were provided regarding:

- GAC and Sand media, including removal, installation, ripening, and disinfection procedures

Plan sheet 5 calls out effective size, uniformity coefficient, and specific gravity for GAC and sand. Also, we have selected Calgon's product Filtrasorb 400 in our agreement. We did not want to dictate means and methods on the plans or specs. However, Calgon procedures are attached for your reference as well as their Filtrasorb 400 product sheet.

- Chlorine piping, joints, valves, installation, support, etc.

Chlorine piping and valves are to be ASahi Chem Prolok which are dual wall HDPE with butt fused joints and also the same type as the existing mid point chlorination piping. We will add a specification for this and have added some wording to the pipe call out near the center of sheet 6. Specific supports are called out on the plans and notes refer to sections 09928 for coating and 05550 for anchor bolts. See Key Note #1 on sheet 6. Key note call outs are designated with a number inside a hexagon in the plan view.

- Water tight hatch to be installed

The Bilco hatch specified in Key Note #2 on sheet 6 with the options listed is water tight.

- Chlorine gas detector equipment

The specific make/model of the chlorine detection equipment is called out with Key Note #3 on sheet 6. That type was selected to match other chlorine gas detectors currently used at the plant.

Regarding the Protective Coating Systems specs and their related appendix, these are general in nature listing every part of the plant as potentially being recoated. Plan notes discuss a few items to be coated/recoated, but it is not entirely clear what the full scope of the coating work will consist of. **Coating will only be applied to those items where it is called for on the plans, which are the hangers/supports.**

We request any additional specification information regarding the above be provided for approval.

It is also noted that the basis of design is based on a flow of 30 MGD, approximately 2.5 gpm/ft² filter loading rate. The existing filters are currently rated for 36 MGD at 3 gpm/ft². This would cause the WTP capacity rating to be lowered to 30 MGD. Any future request to expand filter capacity back to 36 MGD would need to be demonstrated through filter performance testing. **We showed 30 mgd in the basis of design and on the application form only because it is unlikely Flint demands will reach 36 mgd in the next 20 years. However, we would like to maintain the 36 mgd rating – do you need the basis of design and permit application resubmitted for this?**

Stephen Busch, P.E.

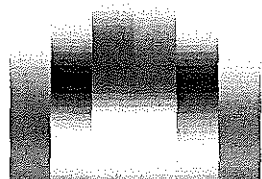
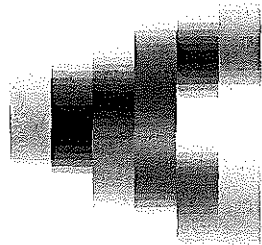
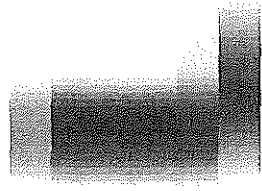
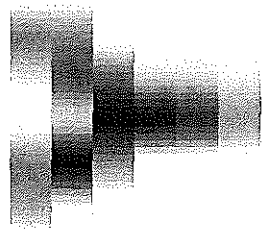
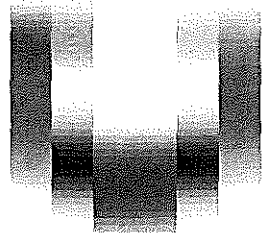
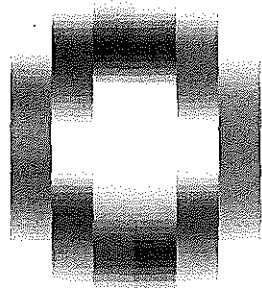
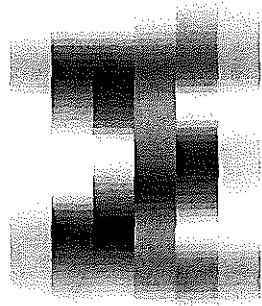
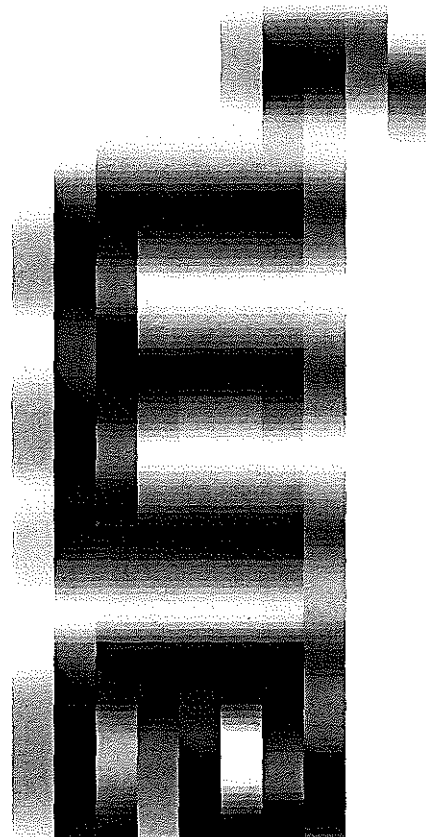
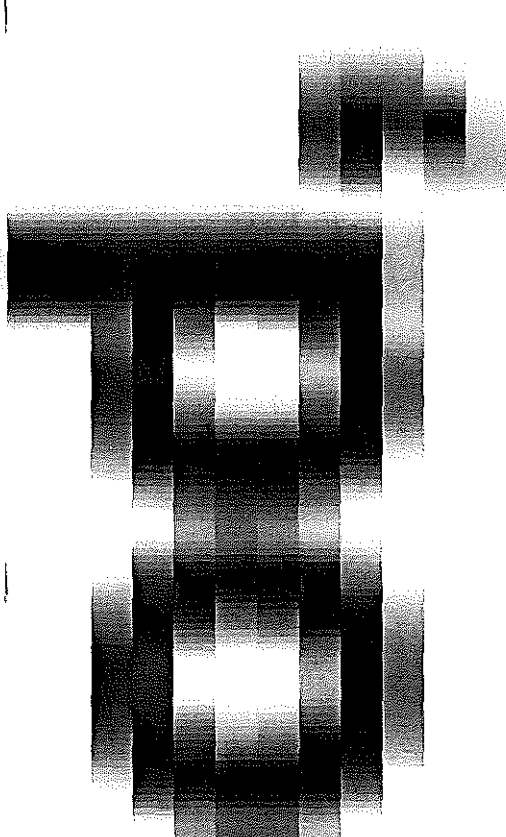
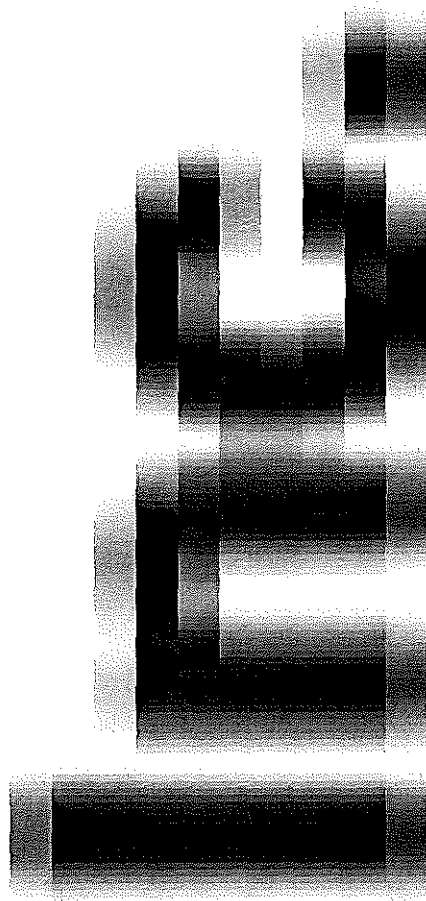
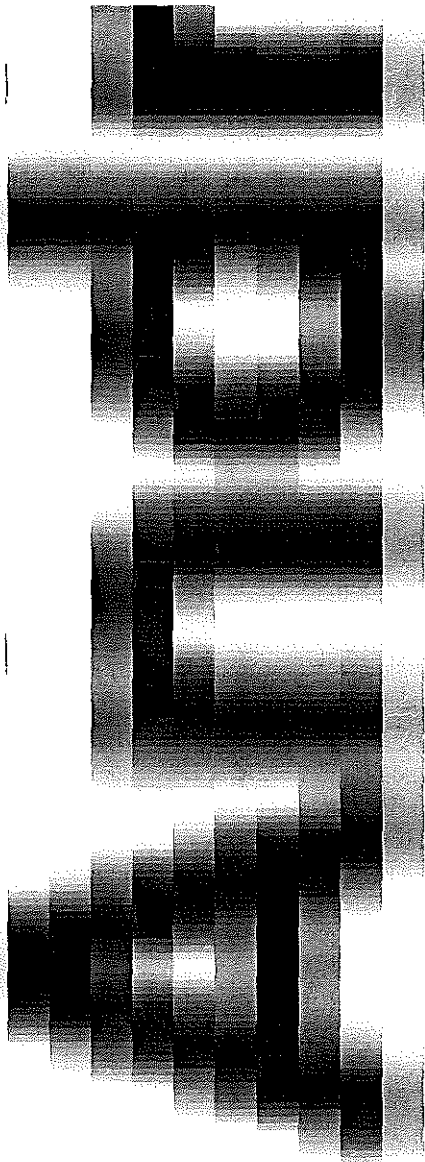
Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Tuesday, July 14, 2015 7:54 AM
To: Matta, Samir
Cc: 'bwright@cityofflint.com'; Michael Glasgow; Busch, Stephen (DEQ)
Subject: RE: Flint WTP GAC Permit Application

Samir,

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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, July 13, 2015 2:29 PM
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Cc: Hansen, Jeff; Busch, Stephen (DEQ)
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I have included photos of the sand being pumped out into the truck for your review.

We also like to have the plant facility remain at 36 MGD and not change to 30 MGD even though we do not expect the City demands to get that high.

Let me know if you need anything else.

Samir F. Matta, PE
 Senior Project Manager



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

A LEO A DALY COMPANY

2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901

T 517.203.5437 D 517.203.5437

www.lan-inc.com • SFMatta@lan-inc.com

From: Prysby, Mike (DEQ) [<mailto:PRYSBYM@michigan.gov>]

Sent: Monday, July 13, 2015 11:55 AM

To: Matta, Samir

Cc: Hansen, Jeff; Busch, Stephen (DEQ)

Subject: RE: Flint WTP GAC Permit Application

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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, July 10, 2015 11:58 AM

To: Busch, Stephen (DEQ); Hansen, Jeff

Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Green, Warren

Subject: RE: Flint WTP GAC Permit Application

Thanks Steve.

I am out of town today. I will drop the plans on Monday.

Enjoy your Weekend.

Samir Matta, PE

Lockwood, Andrews & Newnam, Inc.

(517)819-2367

----- Original message -----

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Date: 07/10/2015 11:11 AM (GMT-05:00)

To: "Hansen, Jeff" <jrhansen@lan-inc.com>, "Matta, Samir" <SFMatta@lan-inc.com>

Cc: "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>, "Brent Wright (bwright@cityofflint.com)" <bwright@cityofflint.com>, mglasgow@cityofflint.com, "Green, Warren" <jwgreen@lan-inc.com>
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Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

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Sent: Wednesday, July 08, 2015 8:52 AM

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Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Matta, Samir; Green, Warren

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Jeffrey R. Hansen

Senior Project Manager



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

T 810.820.2682 C 810.333.3201

www.lan-inc.com • JRHansen@lan-inc.com

From: Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]

Sent: Monday, July 06, 2015 3:50 PM

To: Hansen, Jeff

Cc: Matta, Samir; Green, Warren; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Prysby, Mike (DEQ)

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Stephen Busch, P.E.

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MDEQ

517-643-2314

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Monday, July 13, 2015 4:44 PM
To: Busch, Stephen (DEQ)
Subject: Flint GAC

Steve,

I am ready to issue the permit for the Flint WTP GAC project. Samir provided further details regarding the method of removing and replacing the filter sand media. I was wanting to go over the Basis of Design rating issue. I am comfortable with the 36 MGD rating as this matches the filter rated capacity. I will be in the office tomorrow for the first hour prior to the well construction meeting and can issue the permit along with electronic notification to the city and consultant.

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

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Monday, July 13, 2015 2:29 PM
To: Prysby, Mike (DEQ)
Cc: Hansen, Jeff; Busch, Stephen (DEQ)
Subject: RE: Flint WTP GAC Permit Application
Attachments: 20150707_101709.jpg; 20150707_102131.jpg; 20150707_101747.jpg; 20150707_101310.jpg; 20150707_101232.jpg

Hi Mike,

As per our phone conversation, Calgon is pumping the wet sand into a truck with screened valves in the back that allows the water to drain out while keeping the sand in the truck. The removed materials is trucked to a landfill for disposal. The new sand comes in large bags that is dumped into a hopper and pumped back into the filter after water is added to the system.

I have included photos of the sand being pumped out into the truck for your review.

We also like to have the plant facility remain at 36 MGD and not change to 30 MGD even though we do not expect the City demands to get that high.

Let me know if you need anything else.

Samir F. Matta, PE
 Senior Project Manager



2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
 T 517.203.5437 D 517.203.5437
www.lan-inc.com • SFMatta@lan-inc.com

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Monday, July 13, 2015 11:55 AM
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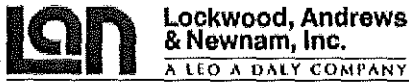
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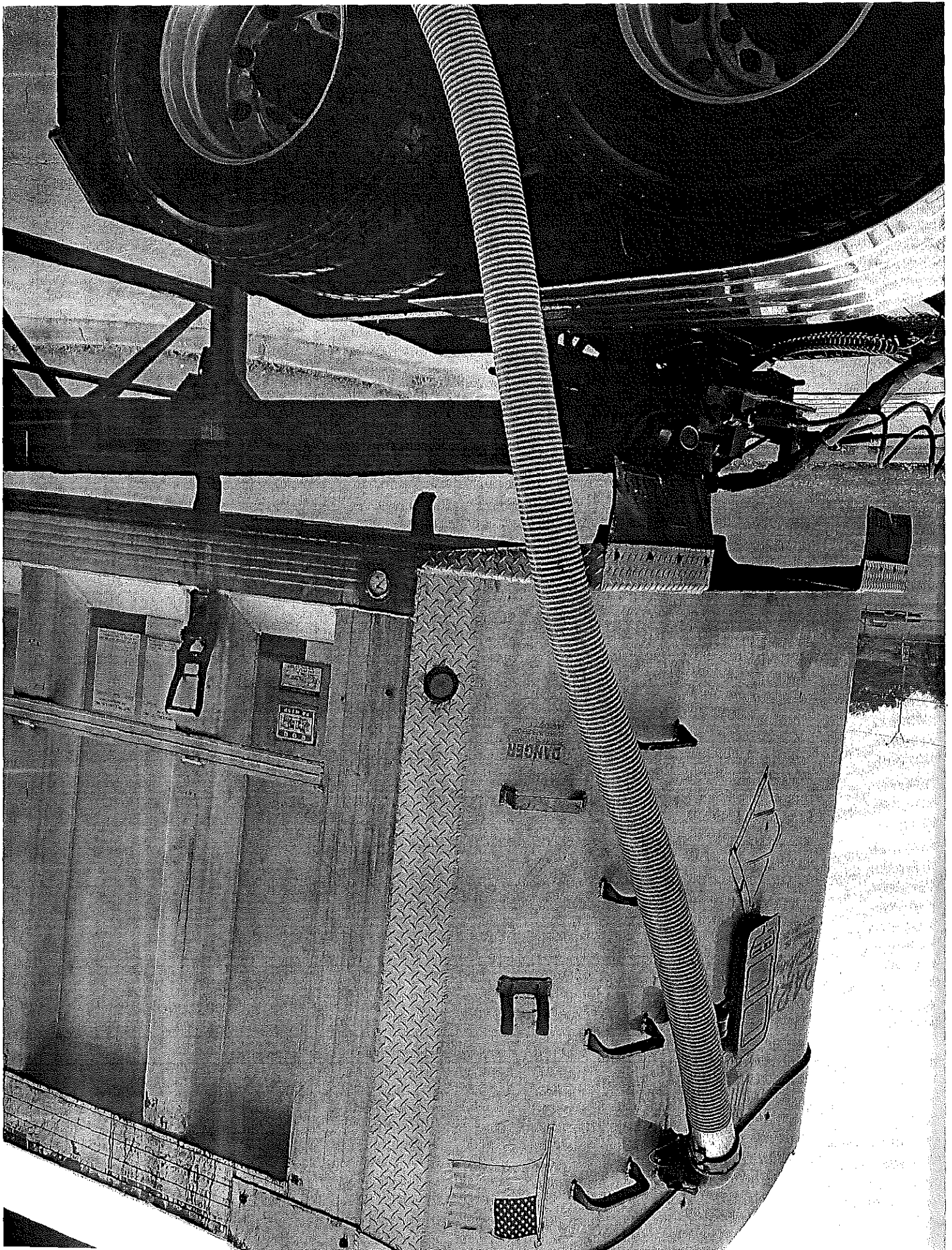
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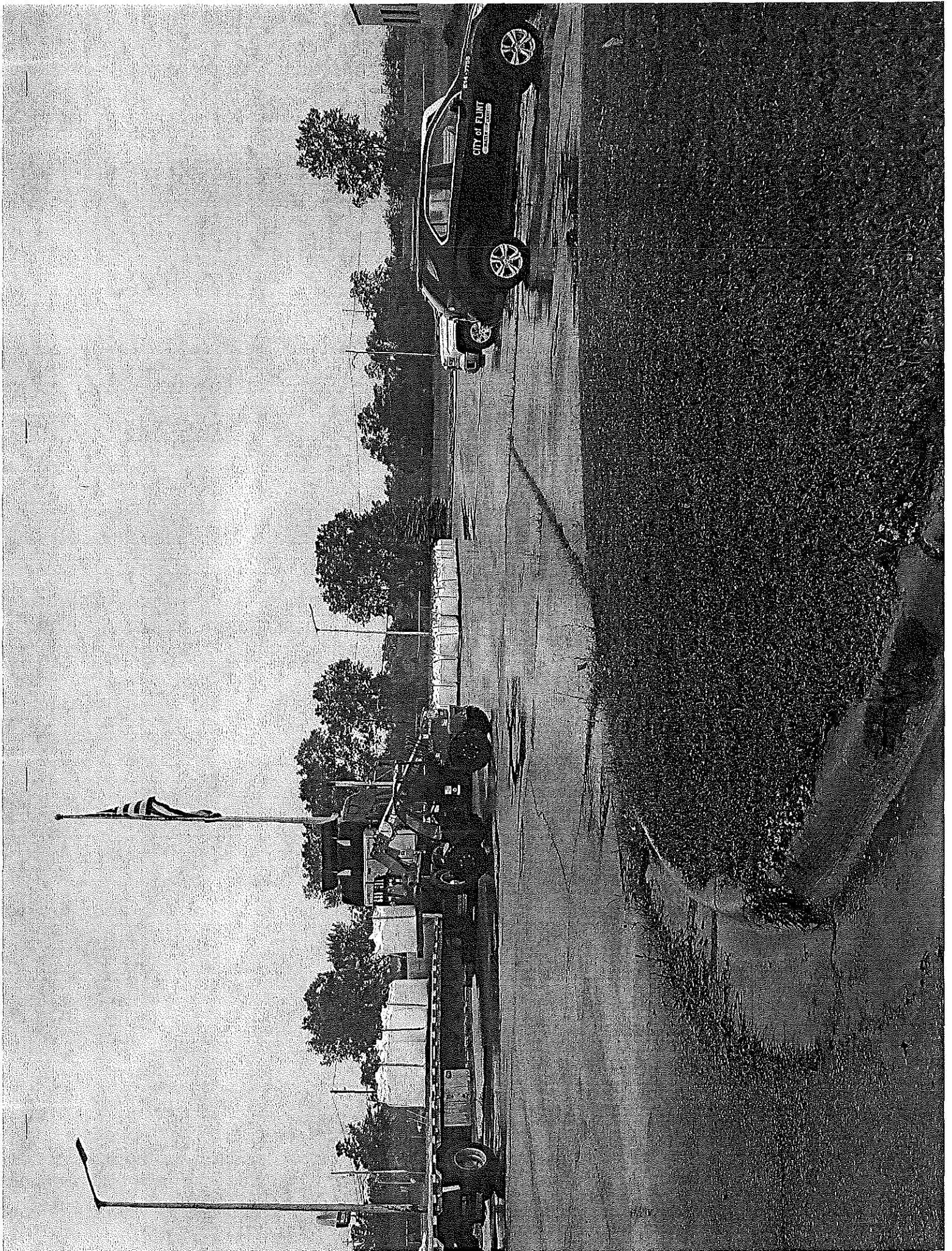
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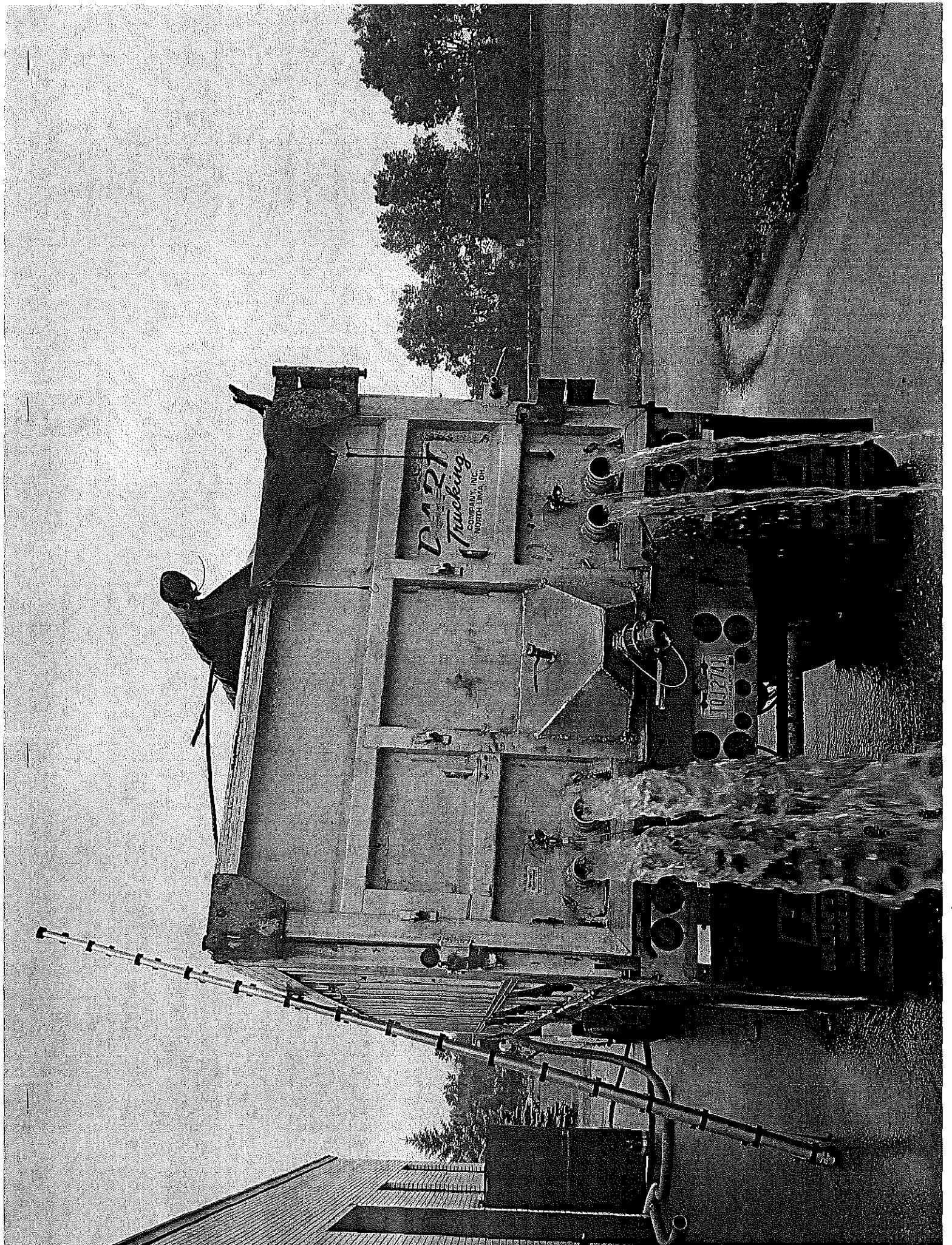
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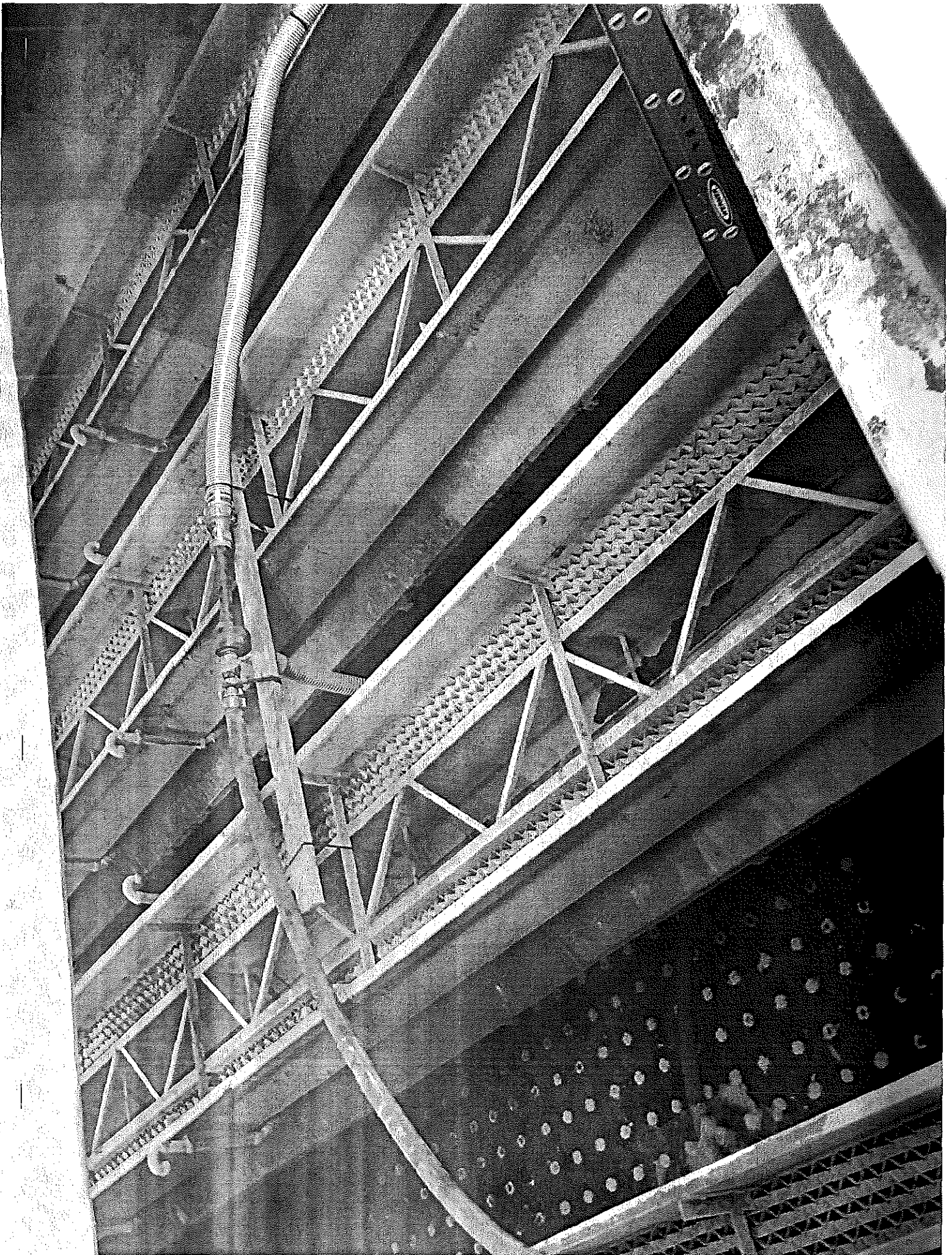
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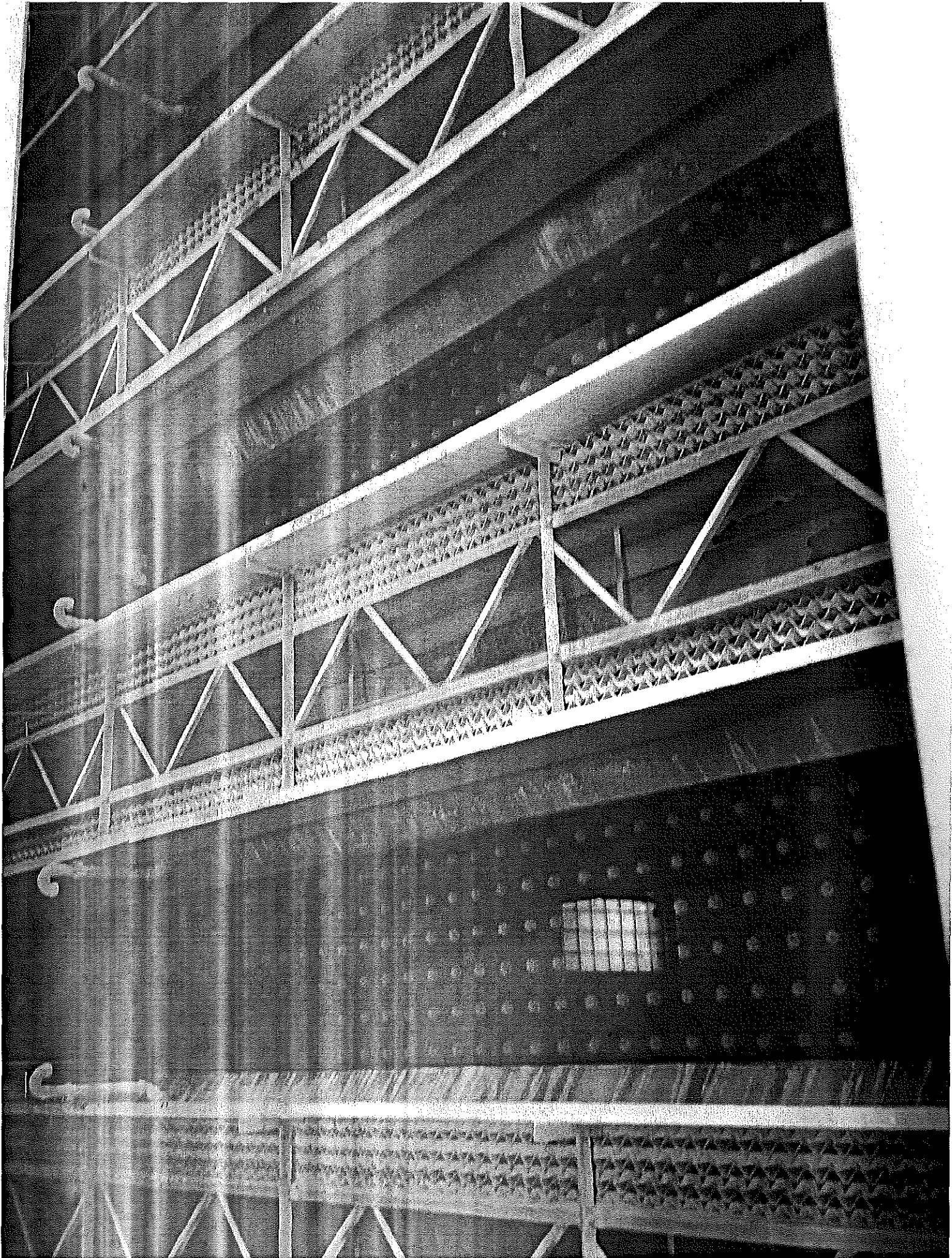
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Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Friday, July 10, 2015 4:13 PM
To: Prysby, Mike (DEQ)
Subject: City of Flint MOR - June 2015
Attachments: June 2015 MOR.pdf

Mike,

Here is a copy of the June MOR. A hard copy was mailed out earlier today.

--

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

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow

Operator-in-Charge

June 2015

Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification

Michael Glasgow

Signature of Operator-in-Charge

Genesee

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>18.5</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>90</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.3</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.3</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2.0%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>12,000</u> lb.	Est. supply:	<u>13</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>220,000</u> lb.	Est. supply:	<u>13</u> days
Lime (CaO) on hand:	<u>259</u> tons	Est. supply:	<u>32</u> days
Fluoride on Hand:	<u>18,000</u> lb.	Est. supply:	<u>45</u> days
Cost of All Chemicals per Million Gallons:	<u>n/a</u> dollars		
Total Power Cost per Million Gallons:	<u>n/a</u> dollars		

Remarks

Confluence Point # 1 (N)

Confluence Point # 2 (S)

Number of filter confluence samples > 0.3 NTU:	<u>0</u>	<u>0</u>
Number of filter confluence samples collected:	<u>211</u>	<u>211</u>
Percent of filter confluence samples > 0.3 NTU:	<u>0.0%</u>	<u>0.0%</u>
Number of filter confluence samples > 1 NTU	<u>0</u>	<u>0</u>
Did any individual filter exceed:		
1.0 NTU in two consecutive measurements taken 15 minutes apart?		<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.		
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation?		<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.		
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months?		<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.		
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months?		<u>NO</u>
If yes, attach specific filter(s) information and indicate required follow-up status.		
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month?		<u>NO</u>
If yes, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.		
Did POE disinfectant residual fall below 0.2 ppm during the month?		<u>NO</u>
If yes, indicate date(s) and duration on a separate sheet.		
Was minimum C*T credit achieved for the entire month?		<u>YES</u>
If no, indicate on a separate sheet the date(s) not achieved.		
Was continuous POE chlorine residual monitoring equipment off-line during the month?		<u>NO</u>
If yes, indicate date(s) and duration on a separate sheet.		

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

June 2015

Page 3

WSSN: 2310

Date	Turbidity, Units												Point of Entry Plant Tap NTU
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						
	Number of Samples	Avg.	Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU	No. of Samples >0.3 NTU	Number of Samples	Avg.	Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU	No. of Samples >0.3 NTU	
1	7	0.10	0.13	6	0	0	7	0.09	0.09	6	0	0	0.09
2	8	0.07	0.09	6	0	0	8	0.07	0.08	6	0	0	0.07
3	7	0.09	0.11	6	0	0	7	0.08	0.12	6	0	0	0.09
4	6	0.09	0.11	6	0	0	6	0.08	0.09	6	0	0	0.09
5	7	0.09	0.10	6	0	0	7	0.08	0.09	6	0	0	0.09
6	8	0.08	0.10	6	0	0	8	0.07	0.08	6	0	0	0.08
7	7	0.07	0.08	6	0	0	7	0.07	0.10	6	0	0	0.09
8	8	0.09	0.13	6	0	0	8	0.06	0.08	6	0	0	0.08
9	6	0.09	0.15	6	0	0	7	0.08	0.09	6	0	0	0.07
10	7	0.13	0.23	6	0	0	7	0.07	0.11	6	0	0	0.09
11	7	0.08	0.14	6	0	0	7	0.07	0.10	6	0	0	0.12
12	7	0.08	0.10	6	0	0	7	0.08	0.09	6	0	0	0.08
13	7	0.08	0.11	6	0	0	7	0.08	0.10	6	0	0	0.09
14	8	0.09	0.16	6	0	0	8	0.08	0.10	6	0	0	0.09
15	7	0.08	0.09	6	0	0	7	0.07	0.08	6	0	0	0.08
16	7	0.07	0.11	6	0	0	7	0.08	0.13	6	0	0	0.08
17	7	0.07	0.10	6	0	0	7	0.06	0.07	6	0	0	0.07
18	6	0.08	0.10	6	0	0	6	0.08	0.09	6	0	0	0.07
19	6	0.07	0.08	5	0	0	6	0.06	0.07	5	0	0	0.09
20	8	0.08	0.09	6	0	0	8	0.08	0.11	6	0	0	0.09
21	7	0.09	0.10	6	0	0	7	0.09	0.11	6	0	0	0.10
22	7	0.07	0.09	6	0	0	7	0.08	0.11	6	0	0	0.09
23	7	0.07	0.10	6	0	0	7	0.06	0.08	6	0	0	0.08
24	7	0.09	0.11	6	0	0	7	0.08	0.12	6	0	0	0.08
25	7	0.09	0.10	6	0	0	7	0.08	0.09	6	0	0	0.09
26	6	0.11	0.15	5	0	0	6	0.08	0.10	5	0	0	0.09
27	7	0.10	0.14	6	0	0	7	0.09	0.12	6	0	0	0.10
28	7	0.13	0.17	6	0	0	7	0.09	0.11	6	0	0	0.12
29	7	0.10	0.12	6	0	0	7	0.09	0.10	6	0	0	0.10
30	7	0.12	0.15	6	0	0	7	0.10	0.13	6	0	0	0.09
Avg.	7	0.09	0.12	6	0	0	7	0.08	0.10	6	0	0	
Max.	8	0.13	0.23	6	0	0	8	0.10	0.13	6	0	0	0.12
Min.	6	0.07	0.08	5	0	0	6	0.06	0.07	5	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

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Date	Fluoride Applied as F- mg/L	Fluoride Analysis (mg/L)			Chlorine Application (mg/L)			Chlorine Residual (mg/L)					
					Intermediate Chlorine	Post Chlorine	Total Chlorine	Filtered		3 MG Well		Tap	
		Raw	Tap	Dist.				Free	Total	Free	Total	Free	Total
1	0.6	0.20	0.73		2.8	2.6	5.4	0.4	0.7	1.6	1.9	1.4	1.8
2	0.6	0.19	0.81		2.7	2.3	5.0	0.5	0.8	1.7	2.0	1.7	1.9
3	0.6	0.20	0.79		2.7	2.5	5.2	0.4	0.5	1.7	2.0	1.7	2.0
4	0.6	0.20	0.82	0.76	2.8	2.1	4.9	0.5	0.7	1.8	2.0	1.7	1.9
5	0.6	0.20	0.82		2.6	2.2	4.8	0.6	0.8	1.9	2.2	1.4	1.7
6	0.6	0.20	0.74		2.5	2.2	4.7	0.4	0.6	1.9	2.2	1.8	2.1
7	0.6	0.20	0.76		2.1	2.1	4.2	0.3	0.6	1.8	2.1	1.7	1.9
8	0.6	0.19	0.78		2.2	2.3	4.5	0.4	0.6	1.9	2.1	1.8	2.1
9	0.6	0.20	0.70		2.7	2.7	5.4	0.5	0.7	1.6	1.8	1.6	1.8
10	0.6	0.20	0.74	0.70	2.6	2.6	5.2	0.4	0.5	1.9	2.1	1.5	1.8
11	0.6	0.20	0.75		2.6	2.7	5.3	0.3	0.5	1.5	1.7	1.5	1.7
12	0.6	0.20	0.72		2.6	2.6	5.2	0.5	0.8	1.7	2.1	1.6	1.9
13	0.6	0.20	0.70		2.7	2.4	5.1	0.3	0.5	1.7	2.0	1.7	2.0
14	0.6	0.19	0.69		2.8	2.7	5.5	0.3	0.4	1.7	1.9	1.7	1.9
15	0.6	0.20	0.72		2.9	2.8	5.7	0.3	0.5	1.8	2.1	1.7	1.9
16	0.6	0.20	0.80		2.5	2.2	4.7	0.3	0.5	1.8	2.0	1.8	2.0
17	0.5	0.19	0.70		2.9	2.3	5.2	0.5	0.7	1.8	2.0	1.7	2.0
18	0.5	0.20	0.70	0.72	2.8	2.8	5.6	0.4	0.5	1.9	2.3	1.9	2.3
19	0.6	0.20	0.74		2.6	2.5	5.1	0.5	0.7	1.8	2.2	0.7	0.9
20	0.5	0.19	0.71		3.0	2.6	5.6	0.3	0.5	1.7	1.9	1.7	1.9
21	0.6	0.19	0.72		3.1	2.9	6.0	0.3	0.5	1.8	2.1	1.7	2.0
22	0.6	0.19	0.70		3.4	2.6	6.0	0.4	0.7	1.9	2.2	0.7	0.9
23	0.6	0.19	0.81		3.6	2.9	6.5	0.4	0.7	1.7	1.9	1.7	1.9
24	0.6	0.20	0.82		3.4	2.6	6.0	0.5	0.7	1.7	2.0	1.5	1.8
25	0.6	0.19	0.73		3.3	2.5	5.8	0.3	0.5	1.5	1.7	0.5	0.8
26	0.6	0.19	0.72		3.2	3.5	6.7	0.6	0.8	2.5	2.8	2.0	2.2
27	0.5	0.18	0.71		3.1	3.2	6.3	0.5	0.7	2.7	3.0	0.6	0.9
28	0.5	0.18	0.65		3.2	3.6	6.8	0.3	0.5	1.8	2.1	1.7	2.0
29	0.5	0.19	0.70		3.3	3.2	6.5	0.4	0.7	2.4	2.8	2.3	2.6
30	0.5	0.19	0.71		3.2	3.5	6.7	0.3	0.6	1.8	2.1	1.8	2.1
Avg.	0.58	0.19	0.74	0.73	2.9	2.7	5.5	0.4	0.6	1.8	2.1	1.6	1.8
Max.	0.60	0.20	0.82	0.76	3.6	3.6	6.8	0.6	0.8	2.7	3.0	2.3	2.6
Min.	0.50	0.18	0.65	0.70	2.1	2.1	4.2	0.3	0.4	1.5	1.7	0.5	0.8

Chemical Analyses

City of Flint Water Treatment Plant

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Date	pH (S.U.)		Total Hardness as CaCO ₃ (mg/L)		Total Alkalinity as CaCO ₃ (mg/L)		Non-Carbonate Hardness as CaCO ₃ (mg/L)		Calcium as Ca ²⁺ (mg/L)		Magnesium as Mg ²⁺ (mg/L)		Chloride as Cl ⁻ (mg/L)	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
1	8.18	7.64	272	180	226	76	46	104	86.6	63.3	13.6	5.3	48	88
2	7.97	7.56	271	177	216	61	55	116	93.0	60.9	10.2	7.8	46	92
3	7.97	7.60	274	178	222	74	52	104	82.6	61.7	16.5	5.8	49	90
4	7.89	7.70	274	160	222	54	52	106	84.2	57.7	15.6	3.9	47	93
5	7.88	7.55	274	190	222	76	52	114	81.0	64.1	17.5	7.3	49	94
6	7.89	7.69	277	176	221	66	56	110	94.6	60.9	10.2	5.8	44	89
7	7.96	7.75	275	185	224	72	51	113	93.8	64.9	9.7	6.3	48	92
8	7.90	7.67	280	185	224	73	56	112	96.2	68.9	9.7	4.4	46	92
9	7.94	7.67	272	164	224	54	48	110	76.2	56.9	19.9	5.3	50	95
10	7.94	7.60	278	148	226	40	52	108	78.6	52.1	19.4	4.4	50	94
11	7.94	7.55	276	172	228	66	48	106	80.2	63.3	18.5	3.4	49	94
12	8.11	7.75	278	190	228	86	50	104	82.6	68.1	17.5	4.9	49	93
13	8.01	7.75	278	197	225	89	53	108	97.8	75.4	8.7	2.9	46	92
14	7.88	7.67	277	196	225	89	52	107	93.0	68.9	11.2	6.3	48	89
15	7.99	7.76	276	206	226	94	50	112	94.6	74.5	9.7	4.9	48	95
16	8.02	7.65	272	194	224	76	48	118	92.2	68.1	12.6	5.3	46	100
17	7.95	7.72	264	202	224	90	40	112	91.4	77.0	8.7	2.4	48	93
18	7.90	7.58	270	174	222	62	48	112	80.2	59.3	17.9	6.3	49	96
19	7.92	7.49	276	182	226	72	50	110	80.2	67.3	18.5	3.4	48	97
20	7.95	7.71	279	193	229	101	50	92	94.6	71.3	11.7	2.9	46	82
21	7.92	7.51	280	173	228	75	52	98	92.2	67.3	12.6	2.9	47	84
22	8.03	7.57	274	176	236	74	38	102	94.6	64.9	9.2	3.4	45	86
23	7.98	7.40	274	210	236	112	38	98	89.0	82.6	12.6	0.9	48	93
24	7.98	7.43	278	214	236	128	42	86	81.8	72.1	17.9	8.3	50	97
25	7.97	7.48	274	194	226	94	48	100	83.4	74.5	15.4	1.9	48	91
26	7.90	7.55	278	200	228	100	50	100	79.4	75.4	21.9	2.9	48	93
27	7.96	7.56	282	186	238	78	44	108	92.2	76.2	12.6	2.9	46	89
28	7.97	7.56	276	164	230	62	46	102	85.0	56.9	15.6	5.3	46	89
29	7.97	7.70	276	167	228	59	48	108	86.6	57.7	14.6	7.3	45	89
30	8.32	7.56	258	160	212	60	46	100	83.4	44.9	12.2	11.7	47	86
Avg.	7.97	7.61	275	183	226	77	49	106	87.4	65.9	14.1	4.9	47	92
Max.	8.32	7.76	282	214	238	128	56	118	97.8	82.6	21.9	11.7	50	100
Min.	7.88	7.40	258	148	212	40	38	86	76.2	44.9	8.7	0.9	44	82

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
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June 2015

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Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conductivity (mS)	Temp. C	Color		Odor	
	Raw (Colilert MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap	Tap	Raw	Raw	Tap	Raw	Tap
1	1	2098	12	0	1	0	970	< 2	0.50	18.8				
2	1	295	12	0	1	0	280	< 2	0.50	18.5				
3	1	171	12	0	1	0	230	< 2	0.50	18.8				
4	1	262	12	0	1	0	230	< 2	0.47	18.8				
5	1	768	12	0	1	0	450	< 2	0.51	19.1				
6	1	262	12	0	1	0	300	< 2	0.48	18.7				
7	1	134	12	0	1	0	480	< 2	0.50	18.7				
8	1	98	12	0	1	0	350	< 2	0.50	19.4				
9	1	1733	12	0	1	0	623	< 2	0.47	19.5				
10	1	195	12	0	1	0	280	< 2	0.45	19.9				
11	1	175	12	0	1	0	230	< 2	0.49	20.0				
12	1	546	12	0	1	0	770	< 2	0.52	21.5				
13	1	426	12	0	1	0	260	< 2	0.54	20.5				
14	1	5172	12	0	1	0	800	2	0.52	20.3				
15	1	733	12	0	1	0	260	< 2	0.54	20.5				
16	1	512	12	0	1	0	260	< 2	0.52	21.0				
17	1	404	12	0	1	0	300	< 2	0.54	22.2				
18	1	228	12	0	1	0	1120	< 2	0.50	20.5				
19	1	2247	10	0	1	0	4400	< 2	0.52	21.2				
20	1	326	12	0	1	0	> 738	< 2	0.51	20.9				
21	1	265	12	0	1	0	2160	< 2	0.50	20.6				
22	1	683	12	0	1	0	1770	< 2	0.50	20.9				
23	1	2098	12	0	1	0	1660	< 2	0.56	20.9				
24	1	960	12	0	1	0	1120	< 2	0.60	20.8				
25	1	455	12	0	1	0	1120	< 2	0.54	21.1				
26	1	1246	10	0	1	0	3550	< 2	0.53	20.9				
27	1	395	12	0	1	0	450	< 2	0.49	20.3				
28	1	495	12	0	1	0	450	< 2	0.47	20.5				
29	1	428	12	0	1	0	450	< 2	0.46	20.8				
30	1	4884	12	0	1	0	2760	< 2	0.48	21.9				

Avg.									0.51	20.3				
Max.		5172					4400	< 2	0.60	22.2				
Min.									0.45	18.5				

Distribution System
MonitoringCity of Flint Water Treatment Plant
WSSN: 2310

June 2015

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Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WS	
1											0
2											0
3	0.1	1.0	1.2	0.7	0.3	0.2	0.5	1.0	1.0	1.0	10
4	0.7	0.7	1.0	0.1	0.3	0.4	0.5	1.1	0.1	1.2	10
5											0
6											0
7											0
8											0
9	0.7	0.5	1.0	0.7	0.3	0.3	0.6	1.1	0.2	1.1	10
10	0.1	1.0	1.0	0.7	0.2	0.2	0.4	1.0	0.1	0.8	10
11	0.2	0.7	0.7	0.5	0.2	0.1	0.4	0.9	0.8	0.1	10
12											0
13											0
14											0
15											0
16											0
17	0.1	0.7	1.1	0.8	0.3	0.1	0.2	1.1	0.5	1.2	10
18	0.6	0.9	1.1	0.7	0.2	0.2	0.3	1.0	1.0	1.2	10
19											0
20											0
21											0
22											0
23	0.4	0.7	0.7	0.4	0.3				0.1	0.5	7
24	0.5	0.8	0.8	0.4	0.2	0.2	0.3	0.9	0.1	1.3	10
25						0.3	0.5	0.9	0.5		4
26											0
27											0
28											0
29											0
30	0.7	0.8	1.0	0.5	0.3	0.3	0.7	1.3	0.5	0.9	10

Distribution Sample Summary

Total # of routine distribution samples analyzed	101
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	1
Percent of routine distribution samples positive	1%

See page 9 for positive sample information.

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	0.60

WSSN: 2310

Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1											0
2											0
3	0.3	1.2	1.5	1.0	0.5	0.4	0.8	1.2	1.2	1.2	10
4	1.0	1.0	1.3	0.2	0.5	0.5	0.8	1.3	0.2	1.5	10
5											0
6											0
7											0
8											0
9	1.0	0.8	1.3	1.0	0.4	0.5	0.9	1.3	0.3	1.4	10
10	0.1	1.3	1.3	1.0	0.5	0.4	0.6	1.2	0.2	1.0	10
11	0.3	1.0	1.0	0.8	0.4	0.2	0.7	1.1	1.0	0.2	10
12											0
13											0
14											0
15											0
16											0
17	0.2	1.1	1.3	1.1	0.6	0.4	0.5	1.5	0.8	1.5	10
18	0.9	1.2	1.3	1.0	0.5	0.5	0.5	1.4	1.2	1.5	10
19											0
20											0
21											0
22											0
23	0.6	1.0	1.0	0.7	0.5				0.1	0.8	7
24	0.7	1.1	1.1	0.6	0.4	0.4	0.5	1.2	0.2	1.5	10
25						0.4	0.7	1.2	0.7		4
26											0
27											0
28											0
29											0
30	1.0	1.2	1.3	0.7	0.5	0.5	1.0	1.6	0.8	1.1	10

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	0.8

Positive Distribution Samples

[illegible]

Rennaker, Joanne (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Friday, July 10, 2015 11:58 AM
To: Busch, Stephen (DEQ); Hansen, Jeff
Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Green, Warren
Subject: RE: Flint WTP GAC Permit Application

| Thanks Steve.

I am out of town today. I will drop the plans on Monday.

Enjoy your Weekend.

Samir Matta, PE
 Lockwood, Andrews & Newnam, Inc.
 (517)819-2367

----- Original message -----

| From: "Busch, Stephen (DEQ)" <BUSCHS@michigan.gov>
 | Date: 07/10/2015 11:11 AM (GMT-05:00)
 | To: "Hansen, Jeff" <jrhansen@lan-inc.com>, "Matta, Samir" <SFMatta@lan-inc.com>
 | Cc: "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>, "Brent Wright (bwright@cityofflint.com)"
 | <bwright@cityofflint.com>, mglasgow@cityofflint.com, "Green, Warren" <jwgreen@lan-inc.com>
 | Subject: RE: Flint WTP GAC Permit Application

Samir,

You may drop off revised plans today Friday or Monday. The other documents we can print.

| If you come today give me a call at the number below. I will be in meetings from 12:00 – 2:00

| If you come on Monday give call Mike, as he is scheduled to be back.

Thanks.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

From: Hansen, Jeff [mailto:jrhansen@lan-inc.com]

Sent: Wednesday, July 08, 2015 8:52 AM

To: Busch, Stephen (DEQ)

Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Matta, Samir; Green, Warren

Subject: RE: Flint WTP GAC Permit Application

Steve,

In general response to your comments, our agreement with Flint is a design/build type so on the plans we have called out specific make/models to match what Flint currently uses for a number of items on your list rather than developing entire spec sections.

Specific responses to your comments are shown below in red. Revised plans and specs are attached and we will send hard copies by mail. Attachments are as follows:

1. Calgon Filtrasorb 400 GAC media data sheet
2. Calgon media change out procedures
3. Calgon disinfection procedures
4. Revised plans - there is only 1 change to a single note on sheet 6 as described below
5. Revised specs - added sections for piping, valves and pipe testing

Thanks,

Jeffrey R. Hansen

Senior Project Manager



**Lockwood, Andrews
& Newnam, Inc.**
A LUNDA COMPANY

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

T 810.820.2682 C 810.333.3201

www.lan-inc.com • JRHansen@lan-inc.com

From: Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]
Sent: Monday, July 06, 2015 3:50 PM**To:** Hansen, Jeff**Cc:** Matta, Samir; Green, Warren; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Prysby, Mike (DEQ)**Subject:** Flint WTP GAC Permit Application

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The only specifications provided with the permit application were for the following:

- 05550 Bolts, Anchor Bolts And Expansion Anchors
- 09928 Protective Coating Systems

Aside from information shown on the plan sheets and what was listed in the previously submitted basis of design document, no other specifications were provided regarding:

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Plan sheet 5 calls out effective size, uniformity coefficient, and specific gravity for GAC and sand. Also, we have selected Calgon's product Filtrasorb 400 in our agreement. We did not want to dictate means and methods on the plans or specs. However, Calgon procedures are attached for your reference as well as their Filtrasorb 400 product sheet.

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Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

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Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Friday, July 10, 2015 11:11 AM
To: Hansen, Jeff; Matta, Samir
Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Green, Warren
Subject: RE: Flint WTP GAC Permit Application

Samir,

You may drop off revised plans today Friday or Monday. The other documents we can print.

If you come today give me a call at the number below. I will be in meetings from 12:00 – 2:00

If you come on Monday give call Mike, as he is scheduled to be back.

Thanks,

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

From: Hansen, Jeff [mailto:jrhansen@lan-inc.com]
Sent: Wednesday, July 08, 2015 8:52 AM
To: Busch, Stephen (DEQ)
Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Matta, Samir; Green, Warren
Subject: RE: Flint WTP GAC Permit Application

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2. Calgon media change out procedures
3. Calgon disinfection procedures
4. Revised plans – there is only 1 change to a single note on sheet 6 as described below
5. Revised specs – added sections for piping, valves and pipe testing

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Jeffrey R. Hansen
 Senior Project Manager



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From: Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]

Sent: Monday, July 06, 2015 3:50 PM

To: Hansen, Jeff

Cc: Matta, Samir; Green, Warren; mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Prysby, Mike (DEQ)

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Plan sheet 5 calls out effective size, uniformity coefficient, and specific gravity for GAC and sand. Also, we have selected Calgon's product Filtrasorb 400 in our agreement. We did not want to dictate means and methods on the plans or specs. However, Calgon procedures are attached for your reference as well as their Filtrasorb 400 product sheet.
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- Chlorine gas detector equipment
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Regarding the Protective Coating Systems specs and their related appendix, these are general in nature listing every part of the plant as potentially being recoated. Plan notes discuss a few items to be coated/recoated, but it is not entirely clear what the full scope of the coating work will consist of. Coating will only be applied to those items where it is called for on the plans, which are the hangers/supports.

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Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Thursday, July 09, 2015 2:22 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: FW: lead/copper
Attachments: June 2015 Bromate Results.pdf

fyi

From: Michael Glasgow [<mailto:mglasgow@cityofflint.com>]
Sent: Thursday, July 09, 2015 2:19 PM
To: Rosenthal, Adam (DEQ)
Cc: Brent Wright
Subject: Re: lead/copper

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

Also, I have attached a copy of our June bromate test results.

On Thu, Jul 9, 2015 at 9:55 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike, do you have a count on how many lead/copper samples were turned in? I know they all haven't been run at the lab yet, but if I can verify how many there will be, that would be good. So far I have 70 results and the City is below the AL for lead – current 90th = 13 ppb. All the copper results are below.

thanks,

Adam Rosenthal, EQA

MDEQ – Office of Drinking Water and Municipal Assistance

Lansing District – Constitution Hall 1SW

PO Box 30242

Lansing, MI 48909

517-284-6644

fax: 517-241-3571

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

--

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

**NSF International**

789 N. Dixboro Rd. Ann Arbor, MI 48105, USA
 1-800.NSF.MARK | +1-734.769.8010 | www.nsf.org

TEST REPORT**Send To: C0211289**

Mr. Michael Glasgow
 City of Flint, Municipality
 1101 South Saginaw Street
 Flint, MI 48502

Facility: C0211290

City of Flint Water Plant
 4500 North Dort Highway
 Flint MI 48505
 United States

Result	COMPLETE	Report Date	26-JUN-2015
Customer Name	City of Flint, Municipality		
Tested To	USFDA CFR Title 21 Part 165.110		
Description	Municipal Water		
Test Type	Test Only		
Job Number	J-00173940		
Project Number	10005233 (CL06)		
Project Manager	Anna Ciechanowski		

Thank you for having your product tested by NSF International.

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

Report Authorization Kerri L. Levanseler
 Kerri Levanseler - Director, Chemistry Laboratory

Date 26-JUN-2015

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 06/22/2015 08:45 EDT
Product Description: Municipal Water
Test Description: Bromate - June 2015

Sample Id: **S-0001167921**
Description: Municipal Water - 06/22/2015 08:45 EDT
Sampled Date: 06/22/2015
Received Date: 06/23/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	5	ND	10	ug/L	Pass



<<Additional Information>>

Sample Id: S-0001167921

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Disinfection Residuals/Disinfection By-Products			
Bromate (Ref: EPA 300.1)	25-JUN-2015		

**Testing Laboratories:**

	Flag	Id	Address
All work performed at: (Unless otherwise specified)	→	NSF_AA	NSF International 789 N. Dixboro Road Ann Arbor MI 48105

References to Testing Procedures:

NSF Reference	Parameter / Test Description
C3015	Bromate (Ref: EPA 300.1)

Certifications:

Arizona (# AZ0655)	California (# 03214 CA)	Connecticut (# PH-0625)
Florida (# E-87752 FL)	Hawaii	Indiana
Maryland (# 201)	Michigan (# 0048)	North Carolina (# 26701)
New Jersey (# MI770)	Nevada (# MI000302010A)	New York (# 11206)
Pennsylvania (# 68-00312)	South Carolina (# 81005)	Virginia (# 00045)
Vermont (# VT 11206)		

Test descriptions preceded by an asterisk "*" indicate that testing has been performed per NSF International requirements but is not within its scope of accreditation.

The reported result for Odor, Phenolics, Potassium, Specific Conductance and Total Residual Chlorine cannot be used for compliance purposes within the State of Arizona.

Notes:

- 1) Bottled water sold in the United States shall not contain Fluoride in excess of the levels published by the USFDA in 21 CFR Part 165.110. These levels are based on the annual average of maximum daily air temperatures at the location where the bottled water is sold at retail. Please refer to the most current edition of the regulation to determine the Fluoride maximum level that pertains to your product.
- 2) A blank on the FDA SOQ column indicates that no maximum level has been established by the FDA for that contaminant.
- 3) An ND result means that the contaminant was not detected at or above the reporting limit.

For a list of NSF International Method Detection Limits refer to
http://www.nsf.org/media/enews/documents/minimum_detection_level_spreadsheet.pdf.

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Cc: Prysby, Mike (DEQ); Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com; Matta, Samir; Green, Warren
Subject: RE: Flint WTP GAC Permit Application
Attachments: CarbonExchangeGravityFilters_carbontransferprocedure.pdf; FS.SOP.4.8 - Filter Disinfection Using Sodium Hypochlorite.pdf; Calgon_F400.pdf; Flint WTP Ph-II Seg-3 GAC_07-07-15-to-MDEQ.pdf; Flint-GACandCL2-specs-toMDEQ_07-07-15.pdf

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500 Calgon Carbon Drive
Pittsburgh, PA 15205

**CARBON EXCHANGE PROCEDURES
FOR POTABLE WATER GRAVITY FILTERS**

A carbon exchange consists of the removal of spent carbon from a filter and the installation of fresh carbon into the filter. The following procedures can also be used for initial carbon fills.

All spent carbon removals are completed hydraulically using the eduction method from the filter into an open dump truck.

The carbon installation can be completed from bulk truck deliveries or from 1,000-pound super sack deliveries. The eduction method can be used for installation from bulk trucks and from super sacks. A crane can be used to dump the carbon from the super sacks directly into the filter, allowing the filter to be filled when high-pressure water is not available.

The following section lists requirements for accomplishing a carbon exchange. The responsible party is noted after each item, either "customer" or Calgon Carbon "CCC". The designation of responsibility is for a typical project but can vary based on the specifications of the project.

1. **PROJECT REQUIREMENTS**

For removal of spent carbon or installation of fresh carbon using the eduction method the following is required:

1. Utilities

1. A water source of at least 90 to 100 psi at 200 gpm. The supplied water source comes from the closest fire hydrant or a line, which is near a pump (i.e., a surface sweep pump). (Customer)
2. A 2-1/2" fire hose reduced to 2" FNPT to connect to the eductor supplied by Calgon Carbon. The connection at the eductor is carbon removal and at the trailer for carbon installation. (Customer)
3. A 3/4" garden hose at the filter for rinsing off the waders used by the labor force for carbon removal and at the trailer to insert in the hopper during carbon installation. (Customer)
4. A drain to handle the disposal of water used in removing the spent carbon. The drain capacity should be equal to or greater than the water supplied for the carbon removal. (Customer)

2. Manpower

1. A plant operator to open or close plant water valves. (Customer)
2. Two (2) or three (3) laborers depending on the extent of work required. (Customer or CCC)
3. Supervision of installation. (CCC)

3. Miscellaneous

1. For installation or removal using a bulk trailer, an area large enough to stage one (1) or two (2) trailers is required. The approximate dimensions of a trailer are 51' long x 8'5" wide x 11'6" high. (Customer)
2. Sufficient storage for the super sacks upon arrival. The recommended storage area is an enclosed building. If this is not available and the carbon is stored outside for an extended period of time, the super sacks should be covered with tarpaulins or plastic and kept away from areas which have inadequate drainage to prevent submersion of any carbon in free-standing water. (Customer)
3. The necessary equipment (crane and/or forklift) and manpower to receive and stage the carbon in super sacks prior to loading the filters. The carbon can be hydraulically or dry installed. The super sacks weigh 1,000 pounds each, have an 18" discharge chute, and are stacked two (2) high with a pallet under the bottom super sack. (Customer)
4. The disposal of all super sacks and pallets. (Customer)
5. All transfer equipment, which includes a hopper, and eductor, a suction hose with wand, a F/F coupler, carbon slurry hoses, and a trough. (CCC)
6. Transportation for spent carbon return and virgin carbon delivery. (CCC)
7. Removal/installation sign-off certificates, which require a signature from the site contact and the Calgon Carbon Supervisor. (CCC)
8. Backwash rate curves to correspond with the product, which is installed. (CCC)

2. PRELIMINARY REQUIREMENTS

Customer should contact their Calgon Carbon Technical Sales Representative ten (10) working days prior to the date they plan to begin the exchange or installation. Subsequent to this notification, Calgon Carbon operations supervisor will work with the customer to reconfirm the start date and determine the equipment required to do the exchange.

3. SPENT REMOVAL - EDUCTION TO BULK TRAILER

1. Prior to spent carbon removal from the filter, the customer must isolate the filter from the treatment mode, complete a backwash, and lower the water level just below the top of the carbon bed so freeboard measurements can be taken.
2. While the filter is being backwashed, Calgon Carbon's supervisor will direct the connection of hoses, eductor and water supply.
3. Take free board measurements, then add water to the filter to a level of 12" to 24" of water above the carbon.
4. The driver prepares his truck to receive the spent carbon by installing a transfer hose to the front of the dump bed and a carbon retention screen on the chute and hooking up a drainage bib to the tailgate (if required) to catch all the water and direct it to a designated drain.
5. The suction hose with a wand is used for removing spent carbon. During carbon removal the operator will be required to add water into the filter to maintain a water level.
6. When it is determined that all the carbon has been removed, backwash the filter for a short amount of time, then take measurements of bed depth to determine if additional material should be removed.
7. When the removal is complete, free board measurements are again taken. Water is added to the filter to a level of 12" to 24" above the sand.

4. CARBON FILL - EDUCTION FROM A BULK TRAILER

1. The virgin carbon trailer is positioned and set up with Calgon Carbon equipment to educt the carbon into the empty filter. Calgon Carbon Corporation Safe Job Procedure OP-5 (attached) will be used to transfer carbon with an aluminum hopper.
2. After the proper carbon level has been installed, the filter should sit overnight in a flooded state and then be backwashed prior to going on line.

If the filter must go into service immediately, a backwash must be completed. The backwash should begin at a low flow rate and be increased gradually to complete the backwash. A backwash removes any entrapped air or carbon fines, and segregates the carbon bed. The rates are determined by water temperature and are found on product bulletins supplied by Calgon Carbon Corporation.

3. Final freeboard measurements are taken after the backwash has been completed to verify that the proper amount of carbon has been installed.
4. All measurements are recorded on Calgon Carbon's removal/installation certificates and are to be signed by the customer as well as the Calgon Carbon Supervisor upon completion of each filter.
5. The procedure is repeated for each filter to be exchanged.
6. After the total job is complete, all equipment must be returned to Calgon Carbon Corporation, and the work area cleaned up before leaving the site.

5. CARBON FILL - EDUCTION FROM SUPERSACKS

This method is similar to the method described in part D except as follows:

1. Use the free-standing hopper instead of the truck mounted hopper.
2. A crane or fork truck is necessary to bring super sacks from the storage area to the hopper.

6. CARBON FILL USING CRANE AND SUPERSACKS

1. The carbon will be furnished in 1,000-pound super sacks. The super sacks have an 18" discharge chute, and are stacked two (2) high with a pallet under the bottom super sack.
2. Sufficient storage for the super sacks shall be provided. The recommended storage area is an enclosed building. If this is not available and the carbon is stored outside for an extended period of time, the super sacks should be covered with tarpaulins or plastic and kept away from the areas which have inadequate drainage to prevent submersion of any carbon in free-standing water.
3. Add 12" to 24" of water to the filter.
4. A crane can be used to dump the carbon from the super sacks directly into the filter. Continue to add water to keep the carbon submerged.
5. After the proper carbon level has been installed, the filter should sit overnight in a flooded state and then be backwashed prior to going on line.

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FIELD SERVICE STANDARD OPERATING PROCEDURES

Implementation Date:	5/9/2014	Last Reviewed/Updated:	5/9/2014
Revision Date:	Rev 0	Prepared by:	H. Ruddy
Approved by:	Eric R. Makar – Regional Manager		
SOP #	FS.SOP.4.8 – Filter Disinfection using Sodium Hypochlorite		

PURPOSE

To remove any bacteria(s) and/or other contaminants that may be present.

SCOPE

This policy is applicable to all Field Service employees when performing a filter disinfection using 12.5% Sodium Hypochlorite (NaOCl) Liquid Bleach.

DEFINITIONS

Short Term Exposure Limit (STEL): is defined by ACGIH as the concentration to which workers can be exposed continuously for a short period of time without suffering from irritation; chronic or irreversible tissue damage; and narcosis.

Chronic health effect: is an adverse health effect resulting from long-term exposure to a substance. The effects could be skin rash; bronchitis; cancer; or any other medical condition.

Irritant: a chemical, which is not corrosive, but causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

CHEMICALS

- Sodium Hypochlorite 12.5% Solution (Bleach)

EQUIPMENT

- Free Chlorine Water Test Kit (Industrial)

PPE

- ☒ Full-Face Respirator w/organic vapor cartridge(s)
- ☒ Steel Toe Boots
- ☒ Tyvex Coveralls w/hood and feet
- ☒ Rubber Chemical Gloves

HAZARDS

- ☒ Inhalation
- ☒ Skin Contact - burns, blisters, itching
- ☒ Eye Irritant irritation

SAFE WORK PRACTICES

- Exhaust ventilation system is recommended; sufficient to remove chlorine odor;
- Exposure limits 2mg/m3 AIHA recommended STEL 15 minutes; and

FIELD SERVICES STANDARD OPERATING PROCEDURES

- Locations of eyewash stations must be located within 10 seconds, roughly 55 feet of all Emergency eye wash fountain and quick drench shower.

PROCEDURE

1. Calculate the amount of water used by measuring the dimensions of each filter bay.

Length (L): _____

Width (W): _____

Height of Water (H): _____

Multiply the above values together to obtain the overall cubic feet of water.

$$\text{Example: } 25 \text{ FT (L)} \times 25 \text{ FT (W)} \times 10 \text{ FT (H)} \\ = 6,250 \text{ Cubic Feet}$$

Next, multiply by 0.001476 to obtain the number of gallons of 12.5% (NaClO) needed.

$$6,250 \text{ Cubic Feet} \times 0.001476 \\ = 9.2 \text{ Gal} \\ = 10 \text{ Gal}$$

$$L \times W \times H \times 0.001476 = \text{_____ gallons of 12.5\% NaClO (round-up to nearest gallon)}$$

After all the granular activated carbon has been removed and before reinstallation; fill the entire filter basin up the maximum water level, and then disinfect by the following method:

1. Inject sufficient chlorine into the backwash water (or continuously inject into the filter influent water while filtering to waste) to produce a free chlorine residual of at least 25 mg/L throughout the filter.
2. Use the Sodium Hypochlorite (NaClO) at a concentrate of 12.5% for chlorination.
3. Use the chlorine test strip to measure the concentration to ensure the water meets the required 25 mg/L.
4. The chlorinated water should stand in the filter for a minimum of 12 hours.
5. At the end of 12 hours, use a new test strip to determine the amount of free chlorine residual in the water.
 - a. The free residual should be more than 15mg/L.
 - b. If the concentration is less 15 mg/L, the chlorination process must be repeated until the concentration exceeds 15 mg/L.
 - c. Sufficient tests should be made both from the top and bottom of the filter (and at intermediate points if feasible).

FIELD SERVICES STANDARD OPERATING PROCEDURES

6. If satisfactory chlorine residuals are obtained after the chlorine retention period, backwash the filter thoroughly to remove the highly chlorinated water.
7. The granular activated carbon is ready to be reinstalled and the filter can be placed back in service.

FIRST AID MEASURES

Eye Contact

Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains, at least 15 minutes. Continue irrigating with normal saline solution until ready to transport to a physician. Cover with a sterile bandage.

- Locations of eyewash stations must be located within in 10 seconds (roughly 55 feet) of all hazardous, particulate, or corrosive material;
- Eyewash stations must provide a minimum of 15 minutes of continuous flushing. (eyewash bottles cannot substitute an eyewash station)
- All employees who work with hazardous, particulate, and corrosive material shall be trained on the locations and proper operations of eyewash and shower stations.

Skin Contact

Remove contaminated clothing and shoes immediately. Flush affected area with large amounts of water, preferably a safety shower. Use soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). For burns, cover affected area securely with sterile, dry, loose fitting dressing. If skin is burned, get medical attention immediately.

Inhalation

Remove from exposure and get fresh air. Use bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Keep warm and at rest. Get medical attention immediately if artificial respiration required.

TRAINING

This policy is part of the Field Service new hire orientation and will be communicated following any changes.

PROGRAM AUDIT/REVIEW

This policy will be evaluated annually by Field Service Management and updated as needed. Calgon Carbon's American Safety Council will evaluation and review any reported accidents, as well as near misses, to identify areas where additional safety measures need to be taken.

FIELD SERVICES STANDARD OPERATING PROCEDURES

Field Service management will conduct periodic reviews of this policy to determine the effectiveness of the program by:

- Conducting employee behavior based safety audits;
- Performing a worksite hazard identification and risk analysis; and
- Interviewing employees to determine whether they are familiar with the requirements of this program and if safety measures are being practiced.

CORRECTIVE ACTIONS

When necessary, Calgon Carbon reserves the right to discipline employees who knowingly violate company safety rules or policies. Compliance with all safety rules and procedures are a condition of employment. Disciplinary measures will include, but are not limited to:

- Verbal warning (documented) for minor offences.
- Written warning for more severe or repeat violations.
- Suspension without pay, if verbal and written warnings do not prove to be sufficient.

FILTRASORB® 400

Granular Activated Carbon

Description

FILTRASORB 400 is a granular activated carbon developed by Calgon Carbon Corporation for the removal of dissolved organic compounds from water and wastewater as well as industrial and food processing streams. These contaminants include taste and odor compounds, organic color, total organic carbon (TOC), and industrial organic compounds such as TCE and PCE. This activated carbon is made from select grades of bituminous coal through a process known as reagglomeration to produce a high activity, durable, granular product capable of withstanding the abrasion associated with repeated backwashing, hydraulic transport, and reactivation for reuse. Activation is carefully controlled to produce a significant volume of both low and high energy pores for effective adsorption of a broad range of high and low molecular weight organic contaminants. FILTRASORB 400 is also formulated to comply with all the applicable provisions of the AWWA Standard for Granular Activated Carbon (B604), the stringent extractable metals requirements of ANSI/NSF Standard 61, and the Food Chemicals Codex.

Features

- Calgon Carbon's reagglomerated coal-based granular activated carbons have several properties which provide superior performance in a wide range of applications.
- Produced from a pulverized blend of high quality bituminous coals resulting in a consistent, high quality product.
- The activated carbon granules are uniformly activated through the whole granule, not just the outside. This results in excellent adsorption properties and constant adsorption kinetics in a wide range of applications.
- The reagglomerated structure ensures proper wetting while also eliminating floating material.
- High mechanical strength relative to other raw materials, thereby reducing the generation of fines during backwashing and hydraulic transport.
- Carbon bed segregation is retained after repeated backwashing, ensuring the adsorption profile remains unchanged and therefore maximizing the bed life.
- Reagglomerated with a high abrasion resistance, which provides excellent reactivation performance.
- High density carbon resulting in a greater adsorption capacity per unit volume.

Specifications

FILTRASORB 400

Iodine Number	1000 mg/g (min)
Moisture by Weight	2% (max)
Effective Size	0.55 - 0.75 mm
Uniformity Coefficient	1.9 (max)
Abrasion Number	75 (min)
Screen Size by Weight, US Sieve Series	
On 12 mesh	5% (max)
Through 40 mesh	4% (max)

Typical Properties*

FILTRASORB 400

Apparent Density	0.54 g/cc
Water Extractables	<1%
Non-Wetttable	<1%

*For general information only, not to be used as purchase specifications.

Recycling by Thermal Reactivation

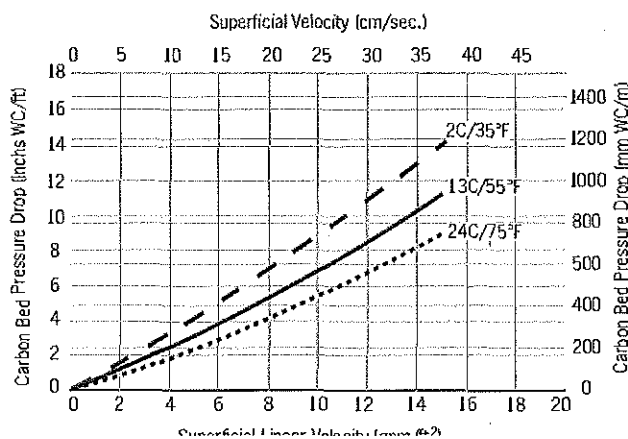
After a granular activated carbon's adsorptive capacity has been exhausted, it can be returned to Calgon Carbon for thermal reactivation. The thermal reactivation process involves a high temperature reaction with steam, which destroys the adsorbed organic compounds and restores the adsorptive capacity of the activated carbon.

Through reactivation, the spent activated carbon can be recycled for reuse, eliminating the costs and long-term liability associated with disposal of spent GAC. The benefits of a reactivated product over a virgin carbon are several, including economic, as reactivated GAC cost less than virgin GAC and environmental, as reactivated GAC conserves natural resources and reduces CO₂ emissions compared to the manufacture of virgin GAC. A further benefit of reactivating and reusing spent granular activated carbon is the ability for customers to ensure for themselves a reliable supply of media when needed, as the spent/reactivated carbon represents a renewable resource.

FILTRASORB 400 is designed with high mechanical strength and a dense, fully-developed pore structure to ensure low losses throughout the reactivation process and excellent adsorption performance upon reuse.

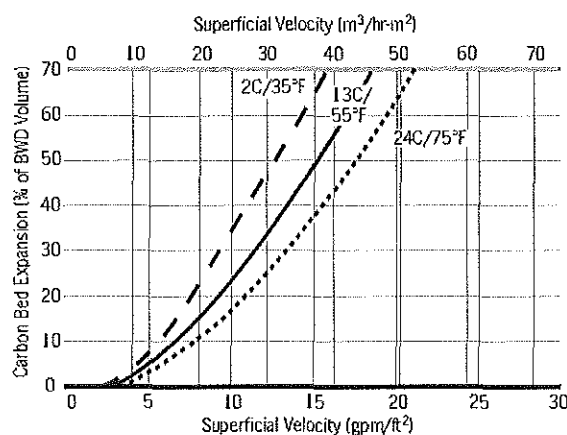
Pressure Drop

Based on Backwashed and Segregated Bed



Bed Expansion

Based on Backwashed and Segregated Bed



Applications

FILTRASORB 400 activated carbon can be used in a variety of liquid phase applications for the removal of dissolved organic compounds. FILTRASORB 400 has been successfully applied for over 40 years in applications such as drinking and process water purification, wastewater treatment, and food, pharmaceutical, and industrial purification.

Design Considerations

FILTRASORB 400 activated carbon is typically applied in down-flow packed-bed operations using either pressure or gravity systems. Design considerations for a treatment system is based on the user's operating conditions, the treatment objectives desired, and the chemical nature of the compound(s) being adsorbed.

Packaging

55 lb. (25 kg) poly bag
1,000 lb. (454 kg) super sack
Bulk truck

Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable federal and state requirements. Please refer to the MSDS for all up to date product safety information.

Filtrisorb is 100% freshly manufactured virgin granular activated carbon. Recycled granular activated carbon is not used in the production of Filtrisorb.

Making Water and Air Safer and Cleaner

www.calgoncarbon.com



Corporate Headquarters
Calgon Carbon Corporation
500 Calgon Carbon Drive
Pittsburgh, PA USA 15205
800.422.7266
412.787.6700
412.787.6713 Fax

www.calgoncarbon.com

European Operations
Chemwiron Carbon Corporation
Zoning Industriel C de Feluy
B-7181 Feluy, Belgium
+32 (0) 64 51 18 11
+32 (0) 64 54 15 91 Fax

Asia Operations
Calgon Carbon Asia Pte Ltd.
9 Temasek Boulevard
#26-02 Suntec Tower Two
Singapore 038989
+65 6221 3500
+65 6221 3554 Fax

Your local representative

CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR
CITY OF FLINT WATER TREATMENT PLANT
PHASE II, SEGMENT 3 – FILTER MEDIA REPLACEMENT
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City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 02540
CHEMICAL PIPING

PART 1 - GENERAL

1.01 Summary

This section governs the material, pipe, fittings, connections, butt fusion and general construction practices for all chemical piping.

1.02 References

- A. AWWA C110-08 Ductile Iron and Gray Iron Fittings
- B. AWWA C906-07 – Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In., for Water Distribution and Transmission.
- C. AWWA C207-07 – Steel Pipe Flanges for Waterworks Service – Sizes 4 In. Through 144 In.
- D. ASTM D-1784 – Rigid Poly (Vinyl Chloride)(PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- E. ASTM D-2837 – Standard Test method for Obtaining Hydrostatic Design basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
- F. ASTM D-2846 - Chlorinated Poly (Vinyl Chloride) (PVC) Plastic Hot and Cold Water Distribution Systems
- G. ASTM D-3261-03 – Butt Heat Fusion for Polyethylene Plastic Pipe and Fittings
- H. ASTM D-3350 – Polyethylene Plastics Pipe and Fittings Materials
- I. ASTM F-439 – Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- J. ASTM F-441 – Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
- K. ASTM F-2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

1.03 Related Work

- A. Section 02550 – Chemical Piping Valves
- B. Section 02560 – Pipe Testing

1.04 Pipe Packaging, Handling and Storage

- A. The manufacturer shall package the pipe in a manner designed to deliver the pipe to the project neatly, intact and without physical damage. The transportation carrier shall use appropriate method and intermittent checks to ensure the pipe is properly supported, stacked and restrained during transport such that the pipe is not nicked, gouged or physically damaged.
- B. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The handling of the pipe shall be done in such a

manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.

- C. Sections of pipe having been discovered with cuts or gouges in excess of 5 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt-fusion joining method.
- D. Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers must be avoided. Nylon slings are preferred. Spreader bars are recommended when lifting long fused sections. Care must be exercised to avoid cutting or gouging the pipe.

PART 2 - PRODUCTS

2.01 Manufacturers – the list of manufacturers below does not imply pre-approval of any product. All products must meet the requirements of this specification and be approved by the Engineer.

A. HDPE and CPVC Pipe

- 1. IPEX Inc,
- 2. Harvel Plastics Inc.
- 3. Charlotte Pipe and Foundry / Cresline Plastic Pipe Company
- 4. Spears Manufacturing
- 5. Harrison Plastics Corp.
- 6. Asahi / America

B. HDPE Dual Containment Pipe

- 1. Asahi / America

2.02 Materials

A. Pipe and Fittings

- 1. Chemical resistance data shall be provided for all plastic piping.
- 2. High Density Polyethylene (HDPE) – Single wall
 - a. All polyethylene pipe and fittings shall be in accordance with AWWA C906-07 from material having Standard PE code designation of PE 4710 and intended for use in the transportation of chlorinated water with a chlorine concentration of up to 2,000 ppm.
 - b. All HDPE pipe shall be black with UV stabilizer. Submit product data.
 - c. At the time of product submittal for approval, the supplier shall have enclosed an Affidavit of Compliance certifying that the pipe products furnished by him meet with all above standard requirements. Furthermore, polyethylene compounds shall be tested and certified as suitable for use with chlorinated water, in concentrations as listed, by an independent accredited testing agency.
 - d. The pipe and fitting manufacturer shall also supply certification that samples of this product have undergone stress regression testing, evaluation, and validation in accordance with ASTM D-2837 and PPI TR-3.

- e. Pipe and fittings shall be produced by the same manufacturer from identical materials meeting the requirements of this specification.
- f. Single wall HDPE Pipe and fittings shall be of 160 psi minimum pressure class, size and SDR as shown on the plans. If SDR is not shown stated on the plans, the minimum pipe thickness shall be SDR 11.
- g. Flanged connections, where shown, shall be supplied with 316 stainless steel lap joint flanges meeting AWWA C207D specifications, and joined with 5/8" diameter 316 stainless steel bolts, washers and nylon inserted locking nuts of the specified size. The stainless steel bolts shall have adequate thread length to assure proper joint seal.
- h. Dual Containment HDPE Piping and Fittings
 - i) Asahi Chem Prolok
 - a) PE 100-PC resin
 - b) HDPE material as per ASTM 3350
 - ii) Size and wall thickness ratings as shown on the plans. If thickness is not shown on the plans, pipe shall have the following minimum wall thicknesses: containment pipe - SDR 13.5, and carrier pipe - SDR 11.
 - iii) All pipe and fittings rated for minimum pressure of 150 psi at 68 degrees F.
 - iv) Manufacturer's data shall be submitted for dual containment pipe that adequately demonstrates that the pipe is suited for horizontal directional drill installation.
 - v) Pipe Centralizers
 - a) Full round centralizers thermally bonded to carrier pipe.
 - b) Spacing shall be per Plastic Piping Institute standards.
 - c) Molded or machined from HDPE pipe grade resins or sheet.
 - d) At least 2 openings per centralizer to permit fluid flow.
 - e) Centralizers shall uniformly maintain position of carrier pipe within the containment pipe.
 - f) OD of the centralizer shall meet the ID of the containment pipe.
 - g) End termination fittings shall be used where shown on the plans to provide transition to single wall pipe.

3. CPVC

- a. All CPVC pipe shall be manufactured from a Type IV, Grade I Chlorinated Polyvinyl Chloride (CPVC) compound with a minimum Cell Classification of 23447 per ASTM D1784.
- b. CPVC pipe shall conform to the requirements of ASTM F-441 chlorinated polyvinyl chloride plastic pipe, Schedule as shown on the plans. The pipe shall be manufactured in strict compliance to ASTM F441, consistently meeting the Quality Assurance test requirements of this standard with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be produced in the USA using domestic materials, by an ISO 9001 certified manufacturer, and shall be stored indoors after production, at the manufacturing site, until shipped from factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for

potable water applications. The pipe shall have a Flame Spread rating < 25 and a Smoke Development rating < 50 when tested and listed for Surface Burning Characteristics in accordance with CAN/ULC-S102-2-M88 or equivalent.

- c. Fittings shall conform to the requirements as outlined in ASTM F-439 for Schedule 80 socket type fittings.

4. Gaskets

- a. All flanged joints, except as otherwise specified, shall be made with rubber gaskets, full face. They shall conform to Appendix A of AWWA C110-08.

PART 3 - EXECUTION

3.01 Installation

- A. Installation practices, including support spacing, butt fusion and solvent welding, shall be in compliance with the manufacturer's printed recommendations.
- B. HDPE piping manufacturer shall provide written butt fusion procedure and requirements.
- C. Butt fusion heating requirements for dual containment piping shall be based on the thicker of the two pipes.
- D. The contractor shall install a sufficient number of unions for ease of disassembly as recommended by the manufacturer's printed recommendations.
- E. Curving HDPE pipe shall not exceed minimum manufacturer's recommendations. In general, bending radius shall not be less than 40 times the pipe OD.
- F. Dual wall piping manufacturer's representative shall provide up to 1 day on-site training for water treatment plant staff.

3.02 Testing

- A. CPVC and/or single wall HDPE pipe shall be tested as per the requirements of Section 02560 Pipe Testing.
- B. HDPE Dual Containment Pipe - Test as per ASTM F 2164 and Section 02560 Pipe Testing.

3.03 Joining

- A. All CPVC socket type connections shall be jointed with CPVC solvent, having a minimum viscosity of 2000 cps; as Type 80-c cement. Submit manufacturer's data for approval.
- B. Except where flange connections are specifically shown, HDPE pipe and fittings shall be butt fusion joined in accordance with the manufacturer's recommended procedure. Threaded or socket type connections will not be accepted. The pipe and fitting manufacturer shall provide fusion training services for field construction and inspection personnel.
- C. Only an agent of the manufacturer of dual containment pipe or operator properly trained for dual containment pipe thermal welding shall perform the welding.

*** END OF SECTION ***

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 02550
CHEMICAL PIPING VALVES

PART 1 - GENERAL

1.01 Work Included

- A. Chemical piping valves and accessories for buried, exposed, submerged and other types of piping, except where included in other Sections.
- B. Coordination: Review installation procedures under other Sections and coordinate with the Work which is related to this Section, including buried piping installation, exposed piping installation, plumbing, etc.

1.02 Related Work

- A. Section 02540 – Chemical Piping

1.03 References (latest editions)

- A. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
- B. ASTM A48 - Gray Iron Castings.
- C. ASTM A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- D. ASTM D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- E. ASTM D2467 - Socket-type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- F. ASTM F437 - Threaded Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.
- G. ASTM F439 - Socket-type Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.

1.04 Quality Assurance/Quality Control – Manufacturer's Qualifications

- A. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least five (5) years.
- B. Insofar as possible, all valves of the same specific type shall be the product of one (1) manufacturer.

1.05 Submittals

Submit shop drawings and product data as per the requirements below:

- A. Valve Manufacturer Submittals: Submit for review detailed drawings, data and descriptive literature on all valves and appurtenances, including:

1. Dimensions.
 2. Size.
 3. Materials of construction.
 4. Weight.
 5. Protective coating.
- B. Manufacturer's Certifications: Submit manufacturer's certificates of compliance with ANSI, AWWA and other Standards listed herein.
- C. Manufacturer's Service Report:
1. Certify that valves are properly installed except as noted.
 2. Recommend corrective action for any deficiencies noted.
- D. Submit a detailed operation and maintenance manual for all valves and appurtenances provided under this Section, including the following information:
1. Product name and number.
 2. Name, address and telephone number of manufacturer and local distributor.
 3. Instruction bulletins for operation, maintenance and recalibration.
 4. Complete parts and recommended spare parts lists.
- 1.06 Valve Delivery, Handling and Storage
- A. Deliver products to site under provisions of Section 01600.
 - B. Store and protect products under provisions of Section 01600.
 - C. Valves and appurtenances which are cracked, chipped distorted or otherwise damaged or dropped will not be acceptable.
 - D. Store all valves and appurtenances off the ground in enclosed shelter.

PART 2 - PRODUCTS

2.01 General

- A. Valves shall be installed as shown on the Contract Drawings and as otherwise necessary to provide a safe, convenient, flexible and economical control of all piping systems and their related equipment.
- B. Valves 4" and larger equipped with flanged joints shall be in conformity with the current ANSI B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", Class 250 drilling.
- C. Valves and unions or flanges shall be provided at each individual connection to each piece of equipment to permit complete servicing or removal of each item and drainage of pipe systems. Valves shall be provided for all branch lines; unless otherwise indicated or specified, all valves less than 4" shall be provided with threaded connections.

- D. Dual contained valves provided by the piping manufacturer shall be supplied pre-assembled and tested to 150% of the maximum operating pressure. Actuators, stem extensions and accessories shall be part of the preassembled package.

2.02 Ball Valves, 4" and smaller

A. Manufacturers:

- 1. Asahi or approved alternative

B. Materials:

- 1. CPVC Type IV, Cell Classification 23447HDPE
- 2. O-Rings: EPDM or FKM
- 3. All valves shall have polypropylene handle.

C. Rated Working Pressure:

- 1. 150 psi at 68° F.

PART 3 - EXECUTION

3.01 Installation

- A. Install valves and specialties in accordance with manufacturer's recommendations and instructions to permit intended performance.
- B. Extreme care shall be used in the handling, storage and installation of equipment to prevent damage or distortion of the equipment and to ensure proper performance.

3.02 Testing

- A. All valves shall be given hydrostatic shop pressure test in accordance with applicable AWWA standard specified. The valves shall be tested, first by applying the hydrostatic pressure with the valve open, and then with the valve closed. The valves shall be tight and secure under the test pressure.
- B. Valves and specialties shall be tested in place by the Contractor, and any defects in valves, specialties or connections shall be correct to the satisfaction of the Engineer.

3.03 Identification of Valves

- A. Each shutoff or control valve installed inside the plant, valve vault, out building or other accessible area (except those provided as a component of a specific equipment item) shall be provided with a 1-1/2" minimum diameter heavy brass tag.
- B. Each tag shall have a unique identifying alpha-numeric code identifying the valve type and service, as approved by the Engineer.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

**SECTION 02560
PIPE TESTING**

PART 1 - GENERAL

1.01 Section Includes

- A. Testing of all piping, as specified.
- B. Pipelines to be Tested:
 - 1. Chemical Feed piping
 - 2. All other new piping not specifically listed above.

1.02 Related Sections

- A. Section 02540 – Chemical Piping
- B. Section 02550 – Chemical Piping Valves

1.03 Quality Assurance

All equipment, devices, and tools required for testing of piping systems shall be provided by Contractor and shall be of first class construction designed to perform the required service.

1.04 Submittals

Contractor shall submit for review his test procedures for each pipeline to be tested. Provide list of equipment and materials to be used during each test, including size, capacity, manufacturer, model numbers, and all necessary appurtenances.

PART 2 - PRODUCTS

2.01 Testing Equipment

- A. All testing equipment, including meter or measuring facilities shall be furnished by Contractor, and shall be subject to the Owner's approval.
- B. Contractor shall pay for all water necessary to complete testing.

PART 3 - EXECUTION

3.01 General

- A. Test all piping as specified herein except as otherwise authorized by the Engineer.
- B. Notify the Engineer 48 hours in advance of testing.
- C. Provide all testing apparatus, including pumps, hoses, gages and fittings.

- D. Pipelines shall hold the specified test pressure for a period of one (1) hour unless noted otherwise.
- E. Repair and retest pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate.
- F. Conduct all tests in the presence of the Engineer unless otherwise approved.
- G. Contractor shall perform all specified testing.

3.02 Pressure and Leakage Tests Procedures

A. Exposed Piping, Interior Piping, and HDPE Pipe

1. Ensure that all supports, restraints, and pipe protection features are securely in place.
2. Section to be tested shall be slowly filled with water to allow for escape of entrapped air. Install corporation stops as necessary for removal of air.
3. Test only 1 pipeline section at a time.
4. Apply test pressure of 150 psi for two (2) hours and observe pressure gage. Carefully check for leaks while test pressure is being maintained.
 - a. Examine exposed pipe, joints, fittings and valves. Stop visible leakage or replace the defective pipe, fitting or valve.
 - b. Pump water into the line with the test pump to maintain the specified test pressure for a one-hour period.
 - c. All repair, replacement, and retesting required because of failure to meet test requirements shall be made by Contractor.
5. Allowable Leakage Rates: No leakage permitted.
6. Leakage Test shall be repeated following corrective work until a satisfactory test is achieved.

B. HDPE Dual Containment Pipe

1. Carrier Pipe: Hydrostatic test as per Part 3.02 (C) above.
2. Containment Pipe
 - a. Air test at 10 psi over 10 minutes with no allowable pressure drop.
 - b. Perform air test with carrier pipe full of water and pressurized to at least 20 psi to avoid collapse.

3.03 Cleaning

All piping shall be thoroughly cleaned and flushed in a manner approved by Engineer prior to being placed into service.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 05550
BOLTS, ANCHOR BOLTS AND EXPANSION ANCHORS

PART 1 - GENERAL

1.1 SUBMITTALS

Submit the following information for review. Do not begin fabrication until after submittals have been reviewed.

A. Manufacturer's Product Data. Manufacturer's product data shall contain sufficient information to evaluate conformance to specifications and produce suitability for intended use. Submit test reports from accredited independent testing laboratories where specified. Submit manufacturer's product data for the following products:

1. Expansion Anchors. Certified pullout and shear capacities shall be included in the submittal.
2. Standard cast products.

1.2 SUBSTITUTIONS

Substitution of rolled sections, details or products is not permitted without prior written approval. If items shown or specified are not readily obtainable, permission to substitute for the specified item may be requested by the Contractor. Substitutions may be allowed on items of equal or superior properties which conform to design criteria.

1.3 CODE REQUIREMENTS

Design of steel fabrications shall conform to the requirements of AISC Specifications for Structural Steel for Building, Allowable Stress Design (Current Edition).

1.4 INSPECTION AND TESTING

The materials and workmanship covered in this specification may be inspected by the Owner, the Engineer or the Owner's designated testing laboratory. The testing laboratory will be employed and paid by the Owner as specified in Section 01380, Quality Control. Inspection may be performed in the mill, shop or field as deemed necessary. Inspection in no way relieves the Contractor from his responsibility to furnish satisfactory materials. The right to reject material at any time before final acceptance is reserved, if material and workmanship do not conform to drawings and specifications.

1.5 DELIVERY AND STORAGE

Schedule material delivery so that items may be erected promptly after arrival. If materials must be stored at the project site, they shall be stored aboveground on platforms, skids or other supports. Material stored at the site shall be kept free of dirt, mud, grease or oil. Protect stored material from corrosion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bolts, Studs, Nuts and Washers.

1. General

- a. Bolt heads shall be marked with manufacturer, ASTM material designation/grade, and country where manufactured. Markings shall be raised or depressed.

b. At joint harnesses and restrained harnesses connected to flanges, the tie bolts and studs, flange bolts and nuts shall be in conformity with the current ASTM A193, Grade B7 and ASTM A194.

c. For pipe joints, bolt strength shall be adequate to provide compression needed for water tightness of the gasket material used.

2. Buried Conditions

a. Corrosion Resistant Steel (CRS) CRS anchor bolts, flange bolts, and studs shall be "Cor-Ten" type steel and shall conform to ASTM A325 Type 3 weathering steel with minimum tensile strength of 105 ksi. Type 3 bolts shall be marked A325. Nuts shall be in conformance with ASTM A563 Grade C3.

b. At buried mechanical joints, bolts and nuts shall be in conformance with all of AWWA C111 dimensions and requirements. Bolts and nuts shall be tension tested for a minimum ultimate tensile stress of 65 ksi using testing procedures corresponding to ASTM A307 requirements, and shall be proof load tested based on 45 ksi stress to AWWA C111 standards.

3. Exposed or Submerged Conditions.

a. Stainless Steel. Type 316 conforming to ASTM A193 Grade B8M, Class 2 with ASTM A194 Grade 8M stainless steel nuts and washers.

4. Other as Specified

a. Carbon Steel. Conform to ASTM A325, with suitable nuts and washers, as noted on the drawings. Washers bearing on metal shall be cast steel. Where type is not noted on the drawings, provide ASTM A325. Use carbon steel bolts where indicated on the drawings.

b. Stainless Steel. Where specified or indicated on the drawings as "stainless steel," "SS" or "stn. steel," Bolts shall be Type 304 conforming to ASTM A193 Grade B8M, Class 2 or 2B with ASTM A194 Grade 8 stainless steel nuts and washers or meet 3 (a) above.

B. Anchor Bolts.

1. Carbon steel anchor bolts shall be galvanized threaded rods conforming to ASTM A307, except where shown or specified otherwise, with suitable heavy hex nuts and oversize washers. Anchor bolts and nuts shall be tapped or chased after galvanizing. Use carbon steel anchor bolts except where noted otherwise on the drawings.

2. Stainless steel anchor bolts shall be Type 304 conforming to ASTM A193 Grade B8. Use stainless steel anchor bolts where shown on the drawings as "stainless steel," "stn. steel" or "SS." Provide stainless steel anchor bolts with suitable stainless steel nuts and oversize washers.

3. Provide anchor bolts for all equipment and machinery when anchor bolts are not furnished by the manufacturer. Anchor bolt type, size, length, projection, etc., shall conform to the requirements of the equipment and machinery manufacturer.

4. Provide templates to accurately position the anchor bolts in the forms.

C. Concrete Expansion Anchors.

1. Provide drilled-in concrete expansion anchors, which are externally threaded edge type expansion bolt anchors complete with washers and nuts. The anchors shall conform to Federal Specification FF S 325, Group II, Type 4, Class 1 concrete expansion anchors.

2. Carbon Steel Expansion Anchors. Not allowed.

3. Stainless Steel Expansion Anchors. Provide stainless steel expansion anchors conforming to AISI Type 316.

4. The expansion anchors shall have minimum ultimate capacity when tested in accordance with ASTM E 488 in 4,000 psi concrete as follows:

Stainless Steel:

Bolt Size	1"	3/4"	5/8"	1/2"
Minimum Shear Strength*	28,000#	18,000#	12,500#	8,340#
Minimum Pullout Strength	27,000#	14,500#	11,000#	8,000#
Minimum Embedment	6"	4-3/4"	4"	3-1/2"

*Shear plane through the anchor bolt shank.

5. Expansion anchors shall be installed in accordance with the manufacturer's recommendations.
6. A list of standard materials used in the manufacturer of the anchor components, including designated material specification (AISI, ASTM, etc.), as well as pullout and shear values attained from tests performed by a certified independent testing laboratory in accordance with ASTM E 488, shall be submitted to the Engineer for review. The submittal shall also include the manufacturer's installation instructions.

PART 3 - EXECUTION

3.1 CONDITION OF SURFACES

- A. Prior to installation, inspect surfaces to which miscellaneous metal items will be attached. If the condition of the surface is such that it will adversely affect installation, do not proceed with installation until corrective measures have been taken.
- B. Verify that aluminum surfaces that will be in contact with concrete or steel have been coated as specified

3.2 INSTALLATION

- A. Accurately set work to established lines and elevations and securely fasten in accordance with approved shop drawings and provisions of this section.
- B. The Contractor shall be fully responsible for furnishing and installing any temporary braces, ties or shoring necessary to hold secure and safe all items under the action of wind and erection loads imposed thereon until construction is completed.
- C. Prior to placement of concrete, set concrete inserts (e.g. anchor bolts) in proper location and provide necessary anchorages or restraints to prevent movement of inserts during concrete placement.
- D. For stainless steel bolting, apply anti-sieze compound liberally to bolt threads and face of nuts to prevent galling.
- E. Follow manufacturer's installation instructions for concrete expansion anchors.

3.3 ERECTION OF STEEL ITEMS

Erection of steel items must conform to AISC specification, Structural Steel for Buildings. Field-fabricated bolt holes, when required, shall be drilled; or as an alternate, they may be flame-cut undersize and reamed to correct size.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 09928
PROTECTIVE COATING SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. All labor, materials, equipment, transportation, supervision, tools, and services necessary for the surface preparation and field painting of exposed steel surfaces; including structural steel, equipment, piping, conduits, and all appurtenances and miscellaneous items

B. All mechanical equipment shipped without a finish coat shall be field painted prior to installation.

1.2 RELATED WORK

A. Work under this Section is also subject to the requirements specified in Divisions 0 and 1 of these Contract Documents:

B. Section 01330: Submittal Procedures.

C. Section 05120: Structural Steel

D. Section 05500: Metal Fabrications

E. Section 05510: Miscellaneous Metals

F. Section 05550: Bolts, Anchor Bolts, Expansion Anchors, and Concrete Inserts

1.3 REFERENCES

A. American National Standards Institute / American Society for Testing and Materials, ANSI / ASTM

1. ANSI / ASTM D16: Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. Ferrous Metal Standard: SSPC – Society of Protective Coatings

C. Cast and Ductile Iron Standard: NAF 500.

D. Recommended Standards For Water Works by Great Lakes Upper Mississippi River Board of State Public Health And Environment Managers.

E. Recommended Standards For Wastewater Facilities by Great Lakes Upper Mississippi River Board of State Public Health And Environment Managers.

F. International Concrete Repair Institute (ICRI)

1.4 DEFINITIONS

A. Conform to ANSI / ASTM D16 for interpretation of terms used in this Section.

Quality Assurance

B. Product Manufacturer: Company specializing in manufacturing quality paint and finish products intended for use in water/wastewater treatment plants with three (3) years of experience.

C. Applicator: Company specializing in water/wastewater treatment plant painting and finishing with three (3) years of experience.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

B. All coatings in the following categories shall meet the USEPA Federal Clean Air Act ruling, which becomes effective on September 11, 1999. All coatings specified in the technical specification sections shall be revised accordingly to meet these requirements. The main categories targeted for Volatile Organic Compound levels are as outlined below:

1.	Form Release Agents	(450 g/L)
2.	Primers / Undercoatings	(350 g/L)
3.	Bituminous Coatings / Mastics	(500 g/L)

1.6 SUBMITTALS

A. Submit in accordance with Section 01330

B. Product Data

1. Provide product data on finishing products.
2. Submit manufacturer's application instructions.
3. Submit samples in 1" x 2" size illustrating range of colors and textures available for each surface finishing product scheduled for selection.

C. Shop drawings shall include a listing of all items which the Contractor intends to paint, the paint materials designated for use on those specific items, color charts, and blank spaces to allow the Owner to insert their color selections for each item.

The color selections may be adjusted by the Owner and Engineer after a specific manufacturer of paint has been chosen by the Contractor, and the shop drawings have been reviewed by the Engineer. The Owner reserves the right to specify colors other than those stated in this Section, or as shown on the Drawings. It shall be the Contractor's responsibility to have the final color selections authorized by the Owner prior to ordering any paint materials.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and protect products in accordance with Section 01600.

B. Deliver products to site in sealed original labeled containers; inspect to verify acceptance.

C. Container labeling to include manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and / or reducing.

D. Store paint materials at a minimum ambient temperature of 45o F and a maximum of 90o F, in a well ventilated area, unless manufacturer's instructions have different requirements.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 ENVIRONMENTAL REQUIREMENTS

A. All paint shall be applied in accordance with the applicable manufacturer's printed data sheet and container label outlining recommended minimum and maximum surface and air temperatures required for application. Paint

shall not be applied to wet or damp surfaces and shall not be applied in rain, snow, fog or mist, or when the relative humidity exceeds 85%.

B. No paint shall be applied when it is expected that the relative humidity will exceed 85% and/or the air temperature will drop below recommended levels within 12 hours after paint application. Dew or moisture condensation should be anticipated, and if such conditions are prevalent, painting shall be delayed until certain that the surfaces are dry. Painting should be completed well in advance of the probable time of day when condensation will occur in order to permit the film an appropriate drying time prior to the formation of moisture on the surface.

C. Provide minimum lighting level of 15 foot-candles on surfaces to be finished.

1.9 EXTRA STOCK

A. Provide 1-gallon container, or small kit, of each type of paint color to owner.

B. Label each container with color, and room location, in addition to the manufacturer's label.

C. Containers shall be tightly sealed.

1.10 ITEMS TO BE PAINTED

A. General List: These lists are intended to provide an overview of work and there may be minor or specific exceptions noted on the Drawings or Specified in Appendix A – Itemized Painting Schedule.

1. All unit process equipment and their accessories. Equipment directly connected to color coded pipe shall be painted the same color as the pipe, or as specified in Appendix A – Itemized Painting Schedule.

2. All exposed piping, and appurtenances with associated hardware; including steel, ductile iron pipe, cast iron pipe, plastic, etc.

3. All exposed electrical conduits, brackets, etc. Properly prime galvanized surfaces as specified. Outdoor electrical apparatus and enclosures shall be coated in the same color as adjacent surfaces.

4. New building construction, including interior and exterior concrete masonry walls, all metal doors and frames, all drywall, and exposed wood.

5. All metal equipment and appurtenances not otherwise covered in the previous sections (except aluminum, chrome-plated and stainless items) shall be painted. Submerged items shall be painted black, unless otherwise indicated.

6. All aluminum, stainless steel, and other metal surfaces in contact with dissimilar metals shall be painted at the points of contact according to Appendix B to prevent contact between dissimilar metals. Aluminum in contact with concrete shall be coated per Appendix B to prevent direct metal contact to concrete.

7. All structural steel.

B. Excluded Items: Unless otherwise shown on the Drawings, or specified in other sections, the following is a general list of those surfaces not to be painted on-site or by the manufacturer.

1. Fiberglass Items.

2. Aluminum items, unless otherwise specified.

3. Stainless steel, unless otherwise specified.

4. Chrome Plating.

5. Pre-painted items.
6. Galvanized surfaces, excluding electrical conduits, unless otherwise specified.

C. Itemized Painting Schedule: In addition to the General List of items to be painted above, Appendix A - Itemized Painting Schedule at the end of this Section lists specific items to be painted as part of the Work. This schedule is not intended to be all inclusive, but is provided to indicate major equipment or other items of importance that are to be painted. The schedule does not relieve the Contractor's responsibility to provide a comprehensive list of items to be painted as part of the shop drawing submittal(s).

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Paint: Interior and Exterior

1. Tnemec Company
2. AkzoNobel (International Paint, LLC Devco Coatings)
3. Approved Alternative

2.2 MATERIALS

A. Coatings: Ready mixed, except field-catalyzed coatings.

1. Process pigments to soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coatings.
2. Good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified or commercial quality.

C. Provide best grade of various types of coatings scheduled as regularly manufactured by acceptable paint manufacturer. Products not displaying manufacturer's identification as "standard, best grade product," are not acceptable.

2.3 FINISH SCHEDULE

A. This schedule is not intended to include mention of every item requiring field painting, but is intended as a guide to finishing various surfaces throughout the project.

1. The Finish Schedule in Appendix B at the end of this Section is based, in general, on the products of Tnemec Company and AkzoNobel, and is the basis for standard of quality. The standard "or equal" clause shall apply.
2. Product substitutions shall be subject to the requirements of Section 01600. Each such request shall include the name of the specified material for which a substitute is being requested; the name of the proposed substitute material; and a complete description of the proposed substitute including performance and test data and any other information necessary for an evaluation.
3. The burden of proof of the merit of the proposed substitute is upon the Contractor. The decision of the Engineer/Owner regarding approval or disapproval of the proposed substitution shall be final.
4. Where products are proposed other than those specified by name and number in the Finish Schedule, provide submittal as required including product data sheets and performance criteria along with a new painting schedule in the same format included in this Section.

B. Undercoats:

1. Provide undercoat / primer paint produced by the same manufacturer as the finish coat.
2. Insofar as practicable, use undercoat / primer and finish coat material as part of a unified system of paint finish.

C. Provide all paint and materials supplied by one manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces base conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to the commencement of work.

1. Report all conditions that may adversely affect quality of the finished work prior to commencement of work.
2. Do not commence until such defects have been corrected.

C. Correct defects and deficiencies in surfaces, which may adversely affect work on this Section.

D. Beginning of installation means acceptance of existing surfaces and / or base.

3.2 PREPARATION OF SURFACES

A. Correct minor defects and clean surfaces which impact the work of this section.

B. Impervious Surfaces:

1. Remove mildew by power washing / scrubbing with a solution of trisodium phosphate (TSP) or bleach.
2. Rinse with clean water and allow surfaces to dry.

C. Preparation of Metal Surfaces

1. **SSPC-SP1 SOLVENT CLEANING:** The removal of dirt, oil, grease and foreign matter with solvents or commercial cleaners using various methods of cleaning such as wiping, dipping, steam cleaning or vapor degreasing. The removal of oil and grease by solvent cleaning is included in all other SSPC Surface Preparation Specifications.
2. **SSPC-SP2 HAND TOOL CLEANING:** The removal of loose rust and mill scale, or old paint by hand wire brushing, hand scraping, hand chipping or hand sanding.
3. **SSPC-SP3 POWER TOOL CLEANING:** The removal of loose rust and mill scale by mechanical means such as power sanders, wire brushes, chipping hammers, abrasive grinding wheels or needle guns.
4. **SSPC-SP4 FLAME CLEANING:** The dehydration of the surface by rapidly heating with a high temperature, high-velocity oxyacetylene flame followed by wire brushing and hand scraping to remove loose rust and mill scale.
5. **SSPC-SP5 WHITE METAL BLAST CLEANING:** The complete removal of all visible rust, mill scale, paint and foreign matter by compressed air nozzle blasting, centrifugal wheels or other specified method, leaving an overall, uniformly gray-white metallic appearance.

6. SSPC-SP6 COMMERCIAL BLAST CLEANING: The removal of at least sixty-six percent of all visible rust, mill scale, paint and other foreign matter from each square inch of surface by compressed air nozzle blasting, centrifugal wheels or other specified methods.

7. SSPC-SP7 BRUSH-OFF BLAST CLEANING: The removal of loose rust, mill scale, paint and foreign matter from the surface by compressed air nozzle blasting, centrifugal wheels or other specified methods.

8. SSPC-SP8 PICKLING: The complete removal of all rust, mill scale and foreign matter by chemical reaction or electrolysis in acid solutions. The degree of cleanliness is similar to SSPC-SP5 White Metal Blast Cleaning.

9. SSPC-SP9 WEATHERING AND CLEANING: This is a method of preparing unpainted metal surfaces for coating by weathering metals to remove all or part of mill scale followed by blast cleaning.

10. SSPC-SP10 NEAR-WHITE METAL BLAST CLEANING: The removal of ninety-five percent of all visible rust, mill scale, paint and other foreign materials from each square inch of surface by compressed air nozzle blasting, centrifugal wheels or other specified reason.

11. On galvanized surfaces, prepare in accordance with the methods outlined in ASTM D 6386-99 Standard Practice for Preparation of Zinc (Hot Dipped Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

12. On stainless steel surfaces, prepare by solvent cleaning prior to using any one of the methods in SSPC-SP1. Only solvents or cleaning solutions containing less than two hundred (200) ppm of halogens shall be used to prevent stress corrosion cracking. Abrasive blast cleaning procedures outlined by Steel Structures Painting Council for carbon steel may also be used for stainless steel. Only very hard silica sand or other abrasive material should be used for a fast cutting action and to obtain a sharp angular profile.

D. Shop Primed Steel Surfaces

1. The paint systems shown in appendix B are to be used for equipment and piping delivered to the site even though they may already be shop primed. A shop prime coat shall not be substituted for the surface preparation of prime coats required on-site by the paint systems listed in that Section.

2. Sand or scrape to remove loose primer and rust.

3. Feather edges to form a smooth transition to tight existing paint.

4. Shop Prime Coat: Apply per Finish Schedule in Appendix B at the end of this Section in accordance to the requirements for prime coating.

E. Concrete and Masonry Surfaces

1. All concrete and masonry surfaces to be painted or sealed shall be clean, dry and free of dirt, oils, dust, grease, wax, flaking or loose paint, efflorescence and other deleterious materials. All cracks, chips and other defects in plain concrete and masonry surfaces shall be filled prior to coating or sealing.

2. New concrete or masonry should not be coated for at least twenty-eight (28) days to permit the concrete or mortar to cure and dry out.

3. Prepare concrete or masonry surfaces to be coated in accordance with SSPC SP-13. Surface profile shall be accordance with ICRI CSP standards as recommended by the manufacture based on coating system and the intended environment. The surface of concrete or masonry to be coated should be examined for defects such as fins, protrusions, bulges and mortar spatter. These defects should be corrected by grinding or scraping. Remove non-degraded release agents, oil, wax, and grease by scraping off heavy deposits and solvent cleaning with a hot trisodium phosphate solution. Allow time to dry thoroughly before coating.

F. Cast and Ductile Iron Piping

1. Preparation per NAPP 500 requirements, latest edition.

G. Wood surfaces

1. Wood shall be clean and dry. Remove surface deposits of sap or pitch by scraping and wiping clean with mineral spirits or VM&P naphtha. Seal knots and pitch pockets with shellac reduced with equal parts of shellac thinner (denatured alcohol) before priming. Sand rough areas with the grain, starting with medium grit sandpaper and finishing with fine grit. Remove sanding dust. After prime coat is dry, fill cracks and holes with putty or spackling compound. When filler is hard, sand flush with the surface using fine grit sandpaper. Sand lightly between coats with fine grit, open-coated sandpaper.

H. PVC Pipe

1. All surfaces to be uniformly and thoroughly scarified using a medium grit sandpaper. Any dust or other contaminants remaining after sanding shall be removed with dry, oil free compressed air or by vacuum after cleaning.

I. Gypsum Drywall Construction

1. Sand joint compound with fine-grit, open-coated sandpaper to provide a smooth flat surface. Avoid heavy sanding of the adjacent wallboard surfaces, which will raise the nap of the paper covering. Remove dust from the surface by wiping with clean rags or other means. If additional joint finishing is required to provide a smooth surface, the same joint compound or ready-mixed spackling compound shall be used. Putty, patching pencils, caulking, or masking tape shall not be applied to the drywall surfaces to be painted. Lightly scuff-sand tape joints after priming to remove raised paper nap. Take care not to sand through the prime coat and remove dust by wiping with clean rags.

3.3 PROTECTION

- A. Protect elements surrounding work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.4 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. All painting shall be done in the best manner by skilled workmen and in accordance with the SSPC Good Painting Practices PA1 and the manufacturer's application recommendations. The Contractor shall follow OSH requirements. Extreme care shall be taken around volatile materials, which could pose a fire or explosion hazard. Precautions shall be taken to avoid workmen from inhaling toxic or dangerous vapors or paint particles. Containers for use shall be opened in the presence of the Engineer immediately before use.
- C. Paint shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Where necessary, packaged paint other than cement-emulsion filler may be thinned immediately prior to application in accordance with the manufacturer's directions if authorized by the Engineer, but not in excess of one pint of thinner per gallon of paint.
- D. Surfaces that have been cleaned or pretreated shall be given a first coat of paint as soon as practical after surface preparation, prior to any deterioration of the prepared surfaces.

E. Each coat shall be applied at the rate and to the film thickness specified in Appendix B. One (1) gallon of paint as originally furnished must not cover a greater area than when applied by spray gun than when applied by brush unthinned.

F. All paint shall be thoroughly and smoothly applied or brushed out to a uniform film without runs or sags. Each coat of finish shall be allowed to completely cure and dry hard before application of the succeeding coat. First coats for specific metal surfaces shall be applied by brush, if required by the Engineer. When the trim has been shop primed, any subsequent coats may be applied by brush, roller, or spray. Other surfaces may be coated by brush, roller, or spray, except for filler coats. Sand lightly between coats if required to achieved specific finish.

G. Apply each coat of paint in contrasting color than the preceding coat unless otherwise approved by the Engineer.

H. Metal surfaces adjacent to other surfaces receiving water-based paints shall be primed and/or touched-up prior to the application of the water-based paints. The first coat on plaster shall include touching-up or application of primer-sealer as necessary to produce a uniform color and gloss. Application of styrene-butadiene filler shall be in accordance with the manufacturer's instructions. Surface voids, pores, and cracks shall be filled, and the completed dry film shall be free from pinholes or other imperfections. Surface irregularities need not be completely filled. The coating material shall not be applied over caulking compound.

I. Paint on metal, masonry, plaster, or concrete areas of considerable size (except floors) may be sprayed by skilled workmen only. Respirators shall be worn by those in proximity of spray painting. The nozzle shall be held perpendicular to the surface being painted and the coat applied uniformly, thoroughly wetted, and properly bonded to the surface. Immediately after spraying, remove all surplus paint and smooth out all runs and sags by brushing out. Adjacent surfaces shall be protected from drips, spatter, and over spray.

3.5 PAINTING EQUIPMENT

A. Brushes shall be new and be the size and type best suited for the particular work. Brushes shall be kept clean and stored properly when not in use. If rollers are used for applying enamel, they shall have a short nap, as required by the manufacturer.

B. Spraying equipment shall be subject to the Engineer's authorization. Compressors shall be motor-driven, oil and water free, and shall be set in locations designated by the Engineer and connected and used without interfering with the work of other trades. The paint spray container shall have an efficient agitator for materials requiring this. All flexible hose, nozzles, and equipment shall be thoroughly cleaned after each day's work and maintained in first-class working conditions.

3.6 FINISHING MECHANICAL EQUIPMENT AND PIPING

A. Finish paint shop primed equipment to color selected.

B. Prime and paint insulated and exposed pipes, hangers, brackets, collars, and supports except where items are prefinished.

C. Replace identification markings on mechanical equipment when painted accidentally.

D. Pipe Color Code

1. All new, exposed, interior, and submerged piping shall be painted. Plastic pipe shall be painted only in order to indicate its use according to the Pipe Color Code, and only that portion which is exposed and not submerged shall be painted. Plastic pipe which is used for purposes other than those mentioned in the Pipe Color Code shall not be painted. In general, the only application for asphalt dipped pipe shall be buried installations. Pipe colors shall be according to the following schedule. The direction of flow of the contents of the pipe shall be stenciled on the piping. Permanently attached plastic markers may be used in lieu of the stenciling. Shop drawings shall indicate stencil or plastic marker method.

2. Water: Color banding and identification of piping (flow arrows, naming, numbering) in accordance with following schedule and the Recommended Standards for Water Works, published by the Great Lakes – Upper Mississippi River Board State Public Health and Environment Managers, latest edition.

a.	Raw water line	Olive
b.	Settled or Clarified water	Aqua
c.	Potable Water	Blue
d.	Alum or Primary Coagulant	Orange
e.	Ammonia	White
f.	Carbon Slurry	Black
g.	Caustic	Yellow w/ green band
h.	Chlorine	Yellow
i.	Fluoride	Light blue w/ red band
j.	Lime Slurry	Light Green
k.	Ozone	Yellow w/ orange band
l.	Phosphates	Light green w / red band
m.	Potassium Permanganate	Violet
n.	Soda Ash	Light green w/ orange band
o.	Sulfuric Acid	Yellow w/ red band
p.	Sulfur Dioxide	Light green w/ yellow band
q.	Backwash Waste	Light brown
r.	Sludge	Dark brown
s.	Sewage (wastewater) line	Gray
t.	Compressed Air line	Green
u.	Gas	Red
v.	Polymers or Coagulant Aids	Orange w/ green band

The contents and direction of flow shall be stenciled on the piping in a contrasting color.

3. Wastewater: Color banding and identification of piping (flow arrows, naming, numbering) in accordance with following schedule and the Recommended Standards for Wastewater Facilities, published by the Great Lakes – Upper Mississippi River Board State Public Health and Environment Managers, latest edition.

a.	Raw Sludge line	Brown w/black bands
b.	Sludge Recirc. Suction line	Brown w/yellow bands

c.	Sludge Draw off line	Brown w/orange bands
d.	Sludge Recirc. Discharge line	Brown
e.	Non-potable water line	Blue w/black bands
f.	Potable Water line	Blue
g.	Sewage (wastewater) line	Gray
h.	Chlorine Line	Yellow
i.	Sulfur Dioxide	Yellow w/red bands
j.	Compressed Air line	Green
k.	Water lines for heating digesters	Blue w/6" band @ 30" spacing
l.	Plumbing drains and vents	Black

The contents and direction of flow shall be stenciled on the piping in a contrasting color.

4. Pipe Lettering Size

<u>Pipe O.D. (inches)</u>	<u>Letter Height (inches)</u>
3/4 to 1-3/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4
8 to 10	2-1/2
Over 10	3-1/2

3.7 CLEANING

- A. As work proceeds, promptly remove paint where spilled, splashed or spattered.
- B. During progress of work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Collect cotton waste, cloths, and materials that constitute a fire hazard; place in closed metal containers and remove daily from site.
- D. Upon completion of work, leave premises neat and clean, to the satisfaction of Engineer.

APPENDIX A - ITEMIZED PAINTED SCHEDULE

<u>A. New Items to be Painted</u>	<u>Color</u>
N/A	

<u>B. Existing Items to Be Painted</u>	<u>Color</u>
N/A	

END OF APPENDIX A

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion	SSPC-SP6	TP2 or IPP1	TI2 or IPI1	TF1 or IPF1
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersed	SSPC-SP6	TP2 or IPP1	TI2 or IPI1	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersed (2 nd Option)	SSPC-SP6	IPP2	N/A	IPF2
Steel-Structural Tanks, Pipes, Equipment Immersion, Potable Water	SSPC-SP10	TP2 or IPP3	TI5 or N/A (IP)	TF8 or IPF3
Steel-Structural Tanks, Pipes, Equipment Immersion, Non-Potable Water	SSPC-SP10	TP2 or IPP2	TI2 or N/A (IP)	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Below Grade	SSPC-SP10	TP2 or IPP4	N/A	TF5 or IPF4
Factory Primed Steel Exterior Exposed	N/A	N/A	TI4 or IPI3	TF1 or IPF1
Factory Primed Steel Interior Exposed	N/A	N/A	TI4 or IPI3	TF2 or IPF2
PVC Pipe Exterior Exposed	Scarify	TP1 or IPP1	N/A	TF1 or IPF1
PVC Pipe Interior Exposed	Scarify	TP1 or IPP1	N/A	TF1 or IPF2

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter- mediate</u>	<u>Finish</u>
Ductile Iron Pipe Exterior Exposed Non-Immersed	NAPF 500-03-03	TP2 or IPP1	TI2 or IPI3	TF1 or IPF1
Ductile Iron Pipe Interior Exposed Non-Immersed	NAPF 500-03-03	TP2 or IPP1	TI2 or N/A (IP)	TF4 or IPF2
Ductile Iron pipe Immersion Non-Potable Water	NAPF 500-03-03	TP2 or IPP1	TI2 or IPI1	TF4 or IPF2
Ductile Iron Pipe Immersion Potable Water	NAPF 500-03-03	TP2 or IPP5	TI5 or N/A (IP)	TF8 or IPF3
Ductile Iron Pipe Below Grade	NAPF 500-03-03	TP2 or IPP4	N/A	TF5 or IPF4
Galvanized Steel and Non-Ferrous Metals Exterior Exposed	ASTM D 6386- 99	TP1 or IPP1	N/A	TF1 or IPF1
Galvanized Steel and Non-Ferrous Metals Interior Exposed	ASTM D 6386- 99	TP1 or IPP1	N/A	TF2 or IPF2
Galvanized Steel and Non-Ferrous Metals Immersion, Potable Water	ASTM D 6386- 99	TP2 or IPP5	N/A	TF10 or IPF3
Galvanized Steel and Non-Ferrous Metals Immersion, Non-Potable Water	ASTM D 6386- 99	TP1 or IPP1	N/A	TF4 or IPF2
Galvanized Steel and Non-Ferrous Metals Chain Link Fence	ASTM D 6386- 99	TP1 or IPP1	N/A	TF1 or IPF1
Concrete Exterior Exposed	SSPC-SP 13	TP4 or IPP6	TI3 or IPI1	TF7 or IPF5

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Concrete Exterior Exposed Below Grade	SSPC-SP 13	N/A	N/A	TF5 or IPF6
Concrete Immersion Non-Potable Water	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP7	N/A or IPI1	TF4 or IPF2
Concrete Immersion Potable Water	SSPC-SP 13 ICRI-CSP5	TP3 or IPP6	N/A or IPI2	TF10 or IPF3
Concrete Immersion Brine Tank	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP8	TI5 or N/A (IP)	TF12 or IPF7
Concrete Interior Exposed	SSPC-SP 13 ICRI-CSP 1-3	TP3 or IPP2 Patch as required	N/A	TF4 or IPF2
Concrete Secondary Containment Severe Conditions Interior Exposed	SSPC-SP 13 ICRI - CSP 5	TP3 or IPP6	TI6 or IPI4	TF9 or IPF8
Concrete Floors Non-Slip Clear Finish	SSPC-SP 13 ICRI-CSP 3	TP6	N/A	TF10
Concrete Masonry Exterior Exposed	Clean and Dry	TP4 or IPP9	TI3 or IPI1	TF7 or IPF1
Concrete Masonry Interior Exposed	Clean and Dry	TP5 or IPP9	TI2 or IPI1	TF4 or IPF2
Plaster and Wallboard Interior Exposed	Clean and Dry	TP4 or IPP10	N/A	TF3 or IPF9
Wood Interior and Exterior	Clean and Dry	TP4 or IPP11	N/A	TF3 or IPF10

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Insulated Pipe Interior	Clean and Dry	TP4 or IPP6	T17 or IP15	TF6 or IPF11
Concrete: Severe Wastewater (H ₂ S) Environments	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP8	T18 or N/A (IP)	TF11 or IPF7
Steel: Severe Wastewater (H ₂ S) Environments	SSPC-SP 5, 3.0 mil minimum profiled	N/A	TF11 or N/A (IP)	TF11 or IPF7
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion – ELEVATED WATER STORAGE TANKS – NEW CONSTRUCTION	SSPC-SP10	IPP12	IP16	IPF1
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion - ELEVATED WATER STORAGE TANKS – MAINTENANCE & REPAIR (Option 1 – polyurethane)	SSPC-SP7 Min: SSPC- SP2/SP3	IPP13 Spot Prime	IP16	IPF1
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion - ELEVATED WATER STORAGE TANKS – MAINTENANCE & REPAIR (Option 2 – acrylic)	Power Wash w/Devprep 88 (min 2000 psi)	IPP13 Spot Prime	IP15	IPF11

E. Tnemec Prime (TP) Coat:

TP1	Series N69Hi-Build Epoxoline II, 2.0-3.0 mils dry
TP2	Series 1 Omnithane 2.5 – 3.5 mils
TP3	Series 218 MortarClad, min. 1/32"
TP4	Series 151 Elasto-Grip FC, 0.7 – 1.5 mils dry

	TP5	Series 130 EnviroCrete, 60 - 80 sq. ft./gal spread rate for porous CMU, 85 to 115 sq. ft./gal. for dense CMU
	TP6	Series 201 Epoxoprime
F.	Tnemec Intermediate (TI) Coats:	
	TI1	Series N69 Hi-Build Epoxoline II, 2.0-3.0 mils dry
	TI2	Series N69 Hi-Build Epoxoline II, 4.0-6.0 mils dry
	TI3	Series 156 EnviroCrete, 4.0-8.0 mils dry
	TI4	Series 27 Typoxy, 2.0-3.0 mils dry
	TI5	Series 140 Pota-Pox, 4.0-6.0 mils dry
	TI6	Series 237SC PowerTread 8.0-10.0 mils dry
	TI7	Series 6 Tneme-Cryl, 2.0 – 3.0mils dry
	TI8	Series 434 Perma-Shield H2S, 1/8” min. thickness
G.	Tnemec Finish (TF) Coats:	
	TF1	Series 73 Endura-Shield, 2.0-3.0 mils dry
	TF2	Series N69 Hi-Build Epoxoline, 2.0-3.0 mils dry
	TF3	Series 113 HB Tneme-Tufcoat, 4.0 – 6.0
	TF4	Series N69Hi-Build Epoxoline II, 4.0-6.0 mils dry
	TF5	Series 46H-413 Hi-Build Tneme Tar, 14.0-20.0 mils dry
	TF6	Series 6 Tneme-Cryl, 2.0-3.0 mils dry
	TF7	Series 156 EnviroCrete, 4.0-8.0 mils dry
	TF8	Series N140 Pota-Pox Plus, 4.0 to 6.0 mils dry
	TF9	Series 282 Tneme-Glaze, 6.0 – 8.0
	TF10	Series 294 Clear CRU 2.0–3.0 mils dry
	TF11	Series 435 Perma-Glaze 15.0 – 2.0 mils
H.	International Paint (IPP) Prime Coats:	
	IPP1	Devoe Devran 201H, 2.0-3.0 mils dry
	IPP2	Devoe Devran 224HS, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry
	IPP3	Devoe Bar Rust 233H, 4.0-6.0 mils dry or International Interseal 670HS, 4.0-6.0 mils dry
	IPP4	Devoe DevTar 5A-HS, 6.0-8.0 mils dry

IPP5	Devoe Bar Rust 233H, 2.0-3.0 mils dry (thinned) or International Interseal 670HS, 2.0-3.0 mils dry (thinned)
IPP6	Pre-Prime 167, 1.0-1.5 mils dry
IPP7	Devoe Devfil 145
IPP8	Enviroline 50 Moisture Tolerant Primer, 2.0-4.0 mils dry or Ceilcote 680M Primer, 2.0-4.0 mils dry
IPP9	Devoe Bloxfil 4000
IPP10	Devoe Tru-Glaze 4030, 2.0-3.0 mils dry
IPP11	Devoe Devflex 4020
IPP12	Devoe Cathacoat 302H, 2.5-4.0 mils dry or International Interzinc 22, 2.5-4.0 mils dry
IPP13	Devoe Bar Rust 231, Spot Prime or International Intergard 345, Spot Prime

I. International Paint Intermediate (IPI) Coats:

IPI1	Devoe Devran 224HS, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry
IPI2	Devoe Bar Rust 233H, 4.0-6.0 mils dry or International Interseal 670HS, 4.0-6.0 mils dry
IPI3	Devoe Devran 201H, 2.0-3.0 mils dry
IPI4	Devoe Devchem 253, 5.0-6.0 mils dry
IPI5	Devoe Devflex 659, 2.0-3.0 mils dry
IPI6	Devoe Bar Rust 231, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry

J. International Paint Finish (IPF) Coats:

IPF1	Devoe Devthane 379, 2.0-3.0 mils dry or International Interthane 990, 2.0-3.0 mils dry
IPF2	Devran 224HS, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry
IPF3	Devoe Bar Rust 233H, 4.0-6.0 mils dry or International Interseal 670HS, 4.0-6.0 mils dry

IPF4	Devoe DevTar 5A-HS, 6.0-8.0 mils dry
IPF5	Devoe Devthane 378, 2.0-3.0 mils dry or International Interthane 870, 2.0-3.0 mils dry
IPF6	Interzone 954 or Devtar 247, 16.0-20.0 mils dry
IPF7	Enviroline 222, 20.0-100.0 mils dry or Ceilcote 663SG, 60.0-120.0 mils dry
IPF8	Devoe Devchem 258, 5.0-6.0 mils dry
IPF9	Devoe Tru-Glaze 4418, 2.0-3.0 mils dry
IPF10	Devoe Devflex 4216, 2.0-3.0 mils dry
IPF11	Devoe Devflex 659, 2.0-3.0 mils dry

END OF APPENDIX B

END OF SECTION

CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR
CITY OF FLINT WATER TREATMENT PLANT
PHASE II, SEGMENT 3 – FILTER MEDIA REPLACEMENT
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City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 02540
CHEMICAL PIPING

PART 1 - GENERAL

1.01 Summary

This section governs the material, pipe, fittings, connections, butt fusion and general construction practices for all chemical piping.

1.02 References

- A. AWWA C110-08 Ductile Iron and Gray Iron Fittings
- B. AWWA C906-07 – Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In., for Water Distribution and Transmission.
- C. AWWA C207-07 – Steel Pipe Flanges for Waterworks Service – Sizes 4 In. Through 144 In.
- D. ASTM D-1784 – Rigid Poly (Vinyl Chloride)(PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- E. ASTM D-2837 – Standard Test method for Obtaining Hydrostatic Design basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
- F. ASTM D-2846 - Chlorinated Poly (Vinyl Chloride) (PVC) Plastic Hot and Cold Water Distribution Systems
- G. ASTM D-3261-03 – Butt Heat Fusion for Polyethylene Plastic Pipe and Fittings
- H. ASTM D-3350 – Polyethylene Plastics Pipe and Fittings Materials
- I. ASTM F-439 – Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- J. ASTM F-441 – Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
- K. ASTM F-2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

1.03 Related Work

- A. Section 02550 – Chemical Piping Valves
- B. Section 02560 – Pipe Testing

1.04 Pipe Packaging, Handling and Storage

- A. The manufacturer shall package the pipe in a manner designed to deliver the pipe to the project neatly, intact and without physical damage. The transportation carrier shall use appropriate method and intermittent checks to ensure the pipe is properly supported, stacked and restrained during transport such that the pipe is not nicked, gouged or physically damaged.
- B. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The handling of the pipe shall be done in such a

manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.

- C. Sections of pipe having been discovered with cuts or gouges in excess of 5 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt-fusion joining method.
- D. Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers must be avoided. Nylon slings are preferred. Spreader bars are recommended when lifting long fused sections. Care must be exercised to avoid cutting or gouging the pipe.

PART 2 - PRODUCTS

2.01 Manufacturers – the list of manufacturers below does not imply pre-approval of any product. All products must meet the requirements of this specification and be approved by the Engineer.

A. HDPE and CPVC Pipe

- 1. IPEX Inc,
- 2. Harvel Plastics Inc.
- 3. Charlotte Pipe and Foundry / Cresline Plastic Pipe Company
- 4. Spears Manufacturing
- 5. Harrison Plastics Corp.
- 6. Asahi / America

B. HDPE Dual Containment Pipe

- 1. Asahi / America

2.02 Materials

A. Pipe and Fittings

- 1. Chemical resistance data shall be provided for all plastic piping.
- 2. High Density Polyethylene (HDPE) – Single wall
 - a. All polyethylene pipe and fittings shall be in accordance with AWWA C906-07 from material having Standard PE code designation of PE 4710 and intended for use in the transportation of chlorinated water with a chlorine concentration of up to 2,000 ppm.
 - b. All HDPE pipe shall be black with UV stabilizer. Submit product data.
 - c. At the time of product submittal for approval, the supplier shall have enclosed an Affidavit of Compliance certifying that the pipe products furnished by him meet with all above standard requirements. Furthermore, polyethylene compounds shall be tested and certified as suitable for use with chlorinated water, in concentrations as listed, by an independent accredited testing agency.
 - d. The pipe and fitting manufacturer shall also supply certification that samples of this product have undergone stress regression testing, evaluation, and validation in accordance with ASTM D-2837 and PPI TR-3.

- e. Pipe and fittings shall be produced by the same manufacturer from identical materials meeting the requirements of this specification.
- f. Single wall HDPE Pipe and fittings shall be of 160 psi minimum pressure class, size and SDR as shown on the plans. If SDR is not shown stated on the plans, the minimum pipe thickness shall be SDR 11.
- g. Flanged connections, where shown, shall be supplied with 316 stainless steel lap joint flanges meeting AWWA C207D specifications, and joined with 5/8" diameter 316 stainless steel bolts, washers and nylon inserted locking nuts of the specified size. The stainless steel bolts shall have adequate thread length to assure proper joint seal.
- h. Dual Containment HDPE Piping and Fittings
 - i) Asahi Chem Prolok
 - a) PE 100-PC resin
 - b) HDPE material as per ASTM 3350
 - ii) Size and wall thickness ratings as shown on the plans. If thickness is not shown on the plans, pipe shall have the following minimum wall thicknesses: containment pipe - SDR 13.5, and carrier pipe - SDR 11.
 - iii) All pipe and fittings rated for minimum pressure of 150 psi at 68 degrees F.
 - iv) Manufacturer's data shall be submitted for dual containment pipe that adequately demonstrates that the pipe is suited for horizontal directional drill installation.
 - v) Pipe Centralizers
 - a) Full round centralizers thermally bonded to carrier pipe.
 - b) Spacing shall be per Plastic Piping Institute standards.
 - c) Molded or machined from HDPE pipe grade resins or sheet.
 - d) At least 2 openings per centralizer to permit fluid flow.
 - e) Centralizers shall uniformly maintain position of carrier pipe within the containment pipe.
 - f) OD of the centralizer shall meet the ID of the containment pipe.
 - g) End termination fittings shall be used where shown on the plans to provide transition to single wall pipe.

3. CPVC

- a. All CPVC pipe shall be manufactured from a Type IV, Grade I Chlorinated Polyvinyl Chloride (CPVC) compound with a minimum Cell Classification of 23447 per ASTM D1784.
- b. CPVC pipe shall conform to the requirements of ASTM F-441 chlorinated polyvinyl chloride plastic pipe, Schedule as shown on the plans. The pipe shall be manufactured in strict compliance to ASTM F441, consistently meeting the Quality Assurance test requirements of this standard with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be produced in the USA using domestic materials, by an ISO 9001 certified manufacturer, and shall be stored indoors after production, at the manufacturing site, until shipped from factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for

potable water applications. The pipe shall have a Flame Spread rating < 25 and a Smoke Development rating < 50 when tested and listed for Surface Burning Characteristics in accordance with CAN/ULC-S102-2-M88 or equivalent.

- c. Fittings shall conform to the requirements as outlined in ASTM F-439 for Schedule 80 socket type fittings.

4. Gaskets

- a. All flanged joints, except as otherwise specified, shall be made with rubber gaskets, full face. They shall conform to Appendix A of AWWA C110-08.

PART 3 - EXECUTION

3.01 Installation

- A. Installation practices, including support spacing, butt fusion and solvent welding, shall be in compliance with the manufacturer's printed recommendations.
- B. HDPE piping manufacturer shall provide written butt fusion procedure and requirements.
- C. Butt fusion heating requirements for dual containment piping shall be based on the thicker of the two pipes.
- D. The contractor shall install a sufficient number of unions for ease of disassembly as recommended by the manufacturer's printed recommendations.
- E. Curving HDPE pipe shall not exceed minimum manufacturer's recommendations. In general, bending radius shall not be less than 40 times the pipe OD.
- F. Dual wall piping manufacturer's representative shall provide up to 1 day on-site training for water treatment plant staff.

3.02 Testing

- A. CPVC and/or single wall HDPE pipe shall be tested as per the requirements of Section 02560 Pipe Testing.
- B. HDPE Dual Containment Pipe - Test as per ASTM F 2164 and Section 02560 Pipe Testing.

3.03 Joining

- A. All CPVC socket type connections shall be jointed with CPVC solvent, having a minimum viscosity of 2000 cps; as Type 80-c cement. Submit manufacturer's data for approval.
- B. Except where flange connections are specifically shown, HDPE pipe and fittings shall be butt fusion joined in accordance with the manufacturer's recommended procedure. Threaded or socket type connections will not be accepted. The pipe and fitting manufacturer shall provide fusion training services for field construction and inspection personnel.
- C. Only an agent of the manufacturer of dual containment pipe or operator properly trained for dual containment pipe thermal welding shall perform the welding.

*** END OF SECTION ***

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 02550
CHEMICAL PIPING VALVES

PART 1 - GENERAL

1.01 Work Included

- A. Chemical piping valves and accessories for buried, exposed, submerged and other types of piping, except where included in other Sections.
- B. Coordination: Review installation procedures under other Sections and coordinate with the Work which is related to this Section, including buried piping installation, exposed piping installation, plumbing, etc.

1.02 Related Work

- A. Section 02540 – Chemical Piping

1.03 References (latest editions)

- A. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
- B. ASTM A48 - Gray Iron Castings.
- C. ASTM A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- D. ASTM D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- E. ASTM D2467 - Socket-type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- F. ASTM F437 - Threaded Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.
- G. ASTM F439 - Socket-type Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.

1.04 Quality Assurance/Quality Control – Manufacturer's Qualifications

- A. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least five (5) years.
- B. Insofar as possible, all valves of the same specific type shall be the product of one (1) manufacturer.

1.05 Submittals

Submit shop drawings and product data as per the requirements below:

- A. Valve Manufacturer Submittals: Submit for review detailed drawings, data and descriptive literature on all valves and appurtenances, including:

1. Dimensions.
 2. Size.
 3. Materials of construction.
 4. Weight.
 5. Protective coating.
- B. Manufacturer's Certifications: Submit manufacturer's certificates of compliance with ANSI, AWWA and other Standards listed herein.
- C. Manufacturer's Service Report:
1. Certify that valves are properly installed except as noted.
 2. Recommend corrective action for any deficiencies noted.
- D. Submit a detailed operation and maintenance manual for all valves and appurtenances provided under this Section, including the following information:
1. Product name and number.
 2. Name, address and telephone number of manufacturer and local distributor.
 3. Instruction bulletins for operation, maintenance and recalibration.
 4. Complete parts and recommended spare parts lists.
- 1.06 Valve Delivery, Handling and Storage
- A. Deliver products to site under provisions of Section 01600.
 - B. Store and protect products under provisions of Section 01600.
 - C. Valves and appurtenances which are cracked, chipped distorted or otherwise damaged or dropped will not be acceptable.
 - D. Store all valves and appurtenances off the ground in enclosed shelter.

PART 2 - PRODUCTS

2.01 General

- A. Valves shall be installed as shown on the Contract Drawings and as otherwise necessary to provide a safe, convenient, flexible and economical control of all piping systems and their related equipment.
- B. Valves 4" and larger equipped with flanged joints shall be in conformity with the current ANSI B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", Class 250 drilling.
- C. Valves and unions or flanges shall be provided at each individual connection to each piece of equipment to permit complete servicing or removal of each item and drainage of pipe systems. Valves shall be provided for all branch lines; unless otherwise indicated or specified, all valves less than 4" shall be provided with threaded connections.

- D. Dual contained valves provided by the piping manufacturer shall be supplied pre-assembled and tested to 150% of the maximum operating pressure. Actuators, stem extensions and accessories shall be part of the preassembled package.

2.02 Ball Valves, 4" and smaller

A. Manufacturers:

- 1. Asahi or approved alternative

B. Materials:

- 1. CPVC Type IV, Cell Classification 23447HDPE
- 2. O-Rings: EPDM or FKM
- 3. All valves shall have polypropylene handle.

C. Rated Working Pressure:

- 1. 150 psi at 68° F.

PART 3 - EXECUTION

3.01 Installation

- A. Install valves and specialties in accordance with manufacturer's recommendations and instructions to permit intended performance.
- B. Extreme care shall be used in the handling, storage and installation of equipment to prevent damage or distortion of the equipment and to ensure proper performance.

3.02 Testing

- A. All valves shall be given hydrostatic shop pressure test in accordance with applicable AWWA standard specified. The valves shall be tested, first by applying the hydrostatic pressure with the valve open, and then with the valve closed. The valves shall be tight and secure under the test pressure.
- B. Valves and specialties shall be tested in place by the Contractor, and any defects in valves, specialties or connections shall be correct to the satisfaction of the Engineer.

3.03 Identification of Valves

- A. Each shutoff or control valve installed inside the plant, valve vault, out building or other accessible area (except those provided as a component of a specific equipment item) shall be provided with a 1-1/2" minimum diameter heavy brass tag.
- B. Each tag shall have a unique identifying alpha-numeric code identifying the valve type and service, as approved by the Engineer.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

**SECTION 02560
PIPE TESTING**

PART 1 - GENERAL

1.01 Section Includes

- A. Testing of all piping, as specified.
- B. Pipelines to be Tested:
 - 1. Chemical Feed piping
 - 2. All other new piping not specifically listed above.

1.02 Related Sections

- A. Section 02540 – Chemical Piping
- B. Section 02550 – Chemical Piping Valves

1.03 Quality Assurance

All equipment, devices, and tools required for testing of piping systems shall be provided by Contractor and shall be of first class construction designed to perform the required service.

1.04 Submittals

Contractor shall submit for review his test procedures for each pipeline to be tested. Provide list of equipment and materials to be used during each test, including size, capacity, manufacturer, model numbers, and all necessary appurtenances.

PART 2 - PRODUCTS

2.01 Testing Equipment

- A. All testing equipment, including meter or measuring facilities shall be furnished by Contractor, and shall be subject to the Owner's approval.
- B. Contractor shall pay for all water necessary to complete testing.

PART 3 - EXECUTION

3.01 General

- A. Test all piping as specified herein except as otherwise authorized by the Engineer.
- B. Notify the Engineer 48 hours in advance of testing.
- C. Provide all testing apparatus, including pumps, hoses, gages and fittings.

- D. Pipelines shall hold the specified test pressure for a period of one (1) hour unless noted otherwise.
- E. Repair and retest pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate.
- F. Conduct all tests in the presence of the Engineer unless otherwise approved.
- G. Contractor shall perform all specified testing.

3.02 Pressure and Leakage Tests Procedures

A. Exposed Piping, Interior Piping, and HDPE Pipe

1. Ensure that all supports, restraints, and pipe protection features are securely in place.
2. Section to be tested shall be slowly filled with water to allow for escape of entrapped air. Install corporation stops as necessary for removal of air.
3. Test only 1 pipeline section at a time.
4. Apply test pressure of 150 psi for two (2) hours and observe pressure gage. Carefully check for leaks while test pressure is being maintained.
 - a. Examine exposed pipe, joints, fittings and valves. Stop visible leakage or replace the defective pipe, fitting or valve.
 - b. Pump water into the line with the test pump to maintain the specified test pressure for a one-hour period.
 - c. All repair, replacement, and retesting required because of failure to meet test requirements shall be made by Contractor.
5. Allowable Leakage Rates: No leakage permitted.
6. Leakage Test shall be repeated following corrective work until a satisfactory test is achieved.

B. HDPE Dual Containment Pipe

1. Carrier Pipe: Hydrostatic test as per Part 3.02 (C) above.
2. Containment Pipe
 - a. Air test at 10 psi over 10 minutes with no allowable pressure drop.
 - b. Perform air test with carrier pipe full of water and pressurized to at least 20 psi to avoid collapse.

3.03 Cleaning

All piping shall be thoroughly cleaned and flushed in a manner approved by Engineer prior to being placed into service.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 05550
BOLTS, ANCHOR BOLTS AND EXPANSION ANCHORS

PART 1 - GENERAL

1.1 SUBMITTALS

Submit the following information for review. Do not begin fabrication until after submittals have been reviewed.

A. Manufacturer's Product Data. Manufacturer's product data shall contain sufficient information to evaluate conformance to specifications and produce suitability for intended use. Submit test reports from accredited independent testing laboratories where specified. Submit manufacturer's product data for the following products:

1. Expansion Anchors. Certified pullout and shear capacities shall be included in the submittal.
2. Standard cast products.

1.2 SUBSTITUTIONS

Substitution of rolled sections, details or products is not permitted without prior written approval. If items shown or specified are not readily obtainable, permission to substitute for the specified item may be requested by the Contractor. Substitutions may be allowed on items of equal or superior properties which conform to design criteria.

1.3 CODE REQUIREMENTS

Design of steel fabrications shall conform to the requirements of AISC Specifications for Structural Steel for Building, Allowable Stress Design (Current Edition).

1.4 INSPECTION AND TESTING

The materials and workmanship covered in this specification may be inspected by the Owner, the Engineer or the Owner's designated testing laboratory. The testing laboratory will be employed and paid by the Owner as specified in Section 01380, Quality Control. Inspection may be performed in the mill, shop or field as deemed necessary. Inspection in no way relieves the Contractor from his responsibility to furnish satisfactory materials. The right to reject material at any time before final acceptance is reserved, if material and workmanship do not conform to drawings and specifications.

1.5 DELIVERY AND STORAGE

Schedule material delivery so that items may be erected promptly after arrival. If materials must be stored at the project site, they shall be stored aboveground on platforms, skids or other supports. Material stored at the site shall be kept free of dirt, mud, grease or oil. Protect stored material from corrosion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bolts, Studs, Nuts and Washers.

1. General
 - a. Bolt heads shall be marked with manufacturer, ASTM material designation/grade, and country where manufactured. Markings shall be raised or depressed.

b. At joint harnesses and restrained harnesses connected to flanges, the tie bolts and studs, flange bolts and nuts shall be in conformity with the current ASTM A193, Grade B7 and ASTM A194.

c. For pipe joints, bolt strength shall be adequate to provide compression needed for water tightness of the gasket material used.

2. Buried Conditions

a. Corrosion Resistant Steel (CRS) CRS anchor bolts, flange bolts, and studs shall be "Cor-Ten" type steel and shall conform to ASTM A325 Type 3 weathering steel with minimum tensile strength of 105 ksi. Type 3 bolts shall be marked A325. Nuts shall be in conformance with ASTM A563 Grade C3.

b. At buried mechanical joints, bolts and nuts shall be in conformance with all of AWWA C111 dimensions and requirements. Bolts and nuts shall be tension tested for a minimum ultimate tensile stress of 65 ksi using testing procedures corresponding to ASTM A307 requirements, and shall be proof load tested based on 45 ksi stress to AWWA C111 standards.

3. Exposed or Submerged Conditions.

a. Stainless Steel. Type 316 conforming to ASTM A193 Grade B8M, Class 2 with ASTM A194 Grade 8M stainless steel nuts and washers.

4. Other as Specified

a. Carbon Steel. Conform to ASTM A325, with suitable nuts and washers, as noted on the drawings. Washers bearing on metal shall be cast steel. Where type is not noted on the drawings, provide ASTM A325. Use carbon steel bolts where indicated on the drawings.

b. Stainless Steel. Where specified or indicated on the drawings as "stainless steel," "SS" or "stn. steel," Bolts shall be Type 304 conforming to ASTM A193 Grade B8M, Class 2 or 2B with ASTM A194 Grade 8 stainless steel nuts and washers or meet 3 (a) above.

B. Anchor Bolts.

1. Carbon steel anchor bolts shall be galvanized threaded rods conforming to ASTM A307, except where shown or specified otherwise, with suitable heavy hex nuts and oversize washers. Anchor bolts and nuts shall be tapped or chased after galvanizing. Use carbon steel anchor bolts except where noted otherwise on the drawings.

2. Stainless steel anchor bolts shall be Type 304 conforming to ASTM A193 Grade B8. Use stainless steel anchor bolts where shown on the drawings as "stainless steel," "stn. steel" or "SS." Provide stainless steel anchor bolts with suitable stainless steel nuts and oversize washers.

3. Provide anchor bolts for all equipment and machinery when anchor bolts are not furnished by the manufacturer. Anchor bolt type, size, length, projection, etc., shall conform to the requirements of the equipment and machinery manufacturer.

4. Provide templates to accurately position the anchor bolts in the forms.

C. Concrete Expansion Anchors.

1. Provide drilled-in concrete expansion anchors, which are externally threaded edge type expansion bolt anchors complete with washers and nuts. The anchors shall conform to Federal Specification FF S 325, Group II, Type 4, Class 1 concrete expansion anchors.

2. Carbon Steel Expansion Anchors. Not allowed.

3. Stainless Steel Expansion Anchors. Provide stainless steel expansion anchors conforming to AISI Type 316.

4. The expansion anchors shall have minimum ultimate capacity when tested in accordance with ASTM E 488 in 4,000 psi concrete as follows:

Stainless Steel:

Bolt Size	1"	3/4"	5/8"	1/2"
Minimum Shear Strength*	28,000#	18,000#	12,500#	8,340#
Minimum Pullout Strength	27,000#	14,500#	11,000#	8,000#
Minimum Embedment	6"	4-3/4"	4"	3-1/2"

*Shear plane through the anchor bolt shank.

5. Expansion anchors shall be installed in accordance with the manufacturer's recommendations.
6. A list of standard materials used in the manufacture of the anchor components, including designated material specification (AISI, ASTM, etc.), as well as pullout and shear values attained from tests performed by a certified independent testing laboratory in accordance with ASTM E 488, shall be submitted to the Engineer for review. The submittal shall also include the manufacturer's installation instructions.

PART 3 - EXECUTION

3.1 CONDITION OF SURFACES

- A. Prior to installation, inspect surfaces to which miscellaneous metal items will be attached. If the condition of the surface is such that it will adversely affect installation, do not proceed with installation until corrective measures have been taken.
- B. Verify that aluminum surfaces that will be in contact with concrete or steel have been coated as specified

3.2 INSTALLATION

- A. Accurately set work to established lines and elevations and securely fasten in accordance with approved shop drawings and provisions of this section.
- B. The Contractor shall be fully responsible for furnishing and installing any temporary braces, ties or shoring necessary to hold secure and safe all items under the action of wind and erection loads imposed thereon until construction is completed.
- C. Prior to placement of concrete, set concrete inserts (e.g. anchor bolts) in proper location and provide necessary anchorages or restraints to prevent movement of inserts during concrete placement.
- D. For stainless steel bolting, apply anti-sieze compound liberally to bolt threads and face of nuts to prevent galling.
- E. Follow manufacturer's installation instructions for concrete expansion anchors.

3.3 ERECTION OF STEEL ITEMS

Erection of steel items must conform to AISC specification, Structural Steel for Buildings. Field-fabricated bolt holes, when required, shall be drilled; or as an alternate, they may be flame-cut undersize and reamed to correct size.

END OF SECTION

City of Flint Water Treatment Plant
Phase II, Segment 3 – Filter Media Replacement

SECTION 09928
PROTECTIVE COATING SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. All labor, materials, equipment, transportation, supervision, tools, and services necessary for the surface preparation and field painting of exposed steel surfaces; including structural steel, equipment, piping, conduits, and all appurtenances and miscellaneous items

B. All mechanical equipment shipped without a finish coat shall be field painted prior to installation.

1.2 RELATED WORK

A. Work under this Section is also subject to the requirements specified in Divisions 0 and 1 of these Contract Documents:

B. Section 01330: Submittal Procedures.

C. Section 05120: Structural Steel

D. Section 05500: Metal Fabrications

E. Section 05510: Miscellaneous Metals

F. Section 05550: Bolts, Anchor Bolts, Expansion Anchors, and Concrete Inserts

1.3 REFERENCES

A. American National Standards Institute / American Society for Testing and Materials, ANSI / ASTM

1. ANSI / ASTM D16: Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. Ferrous Metal Standard: SSPC – Society of Protective Coatings

C. Cast and Ductile Iron Standard: NAF 500.

D. Recommended Standards For Water Works by Great Lakes Upper Mississippi River Board of State Public Health And Environment Managers.

E. Recommended Standards For Wastewater Facilities by Great Lakes Upper Mississippi River Board of State Public Health And Environment Managers.

F. International Concrete Repair Institute (ICRI)

1.4 DEFINITIONS

A. Conform to ANSI / ASTM D16 for interpretation of terms used in this Section.

Quality Assurance

B. Product Manufacturer: Company specializing in manufacturing quality paint and finish products intended for use in water/wastewater treatment plants with three (3) years of experience.

- C. Applicator: Company specializing in water/wastewater treatment plant painting and finishing with three (3) years of experience.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame/fuel/smoke rating requirements for finishes.
- B. All coatings in the following categories shall meet the USEPA Federal Clean Air Act ruling, which becomes effective on September 11, 1999. All coatings specified in the technical specification sections shall be revised accordingly to meet these requirements. The main categories targeted for Volatile Organic Compound levels are as outlined below:

1.	Form Release Agents	(450 g/L)
2.	Primers / Undercoatings	(350 g/L)
3.	Bituminous Coatings / Mastics	(500 g/L)

1.6 SUBMITTALS

- A. Submit in accordance with Section 01330
- B. Product Data
1. Provide product data on finishing products.
 2. Submit manufacturer's application instructions.
 3. Submit samples in 1" x 2" size illustrating range of colors and textures available for each surface finishing product scheduled for selection.
- C. Shop drawings shall include a listing of all items which the Contractor intends to paint, the paint materials designated for use on those specific items, color charts, and blank spaces to allow the Owner to insert their color selections for each item.

The color selections may be adjusted by the Owner and Engineer after a specific manufacturer of paint has been chosen by the Contractor, and the shop drawings have been reviewed by the Engineer. The Owner reserves the right to specify colors other than those stated in this Section, or as shown on the Drawings. It shall be the Contractor's responsibility to have the final color selections authorized by the Owner prior to ordering any paint materials.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and protect products in accordance with Section 01600.
- B. Deliver products to site in sealed original labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and / or reducing.
- D. Store paint materials at a minimum ambient temperature of 45o F and a maximum of 90o F, in a well ventilated area, unless manufacturer's instructions have different requirements.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. All paint shall be applied in accordance with the applicable manufacturer's printed data sheet and container label outlining recommended minimum and maximum surface and air temperatures required for application. Paint

shall not be applied to wet or damp surfaces and shall not be applied in rain, snow, fog or mist, or when the relative humidity exceeds 85%.

B. No paint shall be applied when it is expected that the relative humidity will exceed 85% and/or the air temperature will drop below recommended levels within 12 hours after paint application. Dew or moisture condensation should be anticipated, and if such conditions are prevalent, painting shall be delayed until certain that the surfaces are dry. Painting should be completed well in advance of the probable time of day when condensation will occur in order to permit the film an appropriate drying time prior to the formation of moisture on the surface.

C. Provide minimum lighting level of 15 foot-candles on surfaces to be finished.

1.9 EXTRA STOCK

A. Provide 1-gallon container, or small kit, of each type of paint color to owner.

B. Label each container with color, and room location, in addition to the manufacturer's label.

C. Containers shall be tightly sealed.

1.10 ITEMS TO BE PAINTED

A. General List: These lists are intended to provide an overview of work and there may be minor or specific exceptions noted on the Drawings or Specified in Appendix A – Itemized Painting Schedule.

1. All unit process equipment and their accessories. Equipment directly connected to color coded pipe shall be painted the same color as the pipe, or as specified in Appendix A – Itemized Painting Schedule.

2. All exposed piping, and appurtenances with associated hardware; including steel, ductile iron pipe, cast iron pipe, plastic, etc.

3. All exposed electrical conduits, brackets, etc. Properly prime galvanized surfaces as specified. Outdoor electrical apparatus and enclosures shall be coated in the same color as adjacent surfaces.

4. New building construction, including interior and exterior concrete masonry walls, all metal doors and frames, all drywall, and exposed wood.

5. All metal equipment and appurtenances not otherwise covered in the previous sections (except aluminum, chrome-plated and stainless items) shall be painted. Submerged items shall be painted black, unless otherwise indicated.

6. All aluminum, stainless steel, and other metal surfaces in contact with dissimilar metals shall be painted at the points of contact according to Appendix B to prevent contact between dissimilar metals. Aluminum in contact with concrete shall be coated per Appendix B to prevent direct metal contact to concrete.

7. All structural steel.

B. Excluded Items: Unless otherwise shown on the Drawings, or specified in other sections, the following is a general list of those surfaces not to be painted on-site or by the manufacturer.

1. Fiberglass Items.

2. Aluminum items, unless otherwise specified.

3. Stainless steel, unless otherwise specified.

4. Chrome Plating.

5. Pre-painted items.
6. Galvanized surfaces, excluding electrical conduits, unless otherwise specified.

C. Itemized Painting Schedule: In addition to the General List of items to be painted above, Appendix A - Itemized Painting Schedule at the end of this Section lists specific items to be painted as part of the Work. This schedule is not intended to be all inclusive, but is provided to indicate major equipment or other items of importance that are to be painted. The schedule does not relieve the Contractor's responsibility to provide a comprehensive list of items to be painted as part of the shop drawing submittal(s).

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Paint: Interior and Exterior
 1. Tnemec Company
 2. AkzoNobel (International Paint, LLC Devco Coatings)
 3. Approved Alternative

2.2 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings.
 1. Process pigments to soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coatings.
 2. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified or commercial quality.
- C. Provide best grade of various types of coatings scheduled as regularly manufactured by acceptable paint manufacturer. Products not displaying manufacturer's identification as "standard, best grade product," are not acceptable.

2.3 FINISH SCHEDULE

- A. This schedule is not intended to include mention of every item requiring field painting, but is intended as a guide to finishing various surfaces throughout the project.
 1. The Finish Schedule in Appendix B at the end of this Section is based, in general, on the products of Tnemec Company and AkzoNobel, and is the basis for standard of quality. The standard "or equal" clause shall apply.
 2. Product substitutions shall be subject to the requirements of Section 01600. Each such request shall include the name of the specified material for which a substitute is being requested; the name of the proposed substitute material; and a complete description of the proposed substitute including performance and test data and any other information necessary for an evaluation.
 3. The burden of proof of the merit of the proposed substitute is upon the Contractor. The decision of the Engineer/Owner regarding approval or disapproval of the proposed substitution shall be final.
 4. Where products are proposed other than those specified by name and number in the Finish Schedule, provide submittal as required including product data sheets and performance criteria along with a new painting schedule in the same format included in this Section.

B. Undercoats:

1. Provide undercoat / primer paint produced by the same manufacturer as the finish coat.
2. Insofar as practicable, use undercoat / primer and finish coat material as part of a unified system of paint finish.

C. Provide all paint and materials supplied by one manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces base conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to the commencement of work.

1. Report all conditions that may adversely affect quality of the finished work prior to commencement of work.
2. Do not commence until such defects have been corrected.

C. Correct defects and deficiencies in surfaces, which may adversely affect work on this Section.

D. Beginning of installation means acceptance of existing surfaces and / or base.

3.2 PREPARATION OF SURFACES

A. Correct minor defects and clean surfaces which impact the work of this section.

B. Impervious Surfaces:

1. Remove mildew by power washing / scrubbing with a solution of trisodium phosphate (TSP) or bleach.
2. Rinse with clean water and allow surfaces to dry.

C. Preparation of Metal Surfaces

1. **SSPC-SP1 SOLVENT CLEANING:** The removal of dirt, oil, grease and foreign matter with solvents or commercial cleaners using various methods of cleaning such as wiping, dipping, steam cleaning or vapor degreasing. The removal of oil and grease by solvent cleaning is included in all other SSPC Surface Preparation Specifications.
2. **SSPC-SP2 HAND TOOL CLEANING:** The removal of loose rust and mill scale, or old paint by hand wire brushing, hand scraping, hand chipping or hand sanding.
3. **SSPC-SP3 POWER TOOL CLEANING:** The removal of loose rust and mill scale by mechanical means such as power sanders, wire brushes, chipping hammers, abrasive grinding wheels or needle guns.
4. **SSPC-SP4 FLAME CLEANING:** The dehydration of the surface by rapidly heating with a high temperature, high-velocity oxyacetylene flame followed by wire brushing and hand scraping to remove loose rust and mill scale.
5. **SSPC-SP5 WHITE METAL BLAST CLEANING:** The complete removal of all visible rust, mill scale, paint and foreign matter by compressed air nozzle blasting, centrifugal wheels or other specified method, leaving an overall, uniformly gray-white metallic appearance.

6. SSPC-SP6 COMMERCIAL BLAST CLEANING: The removal of at least sixty-six percent of all visible rust, mill scale, paint and other foreign matter from each square inch of surface by compressed air nozzle blasting, centrifugal wheels or other specified methods.

7. SSPC-SP7 BRUSH-OFF BLAST CLEANING: The removal of loose rust, mill scale, paint and foreign matter from the surface by compressed air nozzle blasting, centrifugal wheels or other specified methods.

8. SSPC-SP8 PICKLING: The complete removal of all rust, mill scale and foreign matter by chemical reaction or electrolysis in acid solutions. The degree of cleanliness is similar to SSPC-SP5 White Metal Blast Cleaning.

9. SSPC-SP9 WEATHERING AND CLEANING: This is a method of preparing unpainted metal surfaces for coating by weathering metals to remove all or part of mill scale followed by blast cleaning.

10. SSPC-SP10 NEAR-WHITE METAL BLAST CLEANING: The removal of ninety-five percent of all visible rust, mill scale, paint and other foreign materials from each square inch of surface by compressed air nozzle blasting, centrifugal wheels or other specified reason.

11. On galvanized surfaces, prepare in accordance with the methods outlined in ASTM D 6386-99 Standard Practice for Preparation of Zinc (Hot Dipped Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

12. On stainless steel surfaces, prepare by solvent cleaning prior to using any one of the methods in SSPC-SP1. Only solvents or cleaning solutions containing less than two hundred (200) ppm of halogens shall be used to prevent stress corrosion cracking. Abrasive blast cleaning procedures outlined by Steel Structures Painting Council for carbon steel may also be used for stainless steel. Only very hard silica sand or other abrasive material should be used for a fast cutting action and to obtain a sharp angular profile.

D. Shop Primed Steel Surfaces

1. The paint systems shown in appendix B are to be used for equipment and piping delivered to the site even though they may already be shop primed. A shop prime coat shall not be substituted for the surface preparation of prime coats required on-site by the paint systems listed in that Section.

2. Sand or scrape to remove loose primer and rust.

3. Feather edges to form a smooth transition to tight existing paint.

4. Shop Prime Coat: Apply per Finish Schedule in Appendix B at the end of this Section in accordance to the requirements for prime coating.

E. Concrete and Masonry Surfaces

1. All concrete and masonry surfaces to be painted or sealed shall be clean, dry and free of dirt, oils, dust, grease, wax, flaking or loose paint, efflorescence and other deleterious materials. All cracks, chips and other defects in plain concrete and masonry surfaces shall be filled prior to coating or sealing.

2. New concrete or masonry should not be coated for at least twenty-eight (28) days to permit the concrete or mortar to cure and dry out.

3. Prepare concrete or masonry surfaces to be coated in accordance with SSPC SP-13. Surface profile shall be accordance with ICRI CSP standards as recommended by the manufacture based on coating system and the intended environment. The surface of concrete or masonry to be coated should be examined for defects such as fins, protrusions, bulges and mortar spatter. These defects should be corrected by grinding or scraping. Remove non-degraded release agents, oil, wax, and grease by scraping off heavy deposits and solvent cleaning with a hot trisodium phosphate solution. Allow time to dry thoroughly before coating.

F. Cast and Ductile Iron Piping

1. Preparation per NAPF 500 requirements, latest edition.

G. Wood surfaces

1. Wood shall be clean and dry. Remove surface deposits of sap or pitch by scraping and wiping clean with mineral spirits or VM&P naphtha. Seal knots and pitch pockets with shellac reduced with equal parts of shellac thinner (denatured alcohol) before priming. Sand rough areas with the grain, starting with medium grit sandpaper and finishing with fine grit. Remove sanding dust. After prime coat is dry, fill cracks and holes with putty or spackling compound. When filler is hard, sand flush with the surface using fine grit sandpaper. Sand lightly between coats with fine grit, open-coated sandpaper.

H. PVC Pipe

1. All surfaces to be uniformly and thoroughly scarified using a medium grit sandpaper. Any dust or other contaminants remaining after sanding shall be removed with dry, oil free compressed air or by vacuum after cleaning.

I. Gypsum Drywall Construction

1. Sand joint compound with fine-grit, open-coated sandpaper to provide a smooth flat surface. Avoid heavy sanding of the adjacent wallboard surfaces, which will raise the nap of the paper covering. Remove dust from the surface by wiping with clean rags or other means. If additional joint finishing is required to provide a smooth surface, the same joint compound or ready-mixed spackling compound shall be used. Putty, patching pencils, caulking, or masking tape shall not be applied to the drywall surfaces to be painted. Lightly scuff-sand tape joints after priming to remove raised paper nap. Take care not to sand through the prime coat and remove dust by wiping with clean rags.

3.3 PROTECTION

- A. Protect elements surrounding work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.4 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. All painting shall be done in the best manner by skilled workmen and in accordance with the SSPC Good Painting Practices PA1 and the manufacturer's application recommendations. The Contractor shall follow OSH requirements. Extreme care shall be taken around volatile materials, which could pose a fire or explosion hazard. Precautions shall be taken to avoid workmen from inhaling toxic or dangerous vapors or paint particles. Containers for use shall be opened in the presence of the Engineer immediately before use.
- C. Paint shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Where necessary, packaged paint other than cement-emulsion filler may be thinned immediately prior to application in accordance with the manufacturer's directions if authorized by the Engineer, but not in excess of one pint of thinner per gallon of paint.
- D. Surfaces that have been cleaned or pretreated shall be given a first coat of paint as soon as practical after surface preparation, prior to any deterioration of the prepared surfaces.

E. Each coat shall be applied at the rate and to the film thickness specified in Appendix B. One (1) gallon of paint as originally furnished must not cover a greater area than when applied by spray gun than when applied by brush unthinned.

F. All paint shall be thoroughly and smoothly applied or brushed out to a uniform film without runs or sags. Each coat of finish shall be allowed to completely cure and dry hard before application of the succeeding coat. First coats for specific metal surfaces shall be applied by brush, if required by the Engineer. When the trim has been shop primed, any subsequent coats may be applied by brush, roller, or spray. Other surfaces may be coated by brush, roller, or spray, except for filler coats. Sand lightly between coats if required to achieved specific finish.

G. Apply each coat of paint in contrasting color than the preceding coat unless otherwise approved by the Engineer.

H. Metal surfaces adjacent to other surfaces receiving water-based paints shall be primed and/or touched-up prior to the application of the water-based paints. The first coat on plaster shall include touching-up or application of primer-sealer as necessary to produce a uniform color and gloss. Application of styrene-butadiene filler shall be in accordance with the manufacturer's instructions. Surface voids, pores, and cracks shall be filled, and the completed dry film shall be free from pinholes or other imperfections. Surface irregularities need not be completely filled. The coasting material shall not be applied over caulking compound.

I. Paint on metal, masonry, plaster, or concrete areas of considerable size (except floors) may be sprayed by skilled workmen only. Respirators shall be worn by those in proximity of spray painting. The nozzle shall be held perpendicular to the surface being painted and the coat applied uniformly, thoroughly wetted, and properly bonded to the surface. Immediately after spraying, remove all surplus paint and smooth out all runs and sags by brushing out. Adjacent surfaces shall be protected from drips, spatter, and over spray.

3.5 PAINTING EQUIPMENT

A. Brushes shall be new and be the size and type best suited for the particular work. Brushes shall be kept clean and stored properly when not in use. If rollers are used for applying enamel, they shall have a short nap, as required by the manufacturer.

B. Spraying equipment shall be subject to the Engineer's authorization. Compressors shall be motor-driven, oil and water free, and shall be set in locations designated by the Engineer and connected and used without interfering with the work of other trades. The paint spray container shall have an efficient agitator for materials requiring this. All flexible hose, nozzles, and equipment shall be thoroughly cleaned after each day's work and maintained in first-class working conditions.

3.6 FINISHING MECHANICAL EQUIPMENT AND PIPING

A. Finish paint shop primed equipment to color selected.

B. Prime and paint insulated and exposed pipes, hangers, brackets, collars, and supports except where items are prefinished.

C. Replace identification markings on mechanical equipment when painted accidentally.

D. Pipe Color Code

1. All new, exposed, interior, and submerged piping shall be painted. Plastic pipe shall be painted only in order to indicate its use according to the Pipe Color Code, and only that portion which is exposed and not submerged shall be painted. Plastic pipe which is used for purposes other than those mentioned in the Pipe Color Code shall not be painted. In general, the only application for asphalt dipped pipe shall be buried installations. Pipe colors shall be according to the following schedule. The direction of flow of the contents of the pipe shall be stenciled on the piping. Permanently attached plastic markers may be used in lieu of the stenciling. Shop drawings shall indicate stencil or plastic marker method.

2. Water: Color banding and identification of piping (flow arrows, naming, numbering) in accordance with following schedule and the Recommended Standards for Water Works, published by the Great Lakes – Upper Mississippi River Board State Public Health and Environment Managers, latest edition.

a.	Raw water line	Olive
b.	Settled or Clarified water	Aqua
c.	Potable Water	Blue
d.	Alum or Primary Coagulant	Orange
e.	Ammonia	White
f.	Carbon Slurry	Black
g.	Caustic	Yellow w/ green band
h.	Chlorine	Yellow
i.	Fluoride	Light blue w/ red band
j.	Lime Slurry	Light Green
k.	Ozone	Yellow w/ orange band
l.	Phosphates	Light green w / red band
m.	Potassium Permanganate	Violet
n.	Soda Ash	Light green w/ orange band
o.	Sulfuric Acid	Yellow w/ red band
p.	Sulfur Dioxide	Light green w/ yellow band
q.	Backwash Waste	Light brown
r.	Sludge	Dark brown
s.	Sewage (wastewater) line	Gray
t.	Compressed Air line	Green
u.	Gas	Red
v.	Polymers or Coagulant Aids	Orange w/ green band

The contents and direction of flow shall be stenciled on the piping in a contrasting color.

3. Wastewater: Color banding and identification of piping (flow arrows, naming, numbering) in accordance with following schedule and the Recommended Standards for Wastewater Facilities, published by the Great Lakes – Upper Mississippi River Board State Public Health and Environment Managers, latest edition.

a.	Raw Sludge line	Brown w/black bands
b.	Sludge Recirc. Suction line	Brown w/yellow bands

c.	Sludge Draw off line	Brown w/orange bands
d.	Sludge Recirc. Discharge line	Brown
e.	Non-potable water line	Blue w/black bands
f.	Potable Water line	Blue
g.	Sewage (wastewater) line	Gray
h.	Chlorine Line	Yellow
i.	Sulfur Dioxide	Yellow w/red bands
j.	Compressed Air line	Green
k.	Water lines for heating digesters	Blue w/6" band @ 30" spacing
l.	Plumbing drains and vents	Black

The contents and direction of flow shall be stenciled on the piping in a contrasting color.

4. Pipe Lettering Size

<u>Pipe O.D. (inches)</u>	<u>Letter Height (inches)</u>
3/4 to 1-3/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4
8 to 10	2-1/2
Over 10	3-1/2

3.7 CLEANING

- A. As work proceeds, promptly remove paint where spilled, splashed or spattered.
- B. During progress of work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Collect cotton waste, cloths, and materials that constitute a fire hazard; place in closed metal containers and remove daily from site.
- D. Upon completion of work, leave premises neat and clean, to the satisfaction of Engineer.

APPENDIX A - ITEMIZED PAINTED SCHEDULE

<u>A. New Items to be Painted</u>	<u>Color</u>
N/A	

<u>B. Existing Items to Be Painted</u>	<u>Color</u>
N/A	

END OF APPENDIX A

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion	SSPC-SP6	TP2 or IPP1	TI2 or IP11	TF1 or IPF1
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersed	SSPC-SP6	TP2 or IPP1	TI2 or IP11	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersed (2 nd Option)	SSPC-SP6	IPP2	N/A	IPF2
Steel-Structural Tanks, Pipes, Equipment Immersion, Potable Water	SSPC-SP10	TP2 or IPP3	TI5 or N/A (IP)	TF8 or IPF3
Steel-Structural Tanks, Pipes, Equipment Immersion, Non-Potable Water	SSPC-SP10	TP2 or IPP2	TI2 or N/A (IP)	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Below Grade	SSPC-SP10	TP2 or IPP4	N/A	TF5 or IPF4
Factory Primed Steel Exterior Exposed	N/A	N/A	TI4 or IP13	TF1 or IPF1
Factory Primed Steel Interior Exposed	N/A	N/A	TI4 or IP13	TF2 or IPF2
PVC Pipe Exterior Exposed	Scarify	TP1 or IPP1	N/A	TF1 or IPF1
PVC Pipe Interior Exposed	Scarify	TP1 or IPP1	N/A	TF1 or IPF2

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Ductile Iron Pipe Exterior Exposed Non-Immersion	NAPF 500-03-03	TP2 or IPP1	TI2 or IPI3	TF1 or IPF1
Ductile Iron Pipe Interior Exposed Non-Immersion	NAPF 500-03-03	TP2 or IPP1	TI2 or N/A (IP)	TF4 or IPF2
Ductile Iron pipe Immersion Non-Potable Water	NAPF 500-03-03	TP2 or IPP1	TI2 or IPI1	TF4 or IPF2
Ductile Iron Pipe Immersion Potable Water	NAPF 500-03-03	TP2 or IPP5	TI5 or N/A (IP)	TF8 or IPF3
Ductile Iron Pipe Below Grade	NAPF 500-03-03	TP2 or IPP4	N/A	TF5 or IPF4
Galvanized Steel and Non-Ferrous Metals Exterior Exposed	ASTM D 6386- 99	TP1 or IPP1	N/A	TF1 or IPF1
Galvanized Steel and Non-Ferrous Metals Interior Exposed	ASTM D 6386- 99	TP1 or IPP1	N/A	TF2 or IPF2
Galvanized Steel and Non-Ferrous Metals Immersion, Potable Water	ASTM D 6386- 99	TP2 or IPP5	N/A	TF10 or IPF3
Galvanized Steel and Non-Ferrous Metals Immersion, Non-Potable Water	ASTM D 6386- 99	TP1 or IPP1	N/A	TF4 or IPF2
Galvanized Steel and Non-Ferrous Metals Chain Link Fence	ASTM D 6386- 99	TP1 or IPP1	N/A	TF1 or IPF1
Concrete Exterior Exposed	SSPC-SP 13	TP4 or IPP6	TI3 or IPI1	TF7 or IPF5

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Concrete Exterior Exposed Below Grade	SSPC-SP 13	N/A	N/A	TF5 or IPF6
Concrete Immersion Non-Potable Water	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP7	N/A or IPI1	TF4 or IPF2
Concrete Immersion Potable Water	SSPC-SP 13 ICRI-CSP5	TP3 or IPP6	N/A or IPI2	TF10 or IPF3
Concrete Immersion Brine Tank	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP8	TI5 or N/A (IP)	TF12 or IPF7
Concrete Interior Exposed	SSPC-SP 13 ICRI-CSP 1-3	TP3 or IPP2 Patch as required	N/A	TF4 or IPF2
Concrete Secondary Containment Severe Conditions Interior Exposed	SSPC-SP 13 ICRI - CSP 5	TP3 or IPP6	TI6 or IPI4	TF9 or IPF8
Concrete Floors Non-Slip Clear Finish	SSPC-SP 13 ICRI-CSP 3	TP6	N/A	TF10
Concrete Masonry Exterior Exposed	Clean and Dry	TP4 or IPP9	TI3 or IPI1	TF7 or IPF1
Concrete Masonry Interior Exposed	Clean and Dry	TP5 or IPP9	TI2 or IPI1	TF4 or IPF2
Plaster and Wallboard Interior Exposed	Clean and Dry	TP4 or IPP10	N/A	TF3 or IPF9
Wood Interior and Exterior	Clean and Dry	TP4 or IPP11	N/A	TF3 or IPF10

APPENDIX B – FINISHED PAINTED SCHEDULE

<u>Surface</u>	<u>Surface Preparation</u>	<u>Primer</u>	<u>Inter-mediate</u>	<u>Finish</u>
Insulated Pipe Interior	Clean and Dry	TP4 or IPP6	TI7 or IPI5	TF6 or IPF11
Concrete: Severe Wastewater (H ₂ S) Environments	SSPC-SP 13 ICRI-CSP 5	TP3 or IPP8	TI8 or N/A (IP)	TF11 or IPF7
Steel: Severe Wastewater (H ₂ S) Environments	SSPC-SP 5, 3.0 mil minimum profiled	N/A	TF11 or N/A (IP)	TF11 or IPF7
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion – ELEVATED WATER STORAGE TANKS – NEW CONSTRUCTION	SSPC-SP10	IPP12	IPI6	IPF1
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion - ELEVATED WATER STORAGE TANKS – MAINTENANCE & REPAIR (Option 1 – polyurethane)	SSPC-SP7 Min: SSPC- SP2/SP3	IPP13 Spot Prime	IPI6	IPF1
Steel-Structural Tanks, Pipes, Equipment Exterior, Non-Immersion - ELEVATED WATER STORAGE TANKS – MAINTENANCE & REPAIR (Option 2 – acrylic)	Power Wash w/Devprep 88 (min 2000 psi)	IPP13 Spot Prime	IPI5	IPF11

E. Tnemec Prime (TP) Coat:

TP1	Series N69Hi-Build Epoxoline II, 2.0-3.0 mils dry
TP2	Series 1 Omnithane 2.5 – 3.5 mils
TP3	Series 218 MortarClad, min. 1/32"
TP4	Series 151 Elasto-Grip FC, 0.7 – 1.5 mils dry

TP5 Series 130 EnviroCrete, 60 - 80 sq. ft./gal spread rate for porous CMU, 85 to 115 sq. ft./gal. for dense CMU

TP6 Series 201 Epoxoprime

F. Tnemec Intermediate (TI) Coats:

TI1 Series N69 Hi-Build Epoxoline II, 2.0-3.0 mils dry

TI2 Series N69 Hi-Build Epoxoline II, 4.0-6.0 mils dry

TI3 Series 156 EnviroCrete, 4.0-8.0 mils dry

TI4 Series 27 Typoxy, 2.0-3.0 mils dry

TI5 Series 140 Pota-Pox, 4.0-6.0 mils dry

TI6 Series 237SC PowerTread 8.0-10.0 mils dry

TI7 Series 6 Tneme-Cryl, 2.0 - 3.0 mils dry

TI8 Series 434 Perma-Shield H2S, 1/8" min. thickness

G. Tnemec Finish (TF) Coats:

TF1 Series 73 Endura-Shield, 2.0-3.0 mils dry

TF2 Series N69 Hi-Build Epoxoline, 2.0-3.0 mils dry

TF3 Series 113 HB Tneme-Tufcoat, 4.0 - 6.0

TF4 Series N69 Hi-Build Epoxoline II, 4.0-6.0 mils dry

TF5 Series 46H-413 Hi-Build Tneme Tar, 14.0-20.0 mils dry

TF6 Series 6 Tneme-Cryl, 2.0-3.0 mils dry

TF7 Series 156 EnviroCrete, 4.0-8.0 mils dry

TF8 Series N140 Pota-Pox Plus, 4.0 to 6.0 mils dry

TF9 Series 282 Tneme-Glaze, 6.0 - 8.0

TF10 Series 294 Clear CRU 2.0-3.0 mils dry

TF11 Series 435 Perma-Glaze 15.0 - 2.0 mils

H. International Paint (IPP) Prime Coats:

IPP1 Devoe Devran 201H, 2.0-3.0 mils dry

IPP2 Devoe Devran 224HS, 4.0-6.0 mils dry or
International Intergard 345, 4.0-6.0 mils dry

IPP3 Devoe Bar Rust 233H, 4.0-6.0 mils dry or
International Interseal 670HS, 4.0-6.0 mils dry

IPP4 Devoe DevTar 5A-HS, 6.0-8.0 mils dry

IPP5	Devoe Bar Rust 233H, 2.0-3.0 mils dry (thinned) or International Interseal 670HS, 2.0-3.0 mils dry (thinned)
IPP6	Pre-Prime 167, 1.0-1.5 mils dry
IPP7	Devoe Devfil 145
IPP8	Enviroline 50 Moisture Tolerant Primer, 2.0-4.0 mils dry or Ceilcote 680M Primer, 2.0-4.0 mils dry
IPP9	Devoe Bloxfil 4000
IPP10	Devoe Tru-Glaze 4030, 2.0-3.0 mils dry
IPP11	Devoe Devflex 4020
IPP12	Devoe Cathacoat 302H, 2.5-4.0 mils dry or International Interzinc 22, 2.5-4.0 mils dry
IPP13	Devoe Bar Rust 231, Spot Prime or International Intergard 345, Spot Prime

I. International Paint Intermediate (IPI) Coats:

IPI1	Devoe Devran 224HS, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry
IPI2	Devoe Bar Rust 233H, 4.0-6.0 mils dry or International Interseal 670HS, 4.0-6.0 mils dry
IPI3	Devoe Devran 201H, 2.0-3.0 mils dry
IPI4	Devoe Devchem 253, 5.0-6.0 mils dry
IPI5	Devoe Devflex 659, 2.0-3.0 mils dry
IPI6	Devoe Bar Rust 231, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry

J. International Paint Finish (IPF) Coats:

IPF1	Devoe Devthane 379, 2.0-3.0 mils dry or International Interthane 990, 2.0-3.0 mils dry
IPF2	Devran 224HS, 4.0-6.0 mils dry or International Intergard 345, 4.0-6.0 mils dry
IPF3	Devoe Bar Rust 233H, 4.0-6.0 mils dry or International Interseal 670HS, 4.0-6.0 mils dry

IPF4	Devoe DevTar 5A-HS, 6.0-8.0 mils dry
IPF5	Devoe Devthane 378, 2.0-3.0 mils dry or International Interthane 870, 2.0-3.0 mils dry
IPF6	Interzone 954 or Devtar 247, 16.0-20.0 mils dry
IPF7	Enviroline 222, 20.0-100.0 mils dry or Ceilcote 663SG, 60.0-120.0 mils dry
IPF8	Devoe Devchem 258, 5.0-6.0 mils dry
IPF9	Devoe Tru-Glaze 4418, 2.0-3.0 mils dry
IPF10	Devoe Devflex 4216, 2.0-3.0 mils dry
IPF11	Devoe Devflex 659, 2.0-3.0 mils dry

END OF APPENDIX B

END OF SECTION

Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, July 06, 2015 3:50 PM
To: Hansen, Jeff
Cc: Matta, Samir (SFMatta@lan-inc.com); JWGreen@lan-inc.com;
mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com); Prysby, Mike (DEQ)
Subject: Flint WTP GAC Permit Application

Our office received the permit application "Fint WTP Phase II, Segment 3 Filter Media Replacement" on June 30, 2015.

The only specifications provided with the permit application were for the following:

- 05550 Bolts, Anchor Bolts And Expansion Anchors
- 09928 Protective Coating Systems

Aside from information shown on the plan sheets and what was listed in the previously submitted basis of design document, no other specifications were provided regarding:

- GAC and Sand media, including removal, installation, ripening, and disinfection procedures
- Chlorine piping, joints, valves, installation, support, etc.
- Water tight hatch to be installed
- Chlorine gas detector equipment

Regarding the Protective Coating Systems specs and their related appendix, these are general in nature listing every part of the plant as potentially being recoated. Plan notes discuss a few items to be coated/recoated, but it is not entirely clear what the full scope of the coating work will consist of.

We request any additional specification information regarding the above be provided for approval.

It is also noted that the basis of design is based on a flow of 30 MGD, approximately 2.5 gpm/ft² filter loading rate. The existing filters are currently rated for 36 MGD at 3 gpm/ft². This would cause the WTP capacity rating to be lowered to 30 MGD. Any future request to expand filter capacity back to 36 MGD would need to be demonstrated through filter performance testing.

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

Rennaker, Joanne (DEQ)

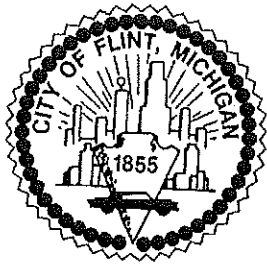
From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Wednesday, July 01, 2015 8:07 AM
To: Prysby, Mike (DEQ)
Cc: Busch, Stephen (DEQ); Rosenthal, Adam (DEQ)
Subject: LT2 Plan
Attachments: LT2 Plan.pdf

Mike,

Here is a copy of The City of Flint Water Treatment Plant LT2 Monitoring Plan. Brent should have sent a hard copy out on Monday the 29th after we had determined the source identification number for the Flint River (IN001).

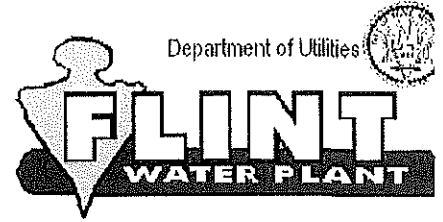
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Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Supervisor

June 26, 2015

Michael Prysby
District Engineer
Office of Drinking Water and
Municipal Assistance

Re: LT2 Source Water Sampling Plan.

Dear: Mr. Prysby,

Enclosed with this letter is a copy of the City of Flint Water Treatment Plant LT2 sampling plan. The City of Flint Water Plant will be utilizing the Michigan State University Environmental and Molecular Microbiology Laboratory for cryptosporidium testing. The City of Flint Water Plant Laboratory will conduct *E.coli* and turbidity testing. Currently, the Water Plant Laboratory conducts source water testing daily for both *E. coli* and turbidity, and is certified in the enumeration of *E. coli*. The sample location submitted is a source water tap in Pump Station #4, which is located after the intake pumps, prior to filter backwash addition and ozone treatment. Schematic #1 that was provided, best represents the treatment plant and is included with the sampling plan. Recycling of filter backwash has not occurred since the commencement of full time operation, however the Water Plant does have the capability, and will look to utilize it in the future. If you have any questions or concerns, contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant WSSN: 2310
Laboratory & Water Quality Supervisor
(810) 787-6537 ext. 3512
Mglasgow@cityofflint.com

City of Flint Water Treatment Plant

WSSN: 2310

Long Term 2 (LT2) Source Water Sampling Plan

October 2015 – September 2017

SAMPLING SCHEDULE:

- ONE SOURCE WATER SAMPLE COLLECTED MONTHLY FOR 24 MONTHS.
- COLLECTION OF SAMPLES BEGINING IN OCTOBER 2015 AND ENDING IN SEPTEMBER 2017.
- SAMPLES COLLECTED FROM SOURCE WATER TAP LOCATED IN BASEMENT OF PUMP STATION #4.

<u>2015</u>	<u>2016</u>	<u>2017</u>
10/7/2015	1/6/2016	1/11/2017
11/4/2015	2/3/2016	2/8/2017
12/9/2015	3/9/2016	3/8/2017
	4/13/2016	4/5/2017
	5/4/2016	5/3/2017
	6/8/2016	6/7/2017
	7/20/2016	7/5/2017
	8/3/2016	8/9/2017
	9/21/2016	9/13/2017
	10/5/2016	
	11/16/2016	
	12/7/2016	

LABORATORIES & TESTING:Cryptosporidium analysis:

MICHIGAN STATE UNIVERSITY
 ENVIRONMENTAL & MOLECULAR MICROBIOLOGY LABORATORY
 480 WILSON RD. 3 NATURAL RESOURCES BUILDING
 EAST LANSING, MI 48824
 MICHIGAN LABORATORY ID# 9982

E. coli & Turbidity analysis:

CITY of FLINT WATER PLANT LABORATORY
 4500 N. DORT HWY
 FLINT, MI 48505
 MICHIGAN LABORATORY ID# 2310

Long Term 2 Enhanced Surface Water Treatment Rule Source Water Sampling Location Worksheet

Public Water System (PWS) Name: CITY OF FLINT WSSN: 2310

Water Treatment Plant Name: _____

Water Treatment Plant ID: _____

Name and Phone Number of Person completing this Form: MIKE GRASGOW (810) 787-6537

Source Name	<u>FLINT RIVER</u>	
Source Type Flowing Stream Lake/Reservoir GWUDI - Ground Water Under the Influence of Surface Water	<u>FLOWING STREAM</u>	
Source Identification Number		
Source Water Sampling Location (Raw water tap or sampled at source, indicate location on schematic)	<u>RAW WATER TAP</u>	
Usage Operational – almost all the time Demand – a few times a year Emergency – fewer than once per year	<u>OPERATIONAL</u>	
Proportion of Typical Average Daily Flow (if only 1 source, 100%)	<u>100</u> %	<u> </u> %
Pretreatment Practices (if applicable) None Presedimentation Bank filtration Other – write in	<u>NONE</u>	
Recycling Practices (yes or no) (If yes, describe and indicate location on schematic)	<u>YES - FILTER BACKWASH</u>	
Chemical Pretreatment (yes or no) (If yes, describe and indicate location on schematic)	<u>NO</u>	
Compositing Procedure (yes or no) (If yes, state if using blended sample tap, composite sample, or weighted)	<u>NO</u>	

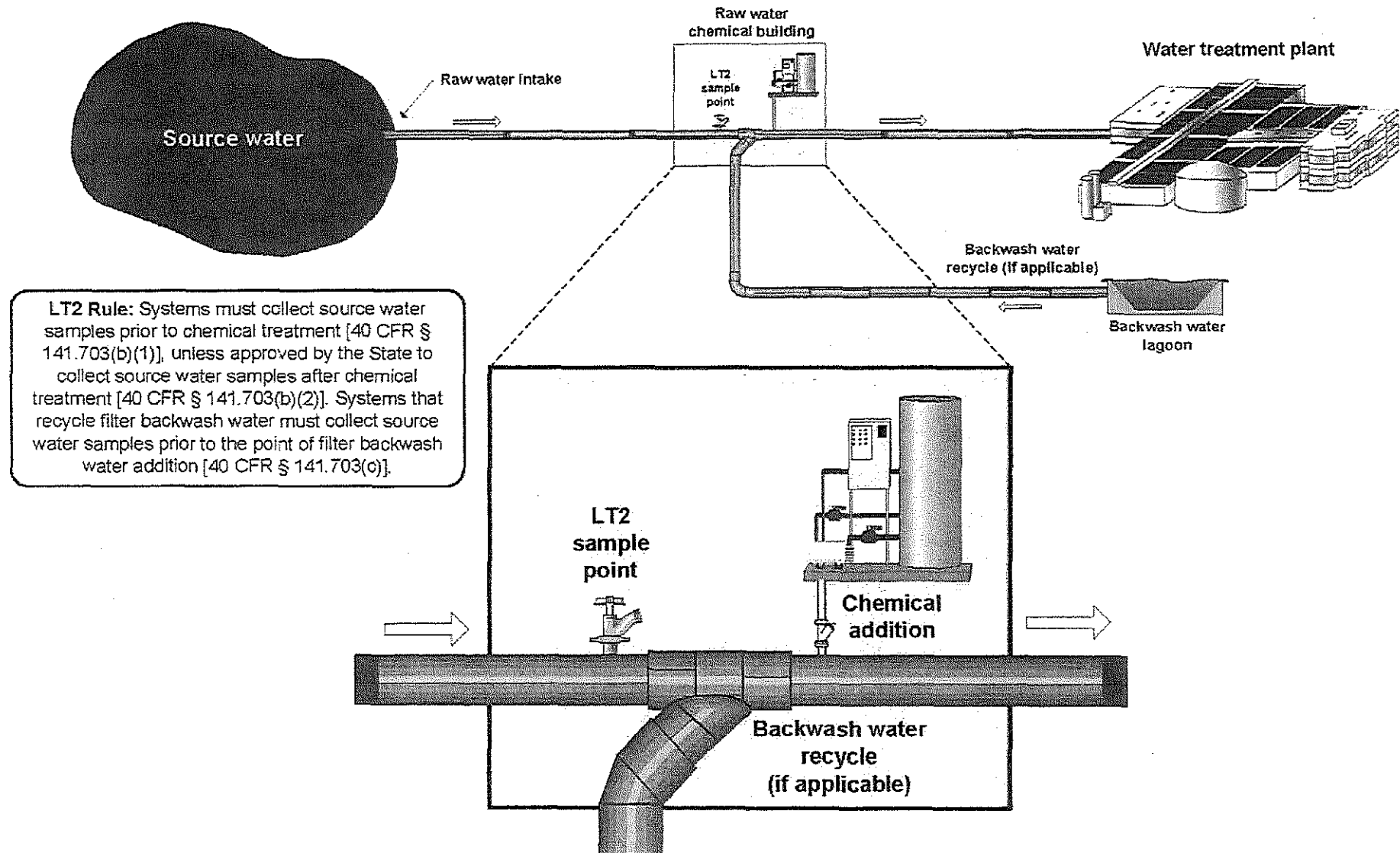
Use additional sheets to provide more information.

I acknowledge that water system staff will notify the DEQ immediately upon discovery of any issues related to timely source water sample collection or accurate lab analysis of samples.

Michael Glasgow
Signature

6/26/15
Date

Figure 1. Sample Tap before Chemical Treatment and Backwash Water Recycle (if applicable)



Rennaker, Joanne (DEQ)

From: Busch, Stephen (DEQ)
Sent: Monday, June 29, 2015 3:54 PM
To: Crooks, Jennifer; Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ)
Subject: RE: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

Jennifer,

Mike has been out and won't likely return until next Monday 7/6. I have not been in touch with the City on this yet. The City's Pb/Cu monitoring period ends tomorrow 6/30, so by 7/10 we should also have a better idea where the City stands.

As you saw from the June 9, TTHM MCL VN, only one compliance sample (out of 24) in the last 9 months exceeded 80 ppb (Site DBP4, 94 ppb, 11/20/14).

TOC removal has been effective at the WTP, and with the upcoming GAC filter media changeout should be even more effective.

Total Coliform has not been an issue for the last 9 months, since September 2014, and work on the distribution system has improved chlorine residuals (with additional transmission main work planned over the next couple of years).

So at this point I don't think we have any questions.

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

From: Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]
Sent: Friday, June 26, 2015 5:41 PM
To: Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)
Cc: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ)
Subject: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

Steve and Mike; referring to the bios I sent you all last Monday, 6/22, of Mike Schock and Darren Lytle, I was wondering if you've had a chance to discuss Mike and Darren's participation in evaluating treatment/water quality/lead levels with the City of Flint?

Perhaps I can answer any questions you might have about their participation with you all?

Jennifer

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Monday, June 29, 2015 10:31 AM
To: Mike Glasgow
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ); 'bwright@cityofflint.com'
Subject: FW: 6/30 & 7/1/15 deadlines

Morning Mike, per the central office, use IN001 for the Source ID.

thanks,

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

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

From: Cook, Pat (DEQ)
Sent: Monday, June 29, 2015 10:28 AM
To: Rosenthal, Adam (DEQ)
Subject: RE: 6/30 & 7/1/15 deadlines

Yea, that's not real clear. Other supplies are using the intake number noted in SDWIS. For Flint have them use IN001.

pat

Rennaker, Joanne (DEQ)

From: Michael Glasgow <mglasgow@cityofflint.com>
Sent: Friday, June 26, 2015 4:46 PM
To: Rosenthal, Adam (DEQ)
Cc: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Brent Wright
Subject: Re: 6/30 & 7/1/15 deadlines

Adam,

Just a quick question on the LT2 worksheet. What is the source identification number for the Flint River?

On Thu, Jun 25, 2015 at 10:47 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike & Brent, just wanted to remind you/confirm that Flint is on track for a few items.

1 – We hope you have 61 more lead/copper samples collected and sent to the lab by 6/30/15, and that they are will be below the AL for lead. As of now with 39 results, Flint's 90th percentile is over the AL for lead.

2 – LT2 source water monitoring plan, reminder that it is due to our office for review by 7/1/15 per Mike's 4/3/15 letter, (attached).

3 – Consumer Confidence Report, (CCR), has not been received yet – due to our office, Gen. Co. LHD & your customers by 7/1/15.

Please provide an update for the above items.

thanks,

Adam Rosenthal, EQA

MDEQ – Office of Drinking Water and Municipal Assistance

Lansing District – Constitution Hall 1SW

PO Box 30242

Lansing, MI 48909

517-284-6644

fax: 517-241-3571

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

--

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

Rennaker, Joanne (DEQ)

From: gdn2@aol.com
Sent: Friday, June 26, 2015 3:51 PM
To: hcroft@cityofflint.com; dr.laura2@gmail.com
Cc: bwright@cityofflint.com; dwalling@cityofflint.com; donna.cole@genesys.org; gambrose@cityofflint.com; jhenry@gchd.us; jllorenz@cityofflint.com; jmikewright@yahoo.com; jherman@genesys.org; jfobrien@gcdcwws.com; ksmith@flint.org; larry.koehler@mcc.edu; mglasgow@cityofflint.com; Wright.Michael@epa.gov; mjlane@umflint.edu; Prysby, Mike (DEQ); nhenderson@cityofflint.com; nbirchm1@hurleymc.com; plevine@gcms.org; rbincsik@cityofflint.com; rosejo@msu.edu; Russell.Hudson@mclaren.org; SFMatta@lan-inc.com; jwgreen@lan-inc.com; mike49@sargentstitle.com
Subject: Re: Water Quality Update

Howard,

Is the Activated Carbon Filter the last stage in the system of treatment? If not, can or will chlorine be added to the water after that stage?

Best,

G. Natzke

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

From: Howard Croft
To: Laura Sullivan
Cc: Brent Wright ; Dayne Walling ; donna. cole ; gdn2 ; Gerald Ambrose ; Howard Croft ; James Henry ; Jason Lorenz ; jmikewright ; JoAnne Herman ; John O'Brien ; Kirk Smith ; larry.koehler ; Michael Glasgow ; Michael Wright ; Mike Lane ; Mike Prysby (DEQ) ; Natasha Henderson ; Norb Birchmeier ; Pete Levine ; Robert Bincsik ; rosejo ; Russell Hudson ; Samir Matta ; Warren Green ; Michael Sargent
Sent: Fri, Jun 26, 2015 2:41 pm
Subject: Re: Water Quality Update

As a follow up to this afternoon's email, I am answering several questions that have subsequently been asked.

The vendor is " Calgon Carbon" with headquarters in Pennsylvania. They are both the supplier of the material and the installer as well. After initial designs were approved by the DEQ, various water samples from the Flint River were drawn and sent to Calgon for two weeks of testing under various conditions to try and gauge the effectiveness of the specific carbon filters chosen. Flow rate and temperature tests were performed by our engineering firm LAN at the water plant prior to the design being developed and forwarded to the DEQ. The filter media is Granulated Activated Carbon and the first filters are scheduled for installation to begin following the 4th of July weekend.

Please forward me any additional questions that may arise.

Thank you,

On Fri, Jun 26, 2015 at 3:25 PM, Laura Sullivan <dr.laura2@gmail.com> wrote:
Hello Howard,

Could you provide the following information to the team?

You refer to a vendor - is this the supplier of the new filter media? Testing the efficacy of the media should not be conducted by the vendor.

What tests have been conducted and under what circumstances (flow rate, temperature)? From what location was the water used in these tests collected?

What is the identity of the filter media? Is it GAC?

Yours truly,
L Sullivan

On Friday, June 26, 2015, Howard Croft <hcroft@cityofflint.com> wrote:

Technical Team,

I am writing to provide you an update on the City's ongoing plan to improve the water quality in the City of Flint.

This morning, the U of M Flint announced that recent testing showed TTHM levels slightly above the MCL in two of its buildings. The City responded to this recent information of concern with increased flushing in the area where subsequent internal tests have shown the levels to have subsided to under than 80 ppb.

The TTHM level leaving the water plant is currently in the 45 -55 ppb range and in areas with minimal circulation the level can rise by the time it reaches a tap.

The installation of new filter media at the water plant which is designed to greatly reduce the TTHM level in the plant is ahead of schedule and is expected to be installed by mid-July. The DEQ has approved the design and actual testing by the vendor over the past two weeks has verified that the selected media should work. **This is expected to have an immediate impact on TTHM levels.**

In addition to the filter installation, we have engaged in increased valve exercising over the last two months and have checked over half of the 7,000 valves in the system. The valve turning has a tendency to result in temporary water discoloration but increases the overall water circulation and identifies areas where valves are inoperable.

Our annual Consumer Confidence Report will be distributed in early July and will contain significant information about the water system. We will also include the notice of our recent quarterly testing in which all eight sites were verified to be under the MCL but the running average at one site required a notice to be sent.

I will email everyone when we schedule the next TAC team meeting which we have currently targeted for mid-August.

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com

--

Laura L. Sullivan, Ph. D.

3101 Hawthorne Drive

Flint, Michigan 48503

dr.laura2@gmail.com

Human(kind). Be both.

--

Howard Croft

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

hcroft@cityofflint.com